

Maplin

*1986 Buyer's Guide
to Electronic Components*

World Back to History

LOWEST EVER PRICES
SEE INSIDE NOW
£1.45

OVER 3000 PRICES REDUCED

Dear Customer,

It's not often than I'm able to write to anyone with such good news as this. Over 3000 prices reduced - and on a lot of the items by substantial amounts as well! But let me reassure everyone that we haven't reduced the quality of our products or the quality of our service to achieve these amazing reductions.

All our goods are still to the same high standard you've been used to, and indeed we shall still be striving to improve even on that. Our service will still be one of the fastest in the country with every order despatched on the day we receive it, on all but a handful of days each year.

In fact our service should be even better! Our new stock control system should greatly improve our ability to spot unusually fast moving lines earlier and get new stock in before we run out of the old. So our stock levels will be even better than before.

We've been able to reduce our prices on mail-order, so that they are now lower in real terms than ever before. The price you see in this Catalogue will be the price charged on mail-order and in our shops. If you order by post we will ask you to pay just 50p on every order to go towards the cost of carriage and packing.

And what an incredible bargain this is. Shop prices, without the expense of travelling to or parking near High Street stores - in my town the cost of parking alone is over 50p. Of course Maplin shops (where the parking is usually free or at least low cost, because we're not actually in High Street positions) will still

offer the personal service, a chance to look at our product range at your leisure, make your choice and walk out of the door with it.

But for those of you who have to, or choose to use mail-order, this new deal from Maplin is going to be a real money-saver for you. We tested dozens of orders with our new prices and on almost every one, the overall price you will pay including the new 50p charge is less than you would have paid with our old prices.

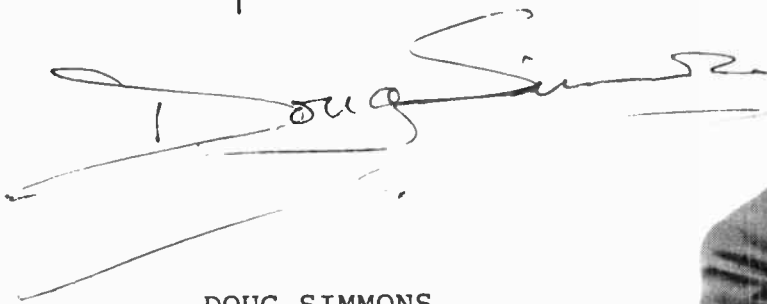
So please compare our new prices with our competitors'. But don't get caught in the VAT trap! Most of our competitors show VAT exclusive prices, whereas our prices always include VAT. Don't forget that on an item where we charge as little as 8p inclusive, a competitor charging 7p exclusive is actually dearer than we are! So even if our prices look the same as the competition, remember: we're actually much cheaper!

And it's a much fairer system too. With Maplin prices, the price you see is the price you pay!

It's all part of a great New Deal from Maplin - with our new look to remind you that we're even better and even more competitive than before.

I'm delighted to be able to write in all honesty; order now - and save!

Yours sincerely,



DOUG SIMMONS
JOINT MANAGING DIRECTOR



PS If you don't want the bother of comparing prices, don't worry. We've already checked them all out, and we're certain that overall you'll find Maplin has the best service and the best prices, so that you can order with confidence.

MAPLIN'S 5 REGIONAL SHOPS

HELP SERVE YOU BETTER!

Birmingham: Lynton Square, Perry Bar. Tel: 021 356 7292.

London: 159-161 King Street, Hammersmith W6. Tel: 01 748 0926.

Manchester: 8 Oxford Road. Tel: 061 236 0281.

Southampton: 46-48 Bevois Valley Road. Tel: 0703 225831.

Southend-on-Sea: 282-284 London Road, Westcliff-on-Sea, Essex.

Tel: Southend-on-Sea (0702) 554000.



Before you send your next order to us by post, take a look and see if there's a Maplin shop near you. In our shops you'll find that personal service that even the best mail-order operations cannot match. And you can look at the products before you buy. If you're coming for a particular item, a quick phone call will enable you to be certain the shop has everything you want in stock.

Our shops are pleased to accept Access, Barclaycard, American Express and Mapcard, and also cheques up to £50 with a cheque guarantee card. We'll even accept ordinary money as well!

All our shops are close to excellent parking facilities, meters in London and Manchester, and free elsewhere.

The South

In the South our Southampton store is conveniently placed for easy access from all parts of Hampshire and surrounding counties and is just 15 minutes from Portsmouth.

London

Our London store situated just to the west of the pedestrian shopping centre in Hammersmith, is just 5 minutes from the end of the M4 and only a short walk from the

District, Piccadilly and Metropolitan lines' Hammersmith station.

The Midlands

In the Midlands our Birmingham store is just 5 minutes from the M6 on the A34, and only a little farther from the M5 (junction 1) on the A4040.

The North

Our self-service store in Manchester serves the North and is just off the Mancunian Way opposite the BBC, about 5 minutes from the end of the M602 or junction 10 on the M63.

South-East

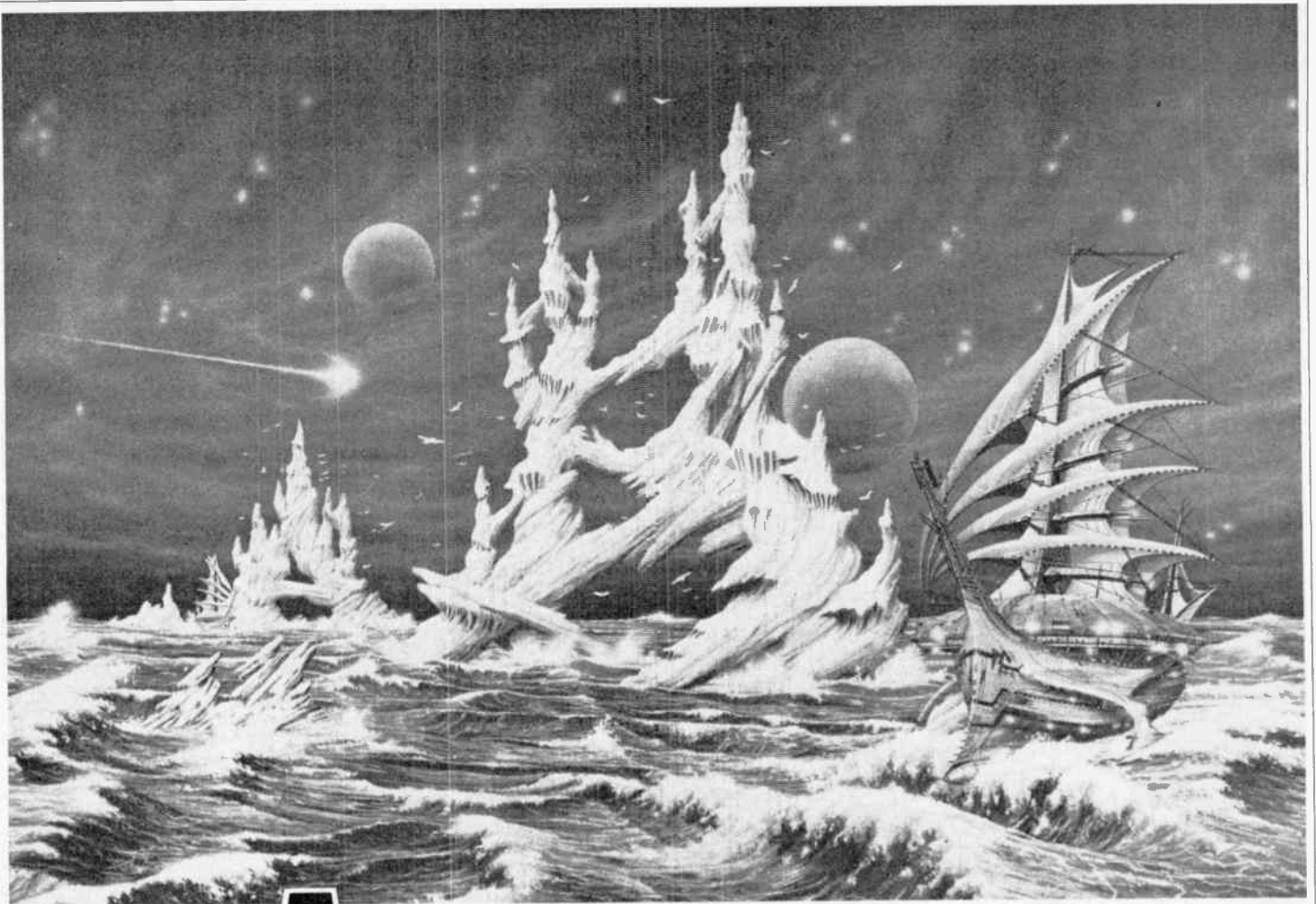
Essex and Kent are served by our

Southend shop which is right on the A13, just 2 minutes before you reach the centre of Southend. And we're only 30 minutes from the M25 (junction 29) as well.

All our shops are open from 9 a.m. to 5.30 p.m. Tuesday to Saturday (closed all day Sunday and Monday) and do not close for lunch.

There's a friendly welcome in store for you at any Maplin shop. Our helpful staff may often be able to help with a technical problem or a constructional difficulty.

Call in at a Maplin store and get what you want today. We look forward to serving you.



After a long journey across the wind-whipped seas of Heberoth IV, the Hebor's finally bring their giant ship to the ice-palaces near the planet's equator. This is the only means of approach to these icy pinnacles. Famous across the galaxy, they are the coldest permanent cities of mankind anywhere in the universe and are captured here, in brilliant realism by galaxy-famous artist Duncan Macaulay.

Here everything is cold. A little further to the north or south, the seas themselves are frozen, and giant cities stand among the glaciers. Yet even here mankind has found a way to gather the resources of the universe for the benefit of all, though in return they are totally dependent on the vital supplies brought from neighbouring worlds and across the galaxy by the giant space-freighters.

Sprinkled like grains of sand among the stars are the outposts of mankind; drawn together over the unimaginable distances by the giant trading fleets that cross and re-cross the galaxy. They bring free trade and the warmth of human fellowship to these distant worlds, in the great tradition of the traders who crossed the seas of old Earth, at the very dawn of history.

Maplin: the way to the future.

MAPLIN ELECTRONIC SUPPLIES LTD.

P.O. Box 3, Rayleigh, Essex, SS6 8LR.

Telephone: Southend-on-Sea (0702) 554155. Telex: 995695.

Sales only: Southend-on-Sea (0702) 552911.

Trade Sales: Southend-on-Sea (0702) 552961.

Cashtel: Southend-on-Sea (0702) 552941.

Office hours 9 a.m. to 12.30 p.m. and 1 p.m. to 4.30 p.m. Monday to Friday.

Sales desk open 9 a.m. to 5.30 p.m. Monday to Friday.

For personal service, visit our shops at:

159-161 King Street, Hammersmith, London W6. Telephone: 01-748 0926.

8 Oxford Road, Manchester. Telephone: 061-236 0281.

Lynton Square, Perry Barr, Birmingham. Telephone: 021-356 7292.

282-284 London Road, Westcliff-on-Sea, Essex. Telephone: Southend-on-Sea (0702) 554000.

46-48 Bevois Valley Road, Southampton. Telephone: (0703) 225831.

Shop opening hours: 9 a.m. to 5.30 p.m. Tuesday to Saturday.

All shops closed all day Monday. All mail to P.O. Box 3, Rayleigh, Essex.

THE
MAPLIN
TEAM



Ingrid



Debbie



Pat



Gladys



Sandra



Chris



Karen



Lorna



Barbara



June



Gladys



Joie



Hazel



Jill



Amanda



Carol



Barbara



Brenda



Hilda



Hazel



John



Viv



Hazel



Joanne



Ron



John



Angela



Paul



Michael



Paul



Irene



Lesley



Michael



Nigel



Roger



Dave



Joyce



Gwen



Diane



Brenda



Rose



Eileen



Kathy



Eileen



Peter



June



Chris



Eileen H.



Sylvia



Roy



Jo



Mary



Tracy



Carol



Doug



Sandra



Eddie



John



Ann



Lewis



Robert



Dave



Greg



Carol



Sheila



Lizzy



Chris



Mark



Gillan



Peggy



Michael



Maureen



Wayne



Alan



Maureen



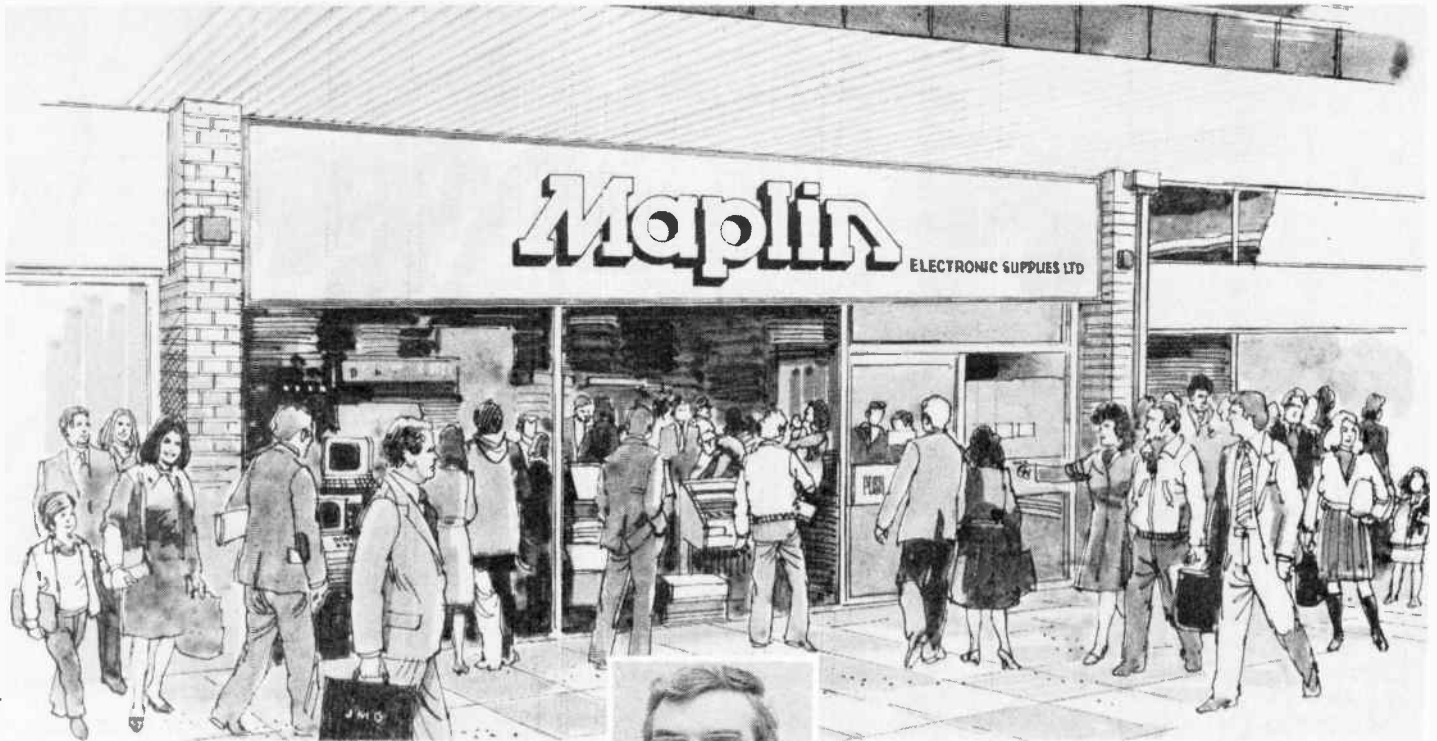
Maureen



Sue



Jeanette



Lynton Square, Perry Barr, Birmingham.
Tel: 021-356 7292.
Opening hours: 9 to 5.30.
Tuesday to Saturday.
Closed all day Monday.

Our Birmingham store is located in the pedestrian shopping precinct at the junction of the A34 and A4040, opposite Birmingham Polytechnic. We're just 5 minutes from the M6 on the A34, and only a little farther from the M5 (junction 1) on the A4040. There is a very large free car park directly beneath the shop.



Dave



Roy

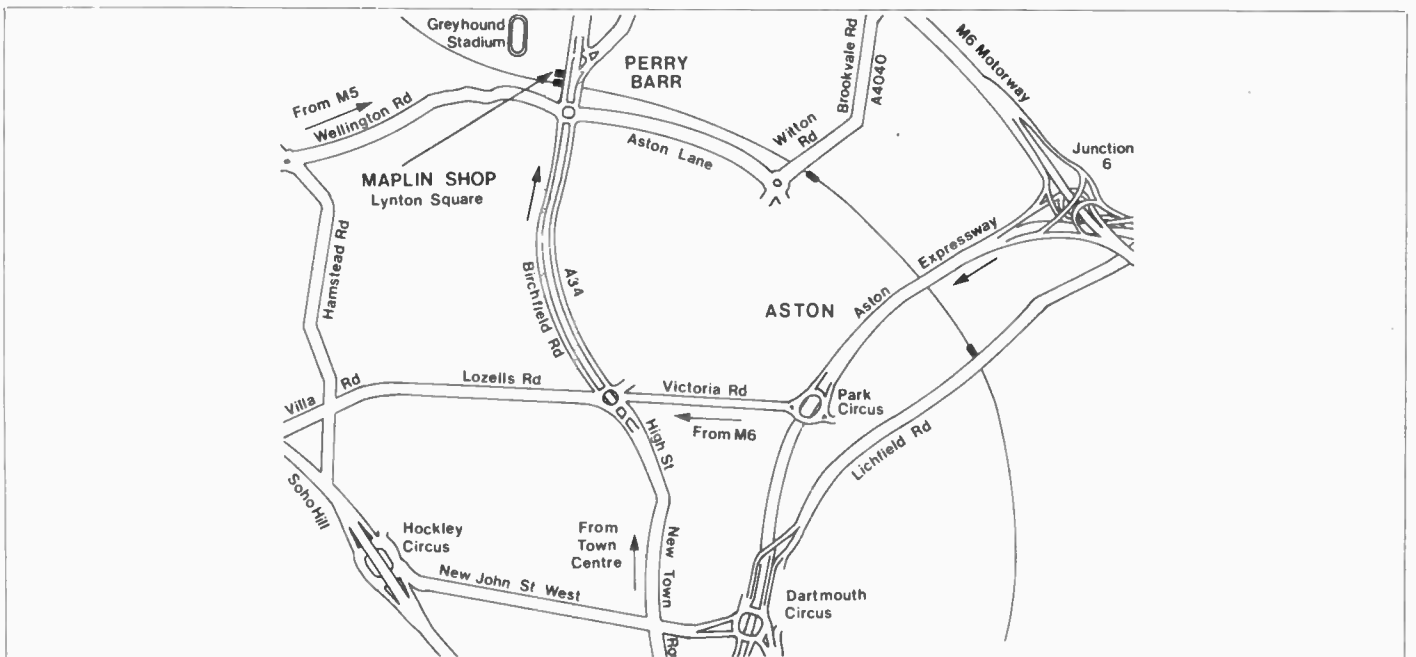


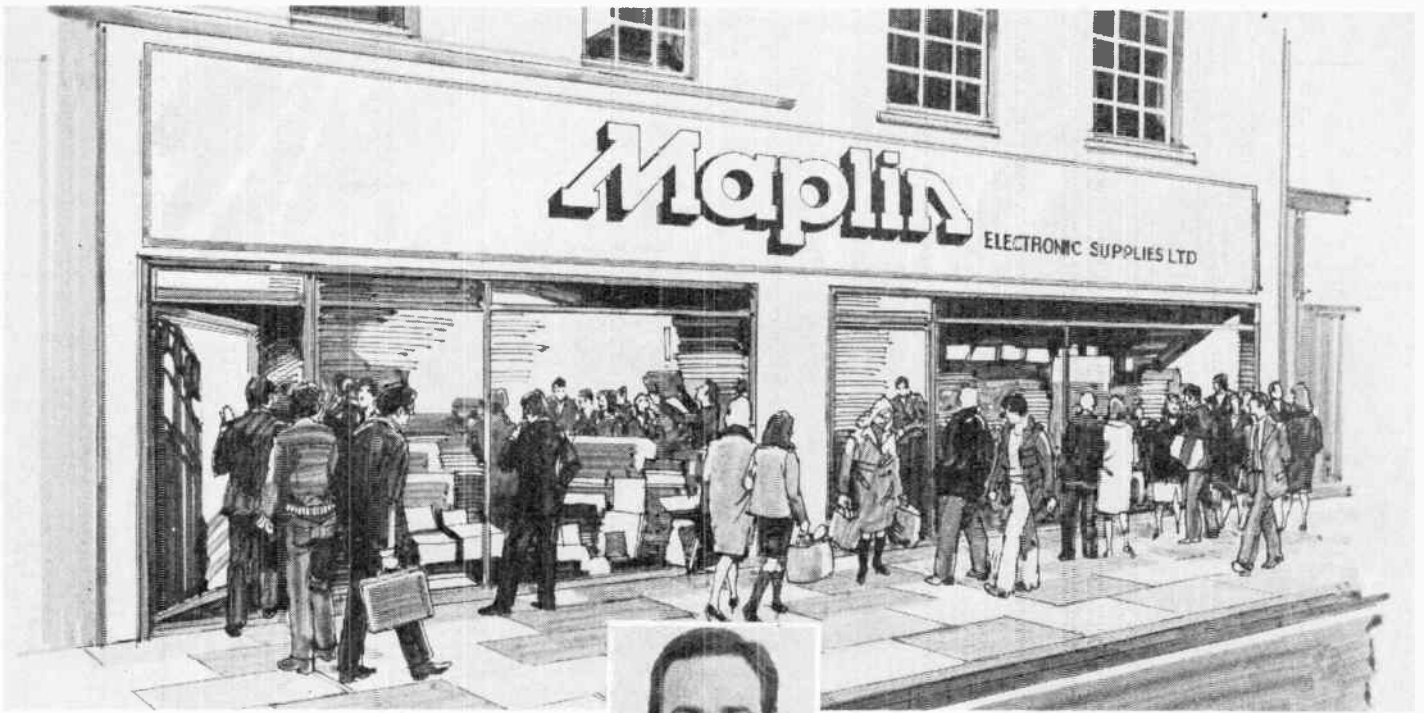
Bob



Rob

Our shops accept Access, Barclaycard, American Express and Mapcard, and cheques up to £50 with a cheque guarantee card. If you bring lists of components you require, it will help us to serve you more quickly, if you use descriptions rather than just order codes, and group similar components together in value order. If you're coming for a particular item, a quick phone call will enable you to be certain we have everything you want in stock. We look forward to serving you.





159-161 King Street,
Hammersmith, London W6.
Tel: 01-748 0926.
Opening hours: 9 to 5.30.
Tuesday to Saturday.
Closed all day Monday.

Situated just to the west of the pedestrian shopping centre in Hammersmith, our London store is in easy walking distance of Hammersmith Underground Station, for District, Piccadilly and Metropolitan lines. Buses No. 27, 91, 260, 267, 290 and 704 stop right outside the door. By car we're just 2 miles from the end of the M4. Continue straight along the Great West Road, turning left just before the Hammersmith flyover. On



Peter



Martin



Paul

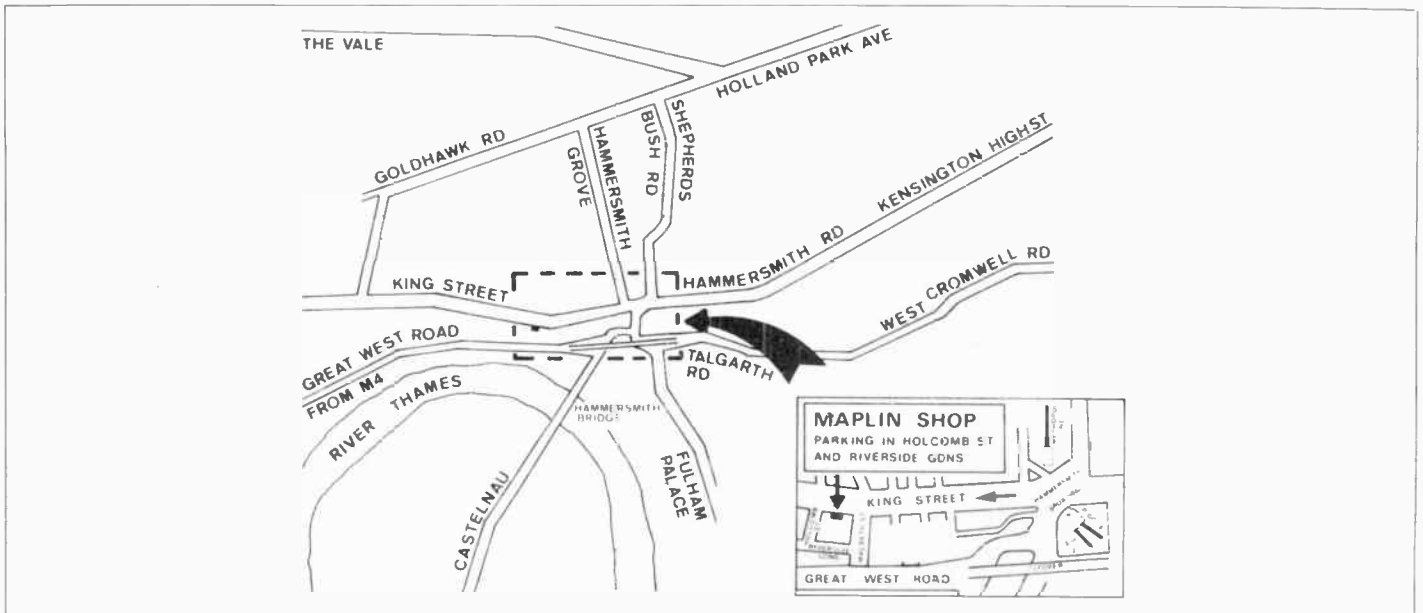


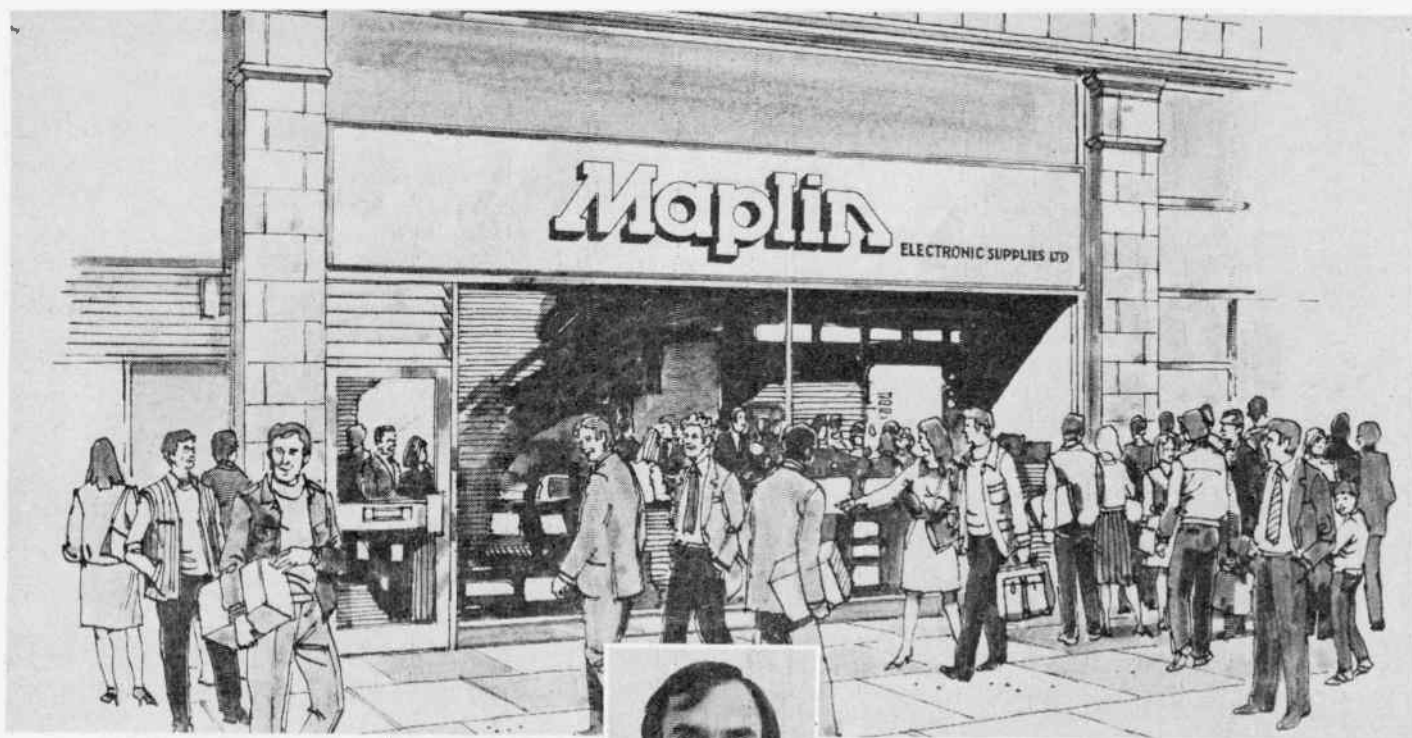
Melvyn



Karen

the roundabout, take the first left and then continue along King St. until you reach Holcomb St. where you will find plenty of metered parking. Our shops accept Access, Barclaycard, American Express and Mapcard, and cheques up to £50 with a cheque guarantee card. If you bring lists of components you require, it will help us to serve you more quickly, if you use descriptions rather than just order codes, and group similar components together in value order. If you're coming for a particular item, a quick phone call will enable you to be certain we have everything you want in stock. We look forward to serving you.





8 Oxford Road, Manchester.
 Tel: 061-236 0281.
 Opening hours: 9 to 5.30.
 Tuesday to Saturday.
 Closed all day Monday.

Our Manchester store is directly opposite the BBC, just off the Mancunian Way, between Piccadilly and the University complex. We're just a few steps from Oxford Road Station, or by car, about 5 minutes from the end of the M602 or junction 10 on the M63. There is a large NCP car park just behind the shop, or plenty of meters in side roads all around. This store features a self-service area where you



Tim



Keith



Bob

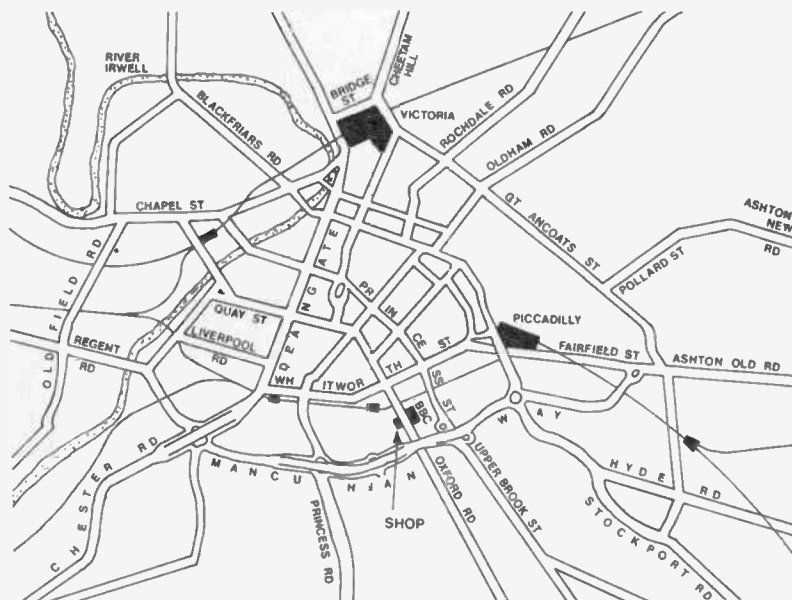


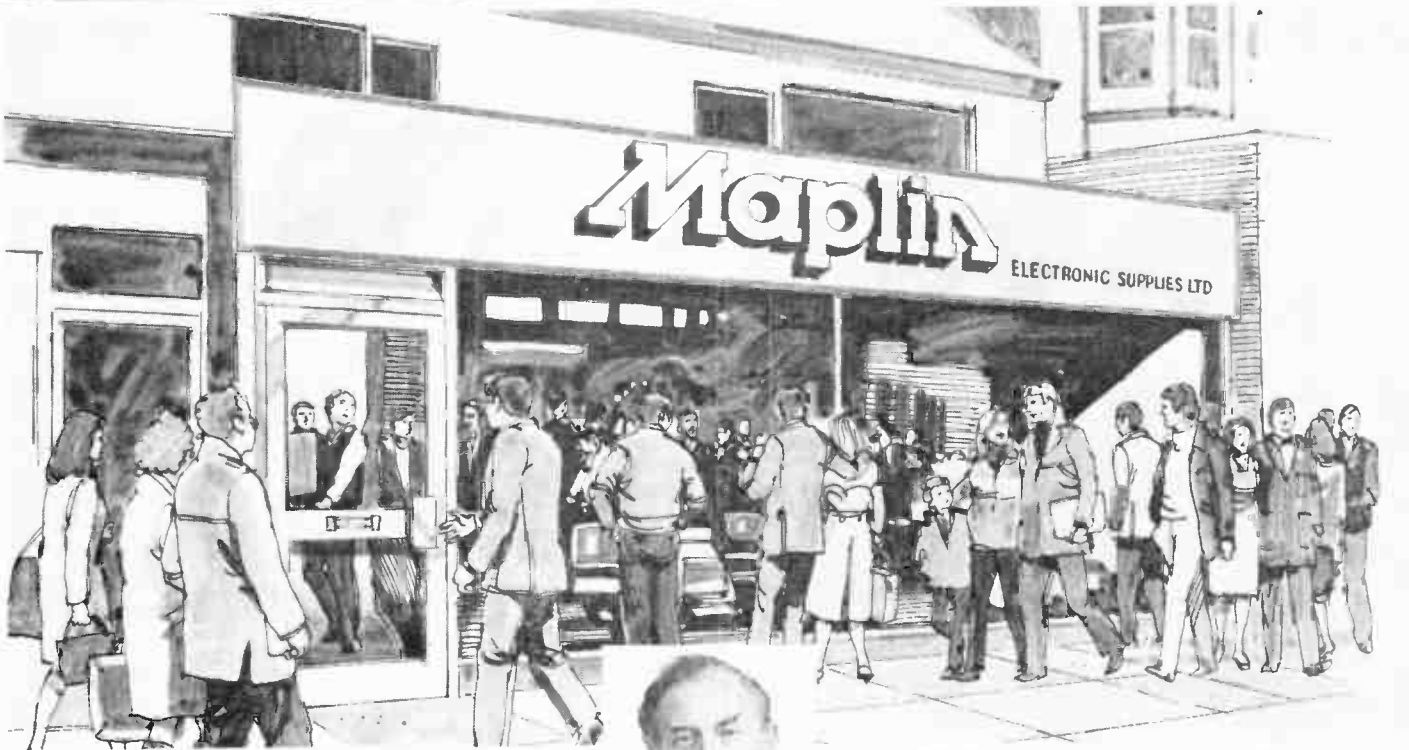
Gavin



Keith

can browse through our large range, whilst counter service is available as well. Our shops accept Access, Barclaycard, American Express and Mapcard, and cheques up to £50 with a cheque guarantee card. If you bring lists of components you require, it will help us to serve you more quickly, if you use descriptions rather than just order codes, and group similar components together in value order. If you're coming for a particular item, a quick phone call will enable you to be certain we have everything you want in stock. We look forward to serving you.





46-48 Bevois Valley Road,
Southampton.
Tel: (0703) 225831.
Opening hours: 9 to 5.30.
Tuesday to Saturday.
Closed all day Monday.

Situated in the Bevois Valley area in Southampton, we are conveniently placed for easy access from all parts of Hampshire and surrounding counties and just 15 minutes from Portsmouth. From Portsmouth use the A27 to the TV South studios. Turn immediately right at the traffic signals, follow the road directions through side roads, through the railway crossing



Michael



Ken



Bob

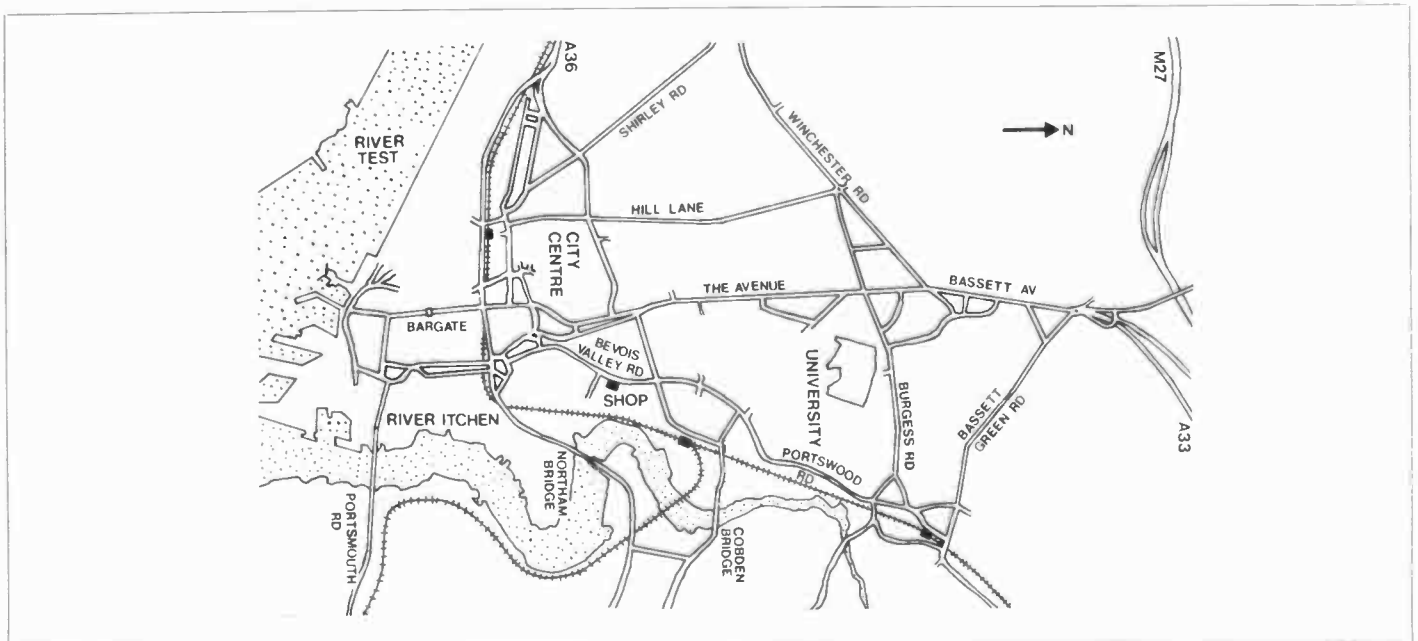


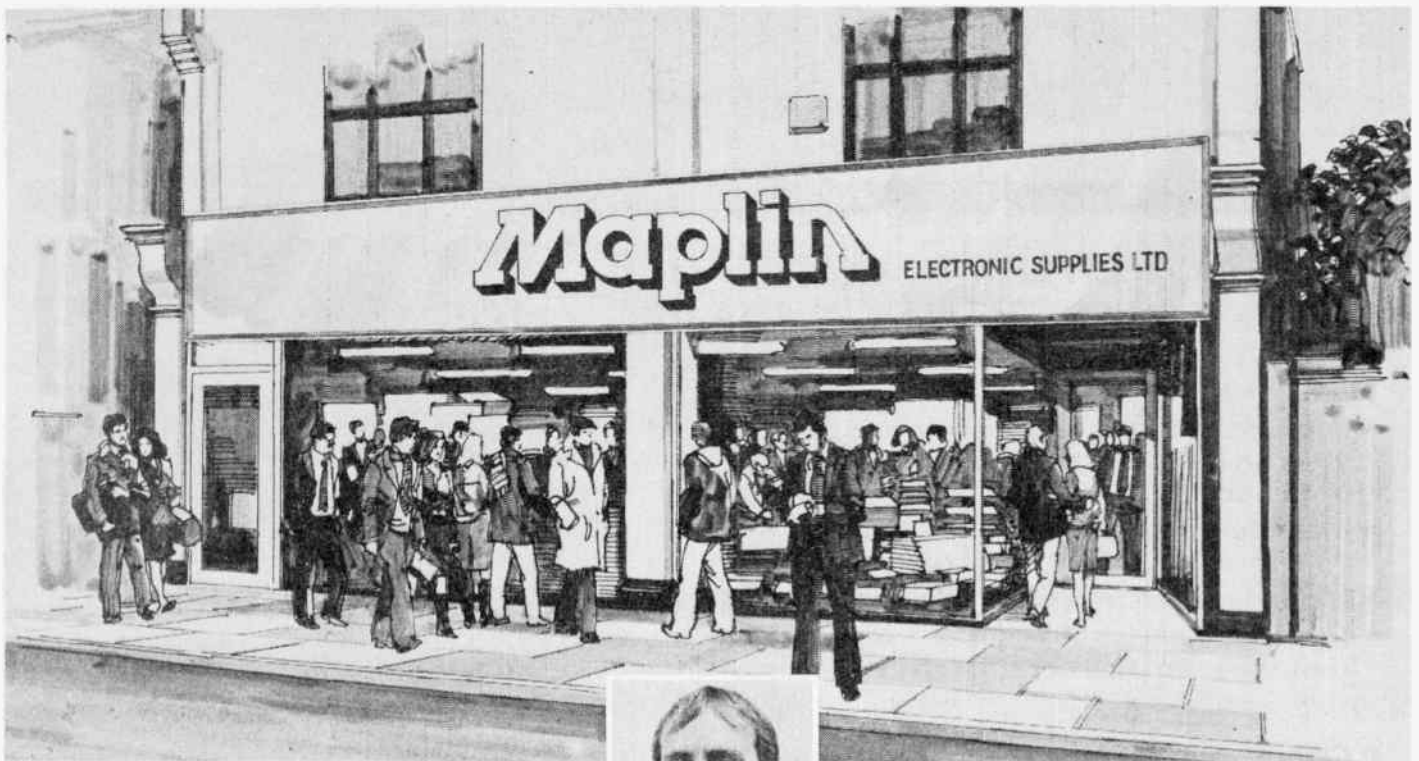
Doris

and as far as you can, then turn right and our shop is 20 yards on the right (approx. 1/2 mile from TV studios). Parking

is free right outside the shop. From Southampton railway station, a No. 17 bus will bring you to the shop and other

routes passing the door are No. 3, 3A, 12, 13, 13A and 13C. Our shops accept Access, Barclaycard, American Express and Mapcard, and cheques up to £50 with a cheque guarantee card. If you bring lists of components you require, it will help us to serve you more quickly, if you use descriptions rather than just order codes, and group similar components together in value order. If you're coming for a particular item, a quick phone call will enable you to be certain we have everything you want in stock. We look forward to serving you.





282-284 London Road,
Westcliff-on-Sea, Essex.
Tel: (0702) 554000.
Opening hours: 9 to 5.30.
Tuesday to Saturday.
Closed all day Monday.

Serving Essex and Kent, our Southend shop is situated on the A13 (London Road), in easy walking distance of Westcliff and Southend Victoria stations. By road we're only 30 minutes from the M25 (junction 29) as well. There is free parking outside the shop or in the road opposite.



Patrick

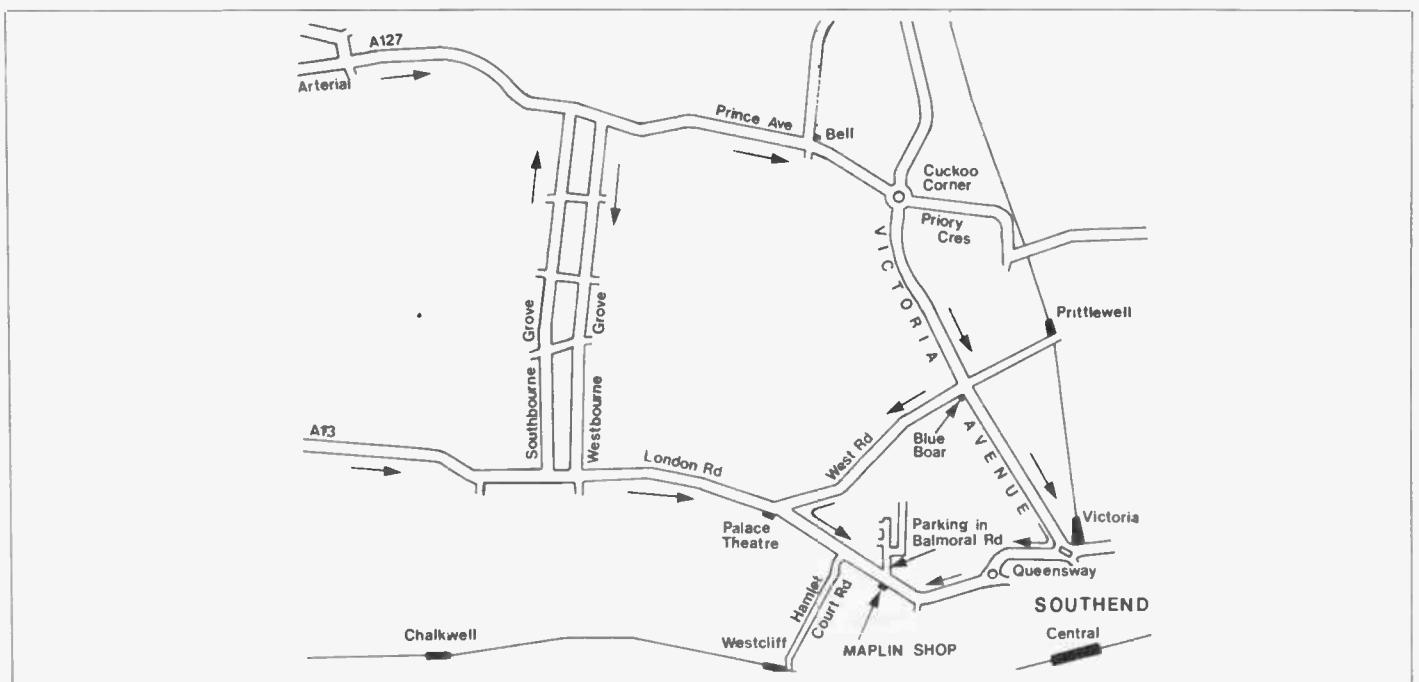


Tony



Ricardo

Our shops accept Access, Barclaycard, American Express and Mapcard, and cheques up to £50 with a cheque guarantee card. If you bring lists of components you require, it will help us to serve you more quickly, if you use descriptions rather than just order codes, and group similar components together in value order. If you're coming for a particular item, a quick phone call will enable you to be certain we have everything you want in stock. We look forward to serving you.





ONLY £3



FOR A WHOLE YEAR'S SUBSCRIPTION TO 'ELECTRONICS - THE MAPLIN MAGAZINE'

- ★ Every issue sent to you as soon as it's printed, post free.
- ★ Packed with interesting and novel projects that you can build with all components easily obtainable.
- ★ Many features on electronics subjects to keep you up-to-date with latest developments.
- ★ More pages to read than the monthly magazines.
- ★ And much, much cheaper too. Many of the monthlies are now £1 or more per issue!

BUYING A SUBSCRIPTION IS THE BEST WAY TO BUY 'ELECTRONICS'

'Electronics' is different from any other electronics magazine for two reasons:

1. It's quarterly, so it's hard to remember when a new issue is due out both for you and your newsagent.
2. We don't carry any advertising, which means that having lots of copies sitting on the newsstands waiting for casual sales is of no advantage to us. The newsagent will normally have plenty in stock of those magazines which advertise because in almost all cases, he can return them if they are not sold - so he doesn't pay for them.

'Electronics' has no advertisers to pay for unsold copies, nor does it need to have an impressively large circulation, so the newsagent must buy all of his delivery of 'Electronics' and cannot return those he doesn't sell. Therefore, he may not want to take stock of too many. Before you know where you are, 'Electronics' has sold out!

That's why you'll need to place a firm order with your newsagent to be sure of obtaining each new issue. Better still, place the order directly with us by sending £3.00 now and we will send you every issue for a year, post free.

Despite having very few casual sales, 'Electronics' sells as many copies as the top selling monthly magazines. So we can justly claim if not quite the largest, definitely the largest committed readership in the U.K. of any electronics magazine.



Please send me the next issues of 'Electronics - The Maplin Magazine' at 75p per copy (minimum £3)*. Please start with issue number Overseas surface mail add 24p per copy, air mail add 87p per copy. I enclose cheque/P.O. for £.....
 Customer No. (if known)

Name

Address

.....

.....Post Code.....

* Order as many copies as you wish, you will not be affected by future price increases until your subscription ends.

Publication dates are as follows:

XA17T	Issue 17	8th November 1985	Price 75p NV
XA18U	Issue 18	14th February 1986	Price 75p NV
XA19V	Issue 19	9th May 1986	Price 75p NV
XA20W	Issue 20	8th August 1986	Price 75p NV
XA21X	Issue 21	14th November 1986	Price TBA

Maplin Electronic Supplies Ltd. are pleased to introduce you to MAPCARD, a new way of buying from Maplin. Apply for your MAPCARD now to obtain these special privileges.

- ★ On receiving your MAPCARD you will be able to purchase items up to 24 times your monthly payment.
- ★ Planned expenditure — you pay a fixed amount every month as long as you spend within your credit limit.
- ★ Mail order by phone — no need to post anything to us, just tell us your MAPCARD number and we will select, pack and post your order minutes after your phone call.
- ★ In our shops — MAPCARD is an easy payment method; just sign the voucher and take the goods.

MAPCARD buys anything Maplin sell.

With a MAPCARD you can buy anything Maplin sell including special offers, both in our shops and by mail-order.

No deposit is needed

Once you have your MAPCARD, there are no deposits to pay and no forms to fill in.

In our shops, just present your card and sign the sales voucher. By mail-order, just tell us your MAPCARD number. Note that for your protection, goods can only be sent to the cardholder's address.

Instant Credit

On applying for your MAPCARD you may be entitled to instant credit up to £300 even though your card has not yet arrived. Ask the store staff for details.

The repayments

You choose the monthly payment you wish to make and then as long as you keep within your credit limit (24 times the monthly payment), the repayment always stays the same. For example, £10 per month gives you credit up to £240.

You can buy again before the whole debt is paid off

You can buy goods up to your credit limit at any time whether or not there are outstanding debts.

The cost

Interest is charged on the balance outstanding on the due date each month. The interest rate depends on how you choose to make your repayments. If there is no outstanding balance then there is no cost.

How to make the repayments

The cheapest way is to repay by Banker's Order or by National Giro Order. The interest rate charged will be **2.35%** per month (**APR = 32.1%**). If you repay by paying-in book at any bank, then the interest charged will be **2.75%** per month

(**APR = 38.4%**). Note that interest rates may vary from time to time in accordance with the Conditions of Use.

You do not have to have a bank account

You do not have to have a bank account to have a MAPCARD. You can repay by paying-in book at any bank whether or not you have an account there. However, the interest charged is slightly higher.

What to do if you lose your MAPCARD

If you lose your MAPCARD you must notify Maplin Electronic Supplies Ltd. or North British Credit Ltd. within 24 hours by telephone and confirm in writing to North British Credit Ltd. We will immediately prevent its use.

What happens if you're ill and unable to work

We have arranged a protection plan for you which meets your repayment liabilities if you are unable to work through accident or sickness. All it costs you is 25p per month per £100 outstanding balance. In the event of your death, the entire account is paid off automatically. More details are given overleaf.

How to get your MAPCARD

Simply fill in the application form attached and post it today — you won't need a stamp. As soon as your application is approved, your MAPCARD will be sent to you and you may use it at once. Approval usually takes less than two weeks.

The Customer Subscription Protection Plan

This optional plan has been designed to protect you and your family against unforeseen events that might stop your income and harm your ability to meet financial obligations that you enter in good faith.

It enables you to plan for your family's needs the modern way and at the same time feel secure.

Your protection

The certificate of protection covers you in respect of any balance outstanding on your monthly account statement. In the event of either accident or sickness all you have to do is send us a medical certificate as proof of disability. In the event of death your account is automatically paid in full.

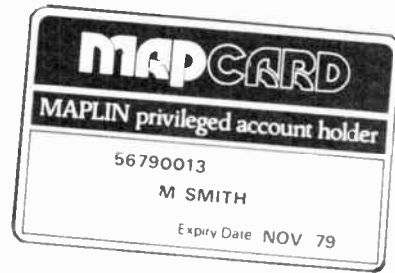
What's the cost?

If you choose to take advantage of this insurance plan you are only charged 25p per £100 on the outstanding balance on your monthly statement. Should there be any necessity to amend this rate you will be given 3 months notice. Therefore you are in full control. Nothing outstanding — no charges.

APPLY FOR YOUR MAPCARD NOW!

It's simply the best way to buy from Maplin.

Full details of the Mapcard credit scheme may be found on page 12. Please cut out this application form and post it now. If you do not wish to cut your catalogue, pick up an application form from one of our shops or ask for one from our mail-order department.



North British Credit Ltd

Regd Office: Paragon House, Ferensway, Hull
Regd. No. 1090038 (England)

APPLICATION FORM

PLEASE COMPLETE ALL SECTIONS IN BLOCK CAPITALS AND TICK (✓) WHERE APPLICABLE WE MAY ASK FOR REFERENCES

MAPCARD Credit system				Instant Credit Authorisation	
Surname <input type="checkbox"/> Mr <input type="checkbox"/> Mrs <input type="checkbox"/> Miss		First names		<input type="checkbox"/> Married <input type="checkbox"/> Single <input type="checkbox"/> Divorced <input type="checkbox"/> Widower	Date of birth
Private address (inc. Post Code)		Present address is a <input type="checkbox"/> House <input type="checkbox"/> Flat <input type="checkbox"/> Bedsit <input type="checkbox"/> other		No of dependent children	
Home telephone number		Address is occupied as <input type="checkbox"/> Tenant (Unfurnished) <input type="checkbox"/> Tenant (Furnished) <input type="checkbox"/> Owner <input type="checkbox"/> with Parents		for _____ years _____ months	
If less than 3 years at present address please give previous addresses to cover the last 3 years		for _____ years _____ months		Business telephone number	
Your own occupation		Employer's name and address (or that of your spouse if you have no taxable income of your own)		for _____ years _____ months	
Annual Income		Previous occupation		Previous employer's name & address	
If less than 3 years with present employer please state		for _____ years _____ months		Name & Address of Nearest relative not residing at your address	
Banker's name and address		Account No		Type of Account <input type="checkbox"/> Current <input type="checkbox"/> Deposit <input type="checkbox"/> Loan	
Please sign attached Banker's Order, if you have a Current A/c		Date of agreement		Monthly repayments	
Credit Accounts (Current or completed in the last 4 years)		Finance Company & address		Amount outstanding	
Account number		f _____ x _____ months		Account number	
AMOUNT OF MONTHLY SUBSCRIPTION £ _____ .00 (Minimum £5)		f _____ x _____ months		Account number	
CREDIT LIMIT APPLIED FOR £ _____ .00 (Twenty four times monthly subscription)		f _____ x _____ months		Account number	
I warrant that the above information is true and that I have read and agree to all the conditions of use overleaf. Where instant credit is arranged, I agree that the amount of the debt due to the suppliers shall be charged to my account and be payable Applicant's		Date		<input type="checkbox"/> Tick this box if you do not wish to take advantage of the subscription protection plan	
Signature		Date		I confirm that I am in full time gainful employment and that I am not absent from my employment due to injury or sickness. I also confirm that I am less than 64 years of age	
I authorise North British Credit Ltd to apply to any monies payable under the Master Policies to meet instalment(s) or in the event of my death the outstanding balance due under the subscription		FINANCE COMPANY USE ONLY		Manager's Signature	
Date Received		Indem Req'd		Date	
B Order		B Giro		N B C ACCOUNT NUMBER	
[]		[]		[]	

Banker's Order

To _____ Bank Limited

Address _____

Please pay to YORKSHIRE BANK LIMITED
Hull City Square, (05 05 05) for the credit of
North British Credit Limited Credit Card Arc No 25911838

payments of £ _____ commencing on the _____ day of _____ 19 _____ and each month thereafter until further notice and debit my _____ account with you

Name and _____

Address _____

PLEASE QUOTE N B C REF No []

National Giro Order

The Accounts Manager
National Giro Centre
Boothle 10, Lancs. G1R 0AA

Please transfer from my _____ Giro A/C No []

To the credit of Giro A/C No **615 8730**

Customer's Signature _____

CUSTOMER'S BANK ACCOUNT No _____

Full details of the Mapcard credit scheme may be found on page 12. Please cut out this application and post it now. If you do not wish to cut your catalogue, pick up an application form from one of our shops or ask for one from our mail-order department.



Postage will be paid by licensee

Do not affix Postage Stamps if posted in Gt Britain, Channel Islands, N Ireland or the Isle of Man

BUSINESS REPLY SERVICE
 Licence No. H.U.66.

**NORTH BRITISH CREDIT LTD.
 CREDIT CARD DEPARTMENT
 P.O. BOX 82,
 PARAGON HOUSE,
 FERENSWAY,
 HULL,
 HU1 1BR**

Flap A

2nd Fold

3rd Fold

Flap B Tuck Flap A inside here



1

Postage

CONDITIONS OF USE

The Credit Card must be signed by the person to whom it is issued immediately on receipt and such signature and/or the use of the card will constitute the Cardholders agreement that he/she and his/her personal representatives shall be bound by the following conditions

- (1) "North British" means North British Credit Limited, its successors or assigns. "the Credit Card" means the card currently issued by North British to the Cardholder. "The Cardholder" means the person to whom or for whose use the Credit Card is issued by North British or the Cardholder's personal representatives and "the Supplier" means the establishment supplying goods or services to the Cardholder.
- (2) The Credit Card can only be used by the Cardholder named thereon for purchases at the establishments referred to on the Credit Card and up to the credit limit notified to the Cardholder. The Cardholder shall sign a sale voucher but if this is not done the Cardholder will nevertheless remain liable to pay North British all amounts charged to his account.
- (3) North British will purchase from the Supplier all debts incurred by the Cardholder in respect of the use of the Credit Card. The face amount of such debts will be charged by North British to the Cardholder's account and a statement of amounts so charged will be sent to the Cardholder every month.
- (4) The Cardholder will pay to North British the agreed monthly subscription on the due date as notified to the Cardholder by North British and thereafter each month on the same day.
- (5) North British will allow the cardholder credit not exceeding an amount equal to 24 times the agreed monthly subscription or such higher or lower multiples as North British may from time to time determine.
- (6) Interest will be charged at 2.35% per month APR 32.1% for Bankers Order/National Giro Order payments and at 2.75% per month APR 38.4% for payments by any other method. The interest will be charged on the total amount outstanding on the Cardholder's account on the due date each month and will continue to be charged on the balance outstanding until full payment is made.
- (7) Payments made by the Cardholders to North British will be applied by North British on the date of receipt at North British's bank, first in payment of interest shown on the latest and any previous statement and secondly to the Cardholders remaining outstanding balance.
- (8) The whole of the outstanding balance on the Cardholder's account shall become due and payable to North British on the bankruptcy or death of the Cardholder or (at North British's discretion) if the Cardholder is in breach of any of these conditions.
- (9) Should the Credit Card be lost or stolen the Cardholder must notify North British within 24 hours by telephone and confirm in writing to North British Credit Limited, Paragon House, Ferensway, Hull, HU1 3BL immediately or to such other address as may be notified by North British to the Cardholder. Full receipt of such notice the Cardholder will be liable for any payment made with the Credit Card. This liability will be limited to £25.
- (10) The Credit Card remains the property of North British at all times and North British may without notice withdraw the Credit Card and cancel the credit facility. The Cardholder must immediately on request return the Credit Card to North British's authorised representatives.
- (11) The Cardholder must notify North British of any change of name and address of the Cardholder.
- (12) North British will not be liable for the refusal of any person to accept or honour the Credit Card. North British will only credit the Cardholders account with the amount of any refund on receipt of a properly issued refund voucher.
- (13) The Credit Card must not be used outside the Scheduled Territories as defined by the Exchange Control legislation.
- (14) North British Credit Limited reserve the right at all times to vary these conditions. Any such variation will become effective upon notification to the Cardholder in the manner prescribed by law.

STAR REASONS WHY MAPLIN MUST BE YOUR FIRST CHOICE FOR COMPONENTS EVERY TIME

- ★ New low prices right through the catalogue.
- ★ Top quality components no rejects, no re-marks.
- ★ Same day service on all stock items.
- ★ Excellent stock levels – about 2 million pounds worth in stock. Usually over 97% of all our lines in stock too.
- ★ Honest prices. All our prices include VAT where applicable.
- ★ Simple carriage charge. Straight-forward 50p carriage charge on every order, plus 50p handling charge on very small orders.
- ★ All goods sent by first class post up to 750g.
- ★ Post paid ordering. First class reply paid envelope with every order.
- ★ Prices fixed for 3 month periods and price lists available.
- ★ Easy complaints procedure – if we do get something wrong just fill in the form on the reverse of your invoice and return it post-paid. We will correct our error immediately.
- ★ Large range. Probably everything you need from one source.
- ★ Security. We are a reputable company. You can be confident your money is safe with Maplin.
- ★ Telephone sales – with same day despatch on orders received by 2 p.m.

HOW TO ORDER IN THE UK

Use our order form whenever possible. The blank one returned with your previous order will have your customer number and your name and address already printed on it. Please keep a note of your customer number and always use it on any order or correspondence. Keep an accurate copy of your order so that you can check that we have sent you exactly what you have ordered. We will send an itemised invoice with your order which shows exactly where your money has been used.

Please do not write queries or anything other than your order on the order form unless the query is about something you are ordering this time. If you have any other enquiry, write it on a separate piece of paper with your name and address and customer number if known.

Please use the Order Code

Using our order codes helps us to deal with your order quickly and efficiently. Each item has its own code number which (except for resistors) is a five character code in the format: Two letters, two numbers then one letter. The code is always shown after the word "Order". No further description is necessary, but if you wish, to assist you identify the codes, you can also write a brief description of the item, and to help you we have put this description in brackets after the five character code. Details of how to order resistors are given at the beginning of the Resistor Section.

Prices

All prices shown in this catalogue are valid until 15th February 1986. After this date please write or phone for a free copy of our Price Change Leaflet (CA99H) or a free copy of our complete Price List (XF08J).

Prices shown in this catalogue include VAT at 15% where applicable and are for the quantity shown i.e. each, per pack, per metre etc. Items marked *NV* are

rated at 0% and the price shown applies both to inland and export orders. Overseas customers please see "How To Order If You Live Outside the UK".

All prices are the same in our shops and by mail-order. A 50p charge is levied on every mail order to go towards the cost of carriage and packing. There is an additional charge of 50p on very small orders having a total value for goods under £5.

Note. If the British Government change the rate of VAT or change the rules under which some items are at present zero rated, then our prices will change in accordance with the new rates as soon as they come into force.

Trade Prices

Bona fide trade customers should contact our sister company Maplin Professional Supplies, P.O. Box 777, Rayleigh, Essex SS6 8LU. Tel: 0702 552961.

Price List

Our current price list is published every three months and is available in the form of a newsletter free of charge if you send an sae.

Alternatively, if you send 50p in advance we will mail to you as soon as published, the three price lists that will be published during the life of this catalogue. In addition prices that have changed since this catalogue only until publication of the next edition (Nov 86) will be published in 'Electronics – The Maplin Magazine' on sale at newsagents or by subscription. Copies of the price list are also available free of charge in our shops.

Despatch

We despatch all orders having a total weight of less than 750 grammes by first class letter post (except leaflets and catalogues which are despatched second class). Orders having a total weight over 750 grammes are despatched by parcel post, except as follows. Oscilloscopes and items which are priced

individually over £200 approx. are despatched by a secure carrier. Other items marked "Delivery by carrier" are despatched by special carrier. If your order includes an item that we despatch by special carrier, we may include all or part of the rest of the order in that shipment. However, you may mark your order in large writing "Despatch all items other than carrier items by post", and we will follow your instructions.

Payment

Payment may be made by cheque, Credit Card, Postal Order, Giro transfer or Transcash. Cheques and Postal Orders should be made payable to "Maplin Electronic Supplies Ltd." In your own interest cross all cheques or Postal Orders sent in the post with two straight lines across the centre. For details of the credit cards we accept and details of Transcash and Giro transfers, see below.

Do not send cash unless the envelope is registered at the Post Office. If you send cash in an ordinary envelope the Post Office may compulsorily register it and we regret that we cannot accept such letters. REMEMBER TO ENCLOSE WITH YOUR ORDER THE NUMBERED CREDIT NOTE IF YOU ARE CLAIMING CREDIT.

Please remember to add 50p towards the cost of carriage and packing on every order. A further 50p handling charge must be added to very small orders having a total value for goods under £4.50. If your order for goods is between £4.50 and £5 please send £5 plus the 50p carriage & packing charge (i.e. £5.50).

Telephone your Order

If you intend to pay for your order by credit card, you may telephone your order to us. We shall require your credit card number, the expiry date of your credit card and the cardholder's address (and goods will only be sent to this address) and full name. We shall normally be able to despatch on the same day all orders received by telephone before 2 p.m.

When you telephone be as brief as possible. Please give your order in the following manner: state the five digit order code only and then the quantity you require. If possible always quote your customer number.

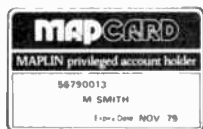
The Maplin Sales Desk is available Monday to Friday from 9 a.m. to 5.30 p.m. on Southend-on-Sea (0702) 552911. There are five lines on this number and after dialling, if you hear the ringing tone, your call has entered a queuing system to ensure that it is answered in its correct turn. In order to save you money, if all our sales staff are dealing with other customers, your call will not be answered until someone is free to deal with it. In this way you do not start to pay for your call until a person who can actually help you is available. So if you get a ringing tone, please hang on until we answer, as you will now be in our queuing system. Please do not call our shops; they will not be able to help you with a mail-order enquiry or order.

Methods of Payment for UK Customers

Payment may be made by Cheque, Postal Order, Cash in a Registered Envelope, Credit Card, Giro Transfer, Transcash or Credit Terms.

Credit Cards

We are pleased to accept orders with payment by any of the following credit cards: Access, American Express, Barclaycard, Eurocard, Mapcard, Mastercard and Visa. NEVER send your card to us.



Simply write the number and expiry date of your credit card on your order, sign it and send it to us. Do not include any money. Please note that we have to check every order with the credit card company and the address for goods to be despatched to must be the same as the address known to the credit card company. For full details of Mapcard see page 12.

Place your Order in your Post Office

If you're fed up with having to buy Postal Orders then you'll be pleased to hear about TRANSCASH – a new service from the National Girobank. Simply ask



for a form in your Post Office and write your order on it along with our TRANSCASH number. You then pay the amount due to us to the cashier at the Post Office (plus a small fee to the Post Office) and that's it. No stamps to buy, no letters to post, no fiddly Postal Orders. We receive your order within two days and can despatch it immediately.

National Girobank looks after your money safely and simply. Next time you go to buy Postal Orders – don't! Use TRANSCASH instead. It's a great new

service from your National Girobank. Take a note of Maplin's TRANSCASH number now – TRANSCASH 308 8065. Use it at your local Post Office now!

Paying by Giro Transfer

You can transfer money from your Giro account directly into our Giro account by completing and sending to the National Giro Centre, in one of your National Giro postage paid envelopes, one of your own National Giro transfer/deposit forms. Write your order and your customer number (if you know it) on the back of the form. We receive your order in two or three days and can despatch it immediately. National Girobank looks after your money safely and simply.



Make a note of Maplin's National Girobank account number now. It's shown in the panel above. Please do not send Giro transfers to us as this will cause considerable delay. Use a crossed Girocheque if you wish to send money directly to us.

Credit Payment Terms

We can offer credit terms with up to 36 months to repay on any order whose total value exceeds £140. For full details and a written quotation (if required) please contact our sales department or one of our shops. For this service we act as credit brokers. These terms are only available to persons aged over 18 living on the UK mainland and are subject to status.

Special Note for Customers in the UK and the Republic of Ireland but NOT on the UK Mainland

On all items marked Delivery by Carrier there is an additional charge of £5 to all addresses in the UK that are not on the mainland, to cover ferry charges. Customers in the Channel Islands and the Republic of Ireland do not have to pay British VAT, and should mark their orders 'EXPORT', or if using our order form, tick the Export box. To calculate the value of your order, total all items except those marked NV and then divide by 1.15. The total you have to send is then this amount plus the NV items plus the standard 50p carriage charge. If the value of goods in your order is under £5, then please add 50p handling charge also. If your order contains a Delivery by Carrier item then please add £5.

Will customers from the Republic of Ireland please add 40p and then 35% to the total cost of their order to cover the rate difference between the Punt and the Pound and the banks negotiation fees. We will refund any difference; please state cheque or credit note. Alternatively, if you pay by bank draft drawn in pounds sterling on a London bank, then you need add nothing extra. Bank drafts drawn in pounds sterling should be readily available from your local bank.

How To Order From BFPO Addresses

If your BFPO address is in Northern Ireland you must use the ordinary inland prices, but if your BFPO address is elsewhere in the world you do not have to pay VAT and there are no additional postage charges.

However if any item is too large or heavy for despatch by BFPO you must supply a civilian address and pay extra for carriage at cost.

Credit

When we are out of stock of an item that you have ordered we may issue a numbered credit note. If you do not want to buy anything further from us, simply put the credit note with your name and address and your request for a refund in the reply paid envelope

and we will send a cheque refund by return of post. We regret that we cannot refund by Postal Order and we can only refund cash if you provide a Post Office registered envelope prepaid with the correct stamp. If you do not have a bank account, you can pay cheques made out to you into P.O. savings accounts or anyone who has a bank account will be able to cash the cheque for you.

If any item on your invoice is marked 'to follow' then we will automatically send it to you as soon as it comes into stock. As before, however, if you wish to cancel then you can do so at any time until we despatch the goods and we will refund your money as described above.

Business Reply Envelopes

Our prepaid envelopes are provided for your convenience when ordering. If you are returning faulty goods or goods sent in error, please do not send them in the envelope, but pack them carefully in a padded bag or box and attach the envelope to the outside.

If the total weight of the packet is over 750 grammes, please pay for parcel post and we will refund the charge. (We have heard from several customers, that Post Offices have refused to accept packets under 750 grammes paid with the Business Reply Envelope. If you encounter this problem, let us have the address of the Post Office at once and we will inform their local Operations Branch so that matters can be corrected immediately.)

Returns

You may return faulty goods or goods sent in error, but please do not return goods otherwise, without advising us first in writing and waiting for our consent. Faulty goods or goods sent in error will be replaced as soon as we receive them, provided that they have been carefully packed (see Business Reply Envelopes above) and provided that we have stock. If you have to pay for postage then we will refund it.

We do not operate an 'on approval' system, therefore if you return goods which are neither faulty nor sent in error, we will make a charge to cover our handling, packing and postage costs (usually 10% of the value of the goods returned, subject to a minimum charge of 50p). If the goods are in a resalable condition we will refund the remainder.

VAT

All our prices include VAT and zero rated items are marked NV in our price lists to help our overseas customers.

See note under 'Prices' above.



TERMS OF BUSINESS

Every order placed is subject to the following terms and conditions.

Method of Payment

Payment is by cash with order, credit card, Transcash, Giro transfer or 30 days net account to approved trade customers only. Cheques, Post Office Giro Cheques, Postal Orders and Money Orders should be crossed and made payable to "Maplin Electronic Supplies Ltd". Do not send bank notes in the reply paid envelope.

Carriage and Packing

There is a 50p charge on all orders for carriage and packing. In addition for very small orders a 50p handling charge is made, and an extra charge on items marked "Delivery by Carrier". Our price list gives details.

Guarantee

Maplin Electronic Supplies Ltd guarantees that all goods described in this catalogue are brand new and meet the manufacturer's published specifications. Goods returned to us faulty will normally be replaced at the discretion of Maplin Electronic Supplies Ltd. provided that the goods have not been misused or damaged in any way. Maplin Electronic Supplies Ltd. shall not be liable in respect of defects in goods supplied for any injury, loss or damage resulting from such defects. At our discretion goods returned to us faulty (especially integrated circuits) may be referred to the manufacturer for their decision. Integrated circuits are not guaranteed if they have been soldered (excluding quad-in-line types and types where we recommend direct soldering). If you wish to take advantage of the guarantee you must use sockets. This statement does not affect your statutory rights.

Guarantee for Kits

All the components in our kits carry the guarantee that they meet the manufacturers specifications. We guarantee that the kits, correctly built, using components supplied by us, will work to the specifications published in our advertising and construction details. The guarantee does not cover damage caused during construction or errors in construction. We have no control over the constructor's ability and recommend that if after studying the construction details you feel that the project is more complicated than you expected, please contact our sales department who will arrange for you to return the kit for a refund subject to our 10% handling charge. This offer only applies to kits where construction has not started.

Returns

Except for faulty goods or goods sent in error, no goods may be returned without our prior consent in writing.

Despatch

Orders will normally be dealt with on the day of receipt. Any item out of stock will normally be considered cancelled and a credit note issued to the full value (but see "Credit" above). Credit notes are redeemable on demand and repayments will be by cheque.

Specifications and Illustrations

Specifications and illustrations in this catalogue are given in good faith, but they should be regarded as for guidance only as goods are subject to alteration without notice in order to maintain delivery or price levels.

Prices

The price charged will be that ruling on the day of despatch. In general prices are reviewed every 3 months, at which time some may change. In between review dates prices are as shown on the current Price List.

If Rayleigh in Essex seems a long way off – Don't Worry – With the Royal Mail's help, we're as good as Next Door!



At 4.30 p.m. every weekday afternoon the Royal Mail call at our warehouse near Rayleigh to make their last collection from us for that day, and then take our mail back to the sorting office at Southend. Southend is not a particularly central location for nationwide mail-order service, but it does have one surprising advantage: an airport.

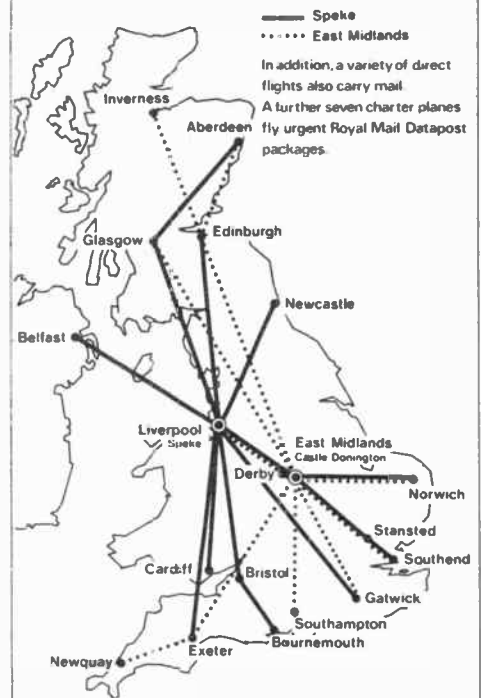
Once the mail is sorted and Home Counties and London bound mail sent off by road and train, the remainder begins a remarkable journey. At Southend airport, a Jersey European Airways twin otter aircraft is waiting to take the mail, first to Stanstead where some mail is off-loaded, then on to the East Midlands airport near Derby.

Here the mail is off-loaded and re-sorted ready to be taken to one of the six destinations served by Derby, in a high-speed operation which has to fit into the timetable of the seven planes that fly in and out of here every night carrying the mail. By midnight the first plane is already on its way and the others follow shortly after.

The mail off-loaded at Stanstead is destined to join the Royal Mails other flying network centered on Speke airport at Liverpool. Every night, the mail from Essex is carried by Genair shorts 330 aircraft from Stanstead up to Liverpool and then on to eleven other far-flung destinations in the UK. The traffic on this amazing network of interconnecting aircraft goes on until the early hours of the morning, when the mail coming from the network arrives back at Southend airport, ensuring that the first-class letter you posted to us one day reaches us, first thing the next.

It's a fact, that an order posted to us at 5.30 p.m. on a Monday could be back on your doorstep by 7.30 a.m. on the Wednesday – less than 40 hours for the complete journey, thanks to our same day service and just a little help from the Royal Mail.

Royal Mail East Midlands and Spokes from Speke Air Networks



CASHTEL ON 0702 552941

Here's an exciting new way to buy from Maplin. In fact, the service is so new we even had to invent a name for it. Cashtel stands for Computer Aided Shopping by TELEphone and if you've got a computer of any make, then you only need a modem and interface to be able to use the service. For details of the modem and interfaces that we can supply, see the Projects Section in this catalogue. If you wish to buy a modem elsewhere then you should specify a 300-baud type with CCITT standard tones. Most modems have an RS232-type interface so your computer will need an RS232 output. The BBC micro has one and some others do as well, but if not then you will require an interface to turn whatever output is available into RS232 standard. Most home computers are not designed to be used directly as terminals to talk to other computers. To function as a terminal, your computer must transmit to the telephone line (via the modem) anything typed on the keyboard and not display it on the TV screen, but must display on the screen anything received (via the modem) from the telephone line. When you type on your keyboard, the Maplin computer sends it back to your TV screen (echoes) the characters it receives. This guarantees that we cannot receive garbled data without your knowing about it. To make your home computer function like this, you will need a special program. Many companies supply programs to perform this function and Maplin have programs for the Commodore 64, Dragon, Spectrum, VIC-20, ZX81 and (at time of writing) Oric which are supplied with the relevant interface kit. The program for the BBC is listed below:

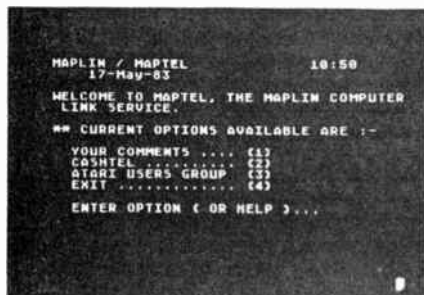
```

5 REM BBC VDU PROGRAM R.K. 1983
10 CLS
20 = FX 7,3
30 = FX 8,3
40 = FX 2,2
50 A = INKEY(1): IF A = -1 THEN 100
60 = FX 3,7
70 VDU A
80 = FX 3,0
90 GOTO 40
100 = FX 2,1
110 = FX 3,0
120 A = INKEY(1)
130 IF A > 31 THEN VDU A AND 127
140 IF A = 41 THEN GOSUB 200
150 IF A = 13 OR A = 10 THEN VDU A
160 GOTO 40
200 A = 10 : VDU A
210 A = 13 : VDU A
220 RETURN
    
```

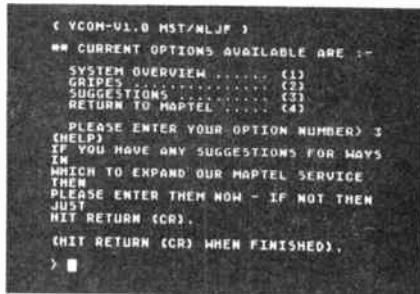
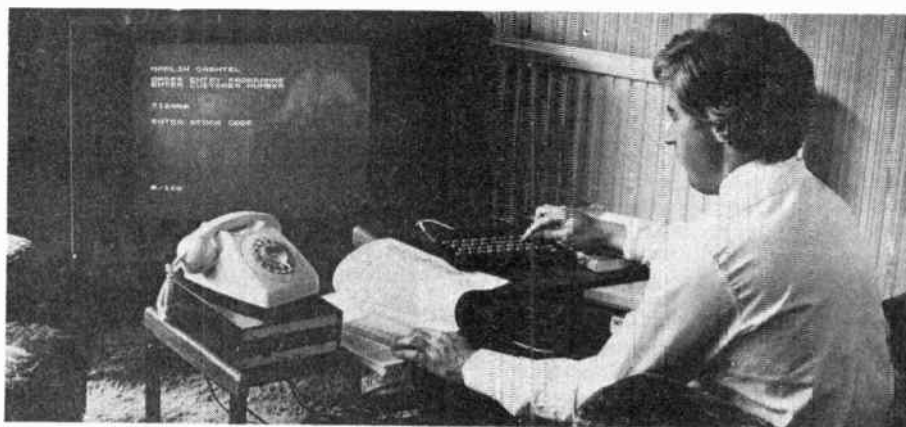
How To Use Cashtel

Once you have the appropriate hardware and software, simply dial 0702 552941 and listen for the tone. When you hear it, switch the modem to "on-line" and replace the telephone handset.

1. Your TV screen will now display the message shown in photograph A.

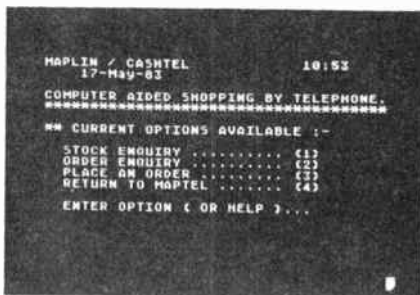


A



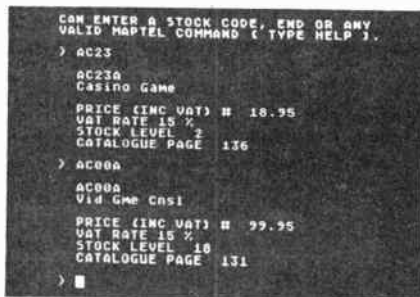
B

2. If you enter option 1, the message shown in photograph B will be displayed.
- 2a. Entering option 1 from this screen gives you a message describing the system.
- 2b. Option 2 allows you to leave a message describing any problem you have had.
- 2c. Option 3 allows you to leave a message with any suggestions you may have.
- 2d. Option 4 returns you to the message shown in photograph A.



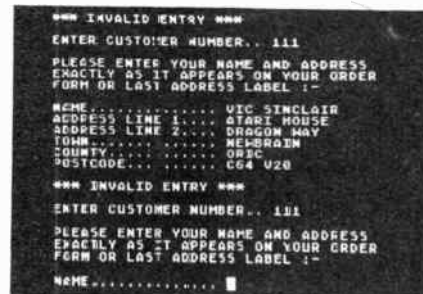
C

3. If you enter option 2 on the main menu, you will see the message shown in photograph C.



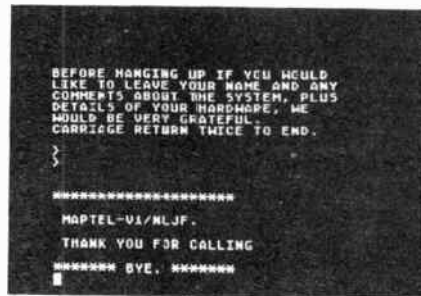
D

- 3a. Option 1 allows you to check our current stock level and price of any item as shown in photograph D.
- 3b. Option 2 allows you to check your previous orders (whether placed by mail, 'phone or Cashtel). However before this is permitted, you must enter your customer number and your name and address, which must match exactly the details on file (thus users cannot interrogate other customers' details). Photograph E shows an invalid entry for customer number 111.



E

- 3c. Option 3 enables you to place orders. You will be asked for the stock number and quantity of the item you require, then the description, unit price and totalling price will be displayed. You are then asked for the next stock code and so on until you type END. Your whole order is then displayed line by line and you choose to order or not by typing Y or N (Yes or No). You are also told at this time if any item is unavailable and if you still leave the order for the item outstanding, then it will be sent on to you by the computer as soon as it becomes available. When all items on the order have been displayed, the screen displays the total price of all items ordered. Only if you now say Yes to the whole order, will the order actually be sent. You now enter your Access, Barclaycard, American Express, Mapcard number or account number (trade customers only) and the order is immediately printed out by the computer ready to be collected and despatched.
- 3d. Option 4 returns you to the message shown in photograph A.
4. If you enter option 3 on the main menu you will be able to access information supplied by the UK Atari Computer Owners' Club. We hope to provide information from other computer clubs here also at a later date. In addition, a Billboard service will be available later, where users can leave private or public messages for other users to see.



F

5. If you enter option 4, the call is terminated and the screen shown in photograph F is displayed. The system then disconnects and awaits the next call. The complete system (Maptel) which began on June 1st 1983, is available between 0900 hours and 1730 hours Monday to Friday at present, whilst a non-interactive system is available for the rest of the time including weekends.

Repairs and Get-You-Working Service

We will undertake to repair or get working any of the projects published in our constructional articles, providing that they are built on our ready-etched printed circuit boards, and use a majority of components that we have supplied. We regret that we cannot offer this service on magazine projects, other than those in our own publications, even if we are mentioned as suppliers of the parts or supply a pcb for the project. Please return the whole completed project not just the faulty board (if it is a large project) as faults on one board are often caused by problems on another board in the project. Enclose a cheque or P.O. for approx 10% (minimum £10) of the cost of the components being returned. If the boards arrive damaged by the Post Office, they will be returned to you with your money after deducting the return postage. Under no circumstances will we be liable for damage to goods sent to us. In addition we will not attempt a repair if the quality of construction is so poor that the only answer is a complete re-build. Again the package will be returned to you with your money after deducting the return postage. If the fault is due to faulty components, or incorrect instructions or any error on our part which could have led to the fault, we will repair the board and return it to you carriage paid with a refund of your postage to us.

If the fault is due to an error or errors you have made we will charge you for our time at a reasonable rate (approx. £10 per hour or part of an hour) and for the cost of any parts replaced. If this is less than the amount you sent, we will refund the difference after deducting the cost of postage to you. If the cost including return postage is more than the amount you sent, we will ask you to pay the difference before the goods are returned. Since most companies now charge £15 per hour for maintenance engineers, we consider our charge of £10 per hour to be extremely low. But remember that it can take our engineer up to an hour (or much more on large projects) to set up the necessary test jig that will enable him to start testing your particular project and then take him some time to find the fault. So if you are not actually prepared to pay our very reasonable charges then please do not return your projects for repair! We will make the repair as fast as we possibly can, but please allow three weeks. We will acknowledge receipt of your parcel by return of post (2nd class). Ready-made goods which are faulty should be returned to us immediately and providing we have stocks we will either repair or replace them as quickly as possible (usually same day). This does not apply to oscilloscopes where we will arrange for collection from your door.



Technical Enquiries and Fault Finding

We very much regret we cannot answer technical enquiries by telephone so please write to us if you have any problems with our projects or components. Please keep technical enquiries separate from any other enquiry or order. Address your letter Technical Dept., Maplin Electronic Supplies Ltd., P.O. Box 3, Rayleigh, Essex. We will do our utmost to answer your enquiry within 2 weeks of our receiving it. We cannot answer queries which do not relate to items in our catalogue or "Electronics - The Maplin Magazine". We will also answer enquiries about "Electronics & Music Maker" projects, where we supply complete kits. Also we are unable to offer the service on projects where the kit has been discontinued for over one year. Priority will be given to those enquiries accompanied by a sae. Enquiries about projects appearing in magazines must be addressed to the magazine concerned. Before you write try to narrow down the fault; it's hard to help you if you just say it doesn't work, since in most cases the fault could be almost anything. Most designs follow a logical sequence, so if possible check to see if any parts of the circuit are operating correctly, and make a note of every test you make. You will undoubtedly require a multimeter and in audio circuits a crystal

earpiece can be useful as only the tip need be connected to enable you to hear what is happening throughout the circuit and the extremely high impedance of this monitor will not cause the existing conditions to change. Always check the power supply voltages and voltage rails in the circuit, and check that all points that should be at earth potential are correct, especially when you have several seemingly unconnected faults. Hums and buzzes are almost always caused by incorrect earthing, poor layout or interconnecting wires that are too long. Poor soldering is one of the most common causes of faults. Keep the soldering iron tip clean and free from build-ups of flux by wiping it on a damp rag or sponge, but ensure that it is always tinned (covered with a layer of molten solder - with a new iron, tin the new bit by wiping the molten solder over it with a piece of card or rag). It is most important that both sides of a joint are heated together by the iron. If one side is cold the flux from the solder will flow around it and insulate it from the other side, exactly the opposite to what is wanted. PLEASE NOTE THAT WE CANNOT ANSWER TECHNICAL ENQUIRIES BY TELEPHONE SO PLEASE DO NOT ASK.

HOW TO ORDER IF YOU LIVE OUTSIDE THE UK

Whenever possible, please use our order form. To order an item, you need write only the quantity you require and the five character code shown for that item, printed in bold type beside the word "Order". For resistors, write the code letter for the type you require and the resistance value - for more information see Resistor Section.

All prices in the catalogue (except items marked NV beside their price) include British VAT which you do not have to pay. However, for all addresses not in the UK, Isle of Man, Republic of Ireland or Channel Isles, we do charge for the carriage at cost. You must therefore send sufficient money to cover the cost of carriage. For Europe and surface post elsewhere, we recommend that you simply use our VAT inclusive price since in most cases, the VAT amount will pay your postage. However, on small orders this may not be sufficient, so if your total order value is under £15, please add £1 and if under £7 please add £2. On items marked NV, we suggest you add 25% as they are mostly books and therefore quite heavy. In addition, if there are any really heavy items like transformers or spray cans, we suggest you add an additional £3. If you are ordering an item marked "Delivery by Carrier" please contact us first for a quotation for carriage.

In any event, we will credit any money over. We can refund if you do not intend to order again, but we will deduct bank charges and so refunds for amounts under £1 will not be worthwhile.

If you require airmail, then please write "AIRMAIL" in large letters across your order. However, we will only send it by airmail if you have sent enough money to cover the postage. If there is insufficient money, we may send your order by surface mail, so please ensure you send enough. As a guide, airmail is about twice the price of surface mail. So add an extra 15% to everything and double any other suggested amount shown for surface mail if it is applicable to your order.

There are basically seven different ways in which you can send the money for your order to us. In all cases, cheques etc., should be made payable to Maplin Electronic Supplies Ltd.

1. Uniform Eurocheques

If you have a Eurocheque book, then simply write the amount in pounds sterling and sign the cheque. You can, if you wish, add a little more than you calculated, leave the amount blank, but write across the cheque "NOT MORE THAN £.....", then we can fill in the exact amount due and there will be no credits or refunds to consider; you will pay only exactly the amount due: the value of the goods actually despatched plus the carriage at cost. In all cases, you must write your Eurocheque guarantee card number on the back of the cheque.

2. Bank Draft

Go to any local bank and buy a bank draft drawn on a British bank for the exact amount in pounds sterling. We shall be able to despatch your goods on the day we receive your order because our money is guaranteed by the British bank printed on the draft.

3. Credit Card

If you have a Eurocard/Mastercard/Access, Visa/Carte Bleue or American Express Card, then simply write your card number on your order also stating which type of card it is and its expiry date and sign the order. Do not send your card with the order. We will be able to despatch your order immediately and you will be charged only the exact amount due.

4. Postal Orders and International Reply Coupons

We can accept Postal Orders provided they are in pounds sterling and issued in one of the following countries only:

Anguilla, Antigua, Ascension, Bahamas, Barbados, Belize, British Antarctic Territory, Brunei, Chatham Isles, Cook Isles, Dominica, Falkland Isles and Dependencies, Fiji, Gambia, Gibraltar, Grenada, Hong Kong, Malaysia, Malta, Montserrat, New Zealand, Nigeria, Niue Isle, Penrhyn Isle, Pitcairn Isle, St. Helena, St. Kitts – Nevis, St. Lucia, St. Vincent, Seychelles, Singapore, Tonga, Tortola, Trinidad and Tobago, Tristan da Cunha, Turks and Caicos Isles, Western Samoa, Yemen (except Kamaran Isles). Do not affix extra stamps to Postal Orders as the stamps have no value in the UK, unless they are actually current British Post Office issues.

For very small orders, catalogues and magazines we can accept International Reply Coupons (IRC). Each IRC is worth 22p.

5. Currency.

We can accept currency (but no coins) only if sent by registered post at your risk.

6. C.O.D.

We can send goods Cash on Delivery to the following countries: Algeria, Anguilla, Antigua and Barbuda, Austria, Azores, Bahamas, Barbados, Belgium, Belize, British Virgin Isles, Brunei, Cayman Isles, Corsica, Cyprus, Czechoslovakia, Denmark, Dominica, Egypt, Falkland Isles and Dependencies, Farøe Isles, Fiji, Finland, France, Gibraltar, Guyana, Hong Kong, Hungary, Iceland, Iraq, Italy, Jamaica, Liechtenstein, Luxembourg, Madeira, Malawi, Malaysia, Malta, Mauritius, Monaco, Montserrat, Netherlands, Nevis, Nigeria, Norway, Portugal, St. Kitts, St. Lucia, St. Vincent and the Grenadines, San Marino, Seychelles, Sierra Leone, Singapore, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Trinidad and Tobago, Tunisia, West Germany.

You will be charged for the goods despatched and the C.O.D. charge at cost. At present the C.O.D. charge is £2.40 per £200.

You must write C.O.D. in large letters across your order.

7. Letter of Credit

If you cannot use any of the above methods, then usually the only other method we can accept is the "irrevocable Letter of Credit". Again, this can be arranged through any bank, part-shipment and trans-shipment must be allowed and you must pay all charges. Using this system, we do not receive payment until the goods are despatched, but it is a very slow system and because of the large amount of documentation, we cannot accept it with orders worth less than £750.

Please do not use any other form of payment without our prior consent. In particular, we cannot accept Money Orders or personal cheques except Uniform Eurocheques. In any event, please write on your order which method of payment you are using.

COMMENT PASSER VOTRE COMMANDE SI VOUS RESIDEZ HORS DU ROYAUME-UNI

Veillez, dans la mesure du possible, utiliser notre bon de commande. Pour commander un article, il vous suffit d'inscrire la quantité requise et le code de cinq lettres indiqué pour l'article; écrivez en gros caractères à côté du mot "Order". Dans le cas des Résistances, inscrivez le code en lettres du modèle désiré ainsi que sa valeur - pour tout renseignement complémentaire, voir la Section des Résistances.

Tous les prix de ce catalogue (sauf les articles portant la mention "NV" à côté du prix) comprennent la TVA britannique dont vous n'êtes pas passible. Cependant, pour toutes les adresses en dehors du Royaume - Uni, de l'île de Man, de l'Irlande du Sud ou des îles de la Manche, le port reste dû au prix coûtant. Veuillez donc nous envoyer suffisamment d'argent pour couvrir les frais d'envoi. Pour l'Europe et pour d'autres destinations par courrier maritime, nous vous recommandons d'acquitter le prix inclusif de la TVA puisque dans la majorité des cas le montant de la TVA équivaut à celui de votre affranchissement. Mais il arrive dans le cas de petites commandes que ce montant ne suffise pas: si la valeur totale de votre commande est inférieure à £15, veuillez ajouter £1; et si elle est inférieure à £7, ajoutez £2. Pour les articles portant la mention "NV", nous vous suggérons de compter une majoration de 25% parce qu'il s'agit essentiellement de livres et que le poids est par conséquent important. En outre, si vous commandez des articles vraiment lourds comme des transformateurs ou des arrosoirs, nous suggérons que vous nous adressiez £3 supplémentaires.

Dans tous les cas, si le montant envoyé est excessif, nous vous créditerons la différence. Nous pouvons vous le rembourser si vous ne souhaitez pas repasser de commande, mais nous déduisons la commission de la banque: des remboursements sur des montants inférieurs à £1 ne sont donc pas viables.

Si vous désirez un envoi par courrier aérien, veuillez écrire "AIRMAIL" en grands caractères en travers de votre commande. Nous ne vous adresserons cependant votre article par courrier aérien que si vous nous avez envoyé suffisamment d'argent pour couvrir l'affranchissement. Autrement, nous vous le ferons parvenir par voie maritime. Veuillez donc vous assurer que vous nous envoyez les sommes nécessaires. A titre indicatif, le courrier aérien coûte environ deux fois le prix du courrier de surface. Ajoutez donc un supplément de 15% pour l'ensemble et doublez tout autre montant suggéré indiquant le tarif du courrier de surface.

Il existe essentiellement sept manières différentes de nous régler le montant de votre commande. Dans tous les cas, les chèques et autres documents doivent être rédigés à l'ordre de Maplin Electronic Supplies Ltd.

1. Eurochèques Uniformes

Si vous avez un carnet d'Eurochèques, inscrivez simplement le montant en livres sterling et signez le chèque. Si vous le désirez, vous pouvez laisser le montant en blanc tout en écrivant en travers du chèque: "NOT MORE THAN £....."; nous pouvons ensuite remplir le montant exact, supprimant ainsi tout crédit ou remboursement; vous ne paierez que le montant exact de la somme due: la valeur des marchandises délivrées plus les frais de transport. Quelle que soit la méthode choisie, vous devez inscrire le numéro de votre carte de garantie Eurochèque au dos de votre chèque.

2. Traite Bancaire

Achetez dans la banque la plus proche une traite bancaire prélevée sur une banque britannique pour le montant exact en livres sterling. Nous

pourrons vous envoyer vos marchandises le jour même où nous recevrons votre commande parce que notre argent se trouve garanti par la banque britannique dont le nom figure sur la traite.

3. Carte de Crédit

Si vous avez l'une des cartes de crédit suivantes, Eurocard/Mastercard/Access, Visa/Carte Bleue ou American Express, il vous suffit d'indiquer le numéro de votre carte sur votre commande ainsi que le nom de la carte et la date d'expiration et de signer la commande. N'envoyez pas votre carte avec la commande. Nous pourrons vous adresser immédiatement vos marchandises et vous n'aurez que le montant exact de la somme due à payer.

4. Mandats Postaux et Coupon-Réponse Internationaux

Nous acceptons les Mandats Postaux à conditions qu'ils soient exprimés en livres sterling et proviennent d'un pays listé sous l'entête Mandats Postaux à cette page. Nous vous renvoyons à cette Section pour un complément d'information. Pour de très petites commandes, de catalogues ou magazines, nous acceptons les Coupons-Réponse Internationaux (CRI). Ceux-ci valent 22 pence pièce.

5. Argent Liquide

Nous acceptons l'argent liquide (mais pas les pièces) à condition qu'il soit envoyé en recommandé et à vos risques.

6. Paiement à la Livraison

Nous pouvons envoyer des marchandises avec Paiement à la Livraison dans la plupart des pays d'Europe. Vous aurez à payer la valeur de la marchandise livrée, les frais de port au prix coûtant et les frais de Paiement à la Livraison également au prix coûtant. Actuellement ces derniers frais s'élèvent à £2.40 pour 200. Vous devrez inscrire les lettres "C.O.D." (cash on delivery) en grands caractères en travers de votre commande. Le régime de Paiement à la Livraison ne s'applique pas aux pays européens suivants: l'Albanie, Andorre, les îles Baléares, la Bulgarie, les îles Canaries, les îles du Cap Vert, l'Allemagne de l'Est, la Grèce, le Groenland, la Pologne, la Roumanie, l'Espagne, le Spitzbergen, la Turquie, l'URSS, l'Etat du Vatican et la Yougoslavie.

7. Lettre de Crédit

Si vous ne pouvez pas utiliser les solutions indiquées ci-dessus, il reste une dernière possibilité acceptable qui est la "Lettre irrévocable de Crédit". Là encore, vous pourrez utiliser n'importe quelle banque comme intermédiaire. La Lettre de Crédit doit être ouverte pour six mois, confirmée par une banque londonienne, le transbordement doit être prévu et vous devez vous acquitter de tous les frais bancaires. Avec ce système nous ne recevons notre paiement qu'à l'envoi des marchandises, mais c'est une solution très lente et en raison des frais de documentation élevés, nous ne l'acceptons que pour des commandes de plus de £750.

Nous vous prions de ne pas utiliser d'autres formes de versement sans nous consulter au préalable. En particulier, nous ne pouvons pas accepter de mandat ni de chèque personnel à l'exception d'Eurochèques. Quel que soit votre mode de règlement, veuillez l'indiquer sur votre commande.

BESTELLUNGEN AUS DEM AUSLAND

Bitte benutzen Sie möglichst immer unsere Bestellformulare. Um einen Artikel zu bestellen, schreiben Sie einfach die von Ihnen benötigte Anzahl und den aus fünf Schriftzeichen bestehenden Code für diesen Artikel nieder, der in fetter Schrift neben dem Wort "Order" erscheint. Für Widerstände den Code-Buchstaben für den von Ihnen benötigten Typ und den Widerstandswert niederschreiben – weitere Angaben siehe Abschnitt "Widerstand".

Alle in diesem Katalog enthaltenen Preise (ausgenommen Artikel mit der Bezeichnung "NV" neben ihrem Preis) verstehen sich einschließlich britischer Mehrwertsteuer, die Sie nicht zu zahlen brauchen. Für alle Anschriften außerhalb Großbritanniens, der Insel Man, der Republik Irland oder der Kanalinseln berechnen wird jedoch die Transportgebühren zum Selbstkostenpreis. Sie müssen daher genügend Geld mitschicken, um die Transportkosten zu decken. Für Europa und gewöhnliche Post anderswo empfehlen wir, daß Sie einfach unseren Gesamtpreis einschließlich MwSt benutzen, da der Mehrwertsteuerbetrag in den meisten Fällen Ihre Portokosten deckt. Bei Kleinaufträgen ist das evtl. jedoch nicht ausreichend; beträgt Ihr Gesamtauftragswert also unter £15, bitte £1 hinzurechnen, und bei weniger als £7, bitte £2 hinzurechnen. Für mit "NV" bezeichnete Artikel empfehlen wir, daß Sie 25% hinzurechnen, da es sich meistens um Bücher handelt, die daher ziemlich schwer sind. Außerdem empfehlen wir, daß Sie für alle wirklich schweren Artikel wie Transformatoren oder Sprühdosen weitere £3 hinzurechnen.

Falls Sie zuviel Geld schicken, schreiben wir Ihnen den Überschub sowieso gut. Sollten Sie nicht wiederbestellen wollen, können wir Ihnen den Überschub erstatten; in diesem Fall werden jedoch Bankspesen abgerechnet, so daß Erstattungen für Beträge unter £1 sich nicht lohnen.

Falls Sie den Versand per Luftpost benötigen, schreiben Sie bitte "AIRMAIL" in großen Buchstaben über Ihre Bestellung. Wir versenden jedoch nur per Luftpost, wenn Sie genügend Geld für das Luftpostporto geschickt haben. Reicht das Geld nicht aus, können wir Ihre Bestellung mit gewöhnlicher Post versenden; also sicherstellen, daß Sie genug schicken. Als allgemeine Richtschnur mag gelten, daß Luftpost etwa zweimal so teuer ist wie gewöhnliche Post. Also für alles zusätzliche 15% hinzurechnen und jeden anderen empfohlenen, für gewöhnliche Post aufgezeigten Betrag verdoppeln, falls für Ihre Bestellung zutreffend.

Es gibt grundsätzlich sieben verschiedene Arten, auf die Sie das Geld für Ihren Auftrag an uns senden können. In allen Fällen sind Schecks usw. an Maplin Electronic Supplies Ltd. zahlbar zu machen.

1. Einheitliche Euroschecks

Wenn Sie ein Euroscheckbuch haben, schreiben Sie einfach den Betrag in Pfund Sterling auf und unterzeichnen den Scheck. Falls Sie es wünschen, können Sie etwas mehr als von Ihnen errechnet hinzurechnen: dazu lassen Sie den Betrag offen, schreiben jedoch über den Scheck "NOT MORE THAN £.....", und wir können dann den genauen fälligen Betrag einsetzen, und es brauchen keine Gutschriften oder Rückerstattungen berücksichtigt werden. Sie zahlen nur genau den Betrag, der fällig ist, d.h. den Wert der effektiv versandten Waren zuzüglich Transportgebühren zum Selbstkostenpreis. In allen Fällen müssen Sie Ihre Euroscheck-Garantiekartenummer auf die Rückseite des Schecks schreiben.

2. Bankwechsel

Gehen Sie zu irgendeiner Bank am Platze und kaufen Sie einen auf eine britische Bank für den

genauen Betrag in Pfund Sterling gezogenen Bankwechsel. Wir können Ihre Waren dann an dem Tag zum Versand bringen, an dem wir Ihren Auftrag erhalten, da unser Geld durch die auf den Wechsel aufgedruckte britische Bank garantiert ist.

3. Kreditkarte

Falls Sie eine Eurocard/Mastercard/Access, Visa/Carte Bleue oder American Express Karte haben, schreiben Sie einfach Ihre Kartennummer auf Ihre Bestellung, die Art der Karte und ihr Verfallsdatum, und unterzeichnen den Auftrag. Nicht Ihre Karte mit der Bestellung mitschicken. Wir können Ihre Bestellung sofort zum Versand bringen, und Ihnen wird nur der genaue fällige Betrag berechnet.

4. Postanweisungen und Postantwortscheine

Wir können Postanweisungen mit der Maßgabe annehmen, daß sie in Pfund Sterling und in einem Land ausgestellt sind, das unter der Überschrift Postal Orders auf Seite 20 aufgeführt ist. Wegen weiterer Informationen bitte ebenfalls auf diesen Abschnitt Bezug nehmen. Für sehr kleine Aufträge, Kataloge und Magazine können wir internationale Postantwortscheine (IRC) annehmen. Jeder IRC hat einen Wert von 22 Pence.

5. Zahlungsmittel

Wir können Zahlungsmittel (jedoch keine Münzen) nur dann annehmen, wenn sie auf Ihr Risiko per Einschreiben geschickt werden.

6. Zahlung bei Lieferung

Wir können Waren gegen Zahlung bei Lieferung an die meisten europäischen Länder versenden. Ihnen werden die versandten Waren, die Transportgebühren zum Selbstkostenpreis und die Nachnahmegebühr zum Selbstkostenpreis berechnet. Gegenwärtig beträgt die Nachnahmegebühr £2.40 pro £200. Sie müssen C.O.D. in großen Buchstaben über Ihre Bestellung schreiben. Wir können keine Nachnahmesendungen zu folgenden europäischen Ländern vornehmen: Albanien, Andorra, Balearen, Bulgarien, Kanarische Inseln, Kap Verdische Inseln, Ostdeutschland, Griechenland, Grönland, Polen, Rumänien, Spanien, Spitzbergen, Türkei, Sowjetunion, Vatikanstadt und Jugoslawien.

7. Akkreditiv

Können Sie keine der vorstehenden Methoden benutzen, bleibt gewöhnlich als einzige andere, für uns akzeptable Methode das "unwiderrufliche Akkreditiv", das wiederum durch jede beliebige Bank eröffnet werden kann. Das Akkreditiv muß sechs Monate lang offen sein, durch eine Londoner Bank bestätigt sein, Teillieferungen und Umladungen müssen erlaubt sein, und Sie müssen alle Gebühren bezahlen. Bei Anwendung dieses Zahlungsmodus erhalten wir das Geld erst nach erfolgtem Versand der Waren. Es ist jedoch ein überaus langsames Verfahren, und wegen des großen Umfangs von Dokumenten können wir diese Zahlungsart nur für Bestellungen im Werte von weniger als £750 annehmen.

Bitte ohne unsere vorherige Zustimmung keine andere Zahlungsart benutzen. Insbesondere können wir keine Postanweisungen oder persönliche Schecks, ausgenommen einheitliche Euroschecks, annehmen. Schreiben Sie bitte in jedem Fall auf Ihre Bestellung, welche Zahlungsart sie benutzen.

COME ORDINARE SE NON RISIEDETE NEL REGNO UNITO

Qualora possibile, usate sempre il nostro Modulo di Ordine. Per ordinare un articolo basta solo scrivere il numero di esemplari che desiderate e il codice a cinque caratteri che designa detto articolo, scritto a grandi caratteri accanto alla parola "Order". Per i resistori, scrivete la lettera di codice che designa il tipo che desiderate e il grado di resistenza; se desiderate ulteriori informazioni siete pregati di consultare la parte dedicata ai resistori.

Tutti i prezzi contenuti nel presente catalogo (eccetto quelli che accanto al prezzo portano la dicitura "NV"), comprendono l'IVA britannica, che non siete tenuti a pagare. D'altra parte, per tutti gli indirizzi che non siano nel Regno Unito, Isola di Man, Eire o Isole Normanne, fatturiamo la spedizione a prezzo di costo. Dovrete quindi inviare una somma sufficiente a coprire le spese postali. Per l'invio postale in Europa o via terra o mare dovunque, dovrete saldare il nostro prezzo comprendente l'IVA, dato che nella maggior parte dei casi il sovrapprezzo IVA coinciderà con le spese di spedizione. Per le piccole ordinazioni, però questa somma potrebbe non bastare, e di conseguenza se il valore dell'intero ordine è inferiore a £15, preghiamo di aggiungere una sterlina, se inferiore a £7, preghiamo aggiungere 2 sterline. Per gli articoli contrassegnati con "NV", suggeriamo di aggiungere il 25%, dato che si tratta per lo più di libri, che sono molto pesanti. Inoltre, nel caso di articoli veramente pesanti come trasformatori o barattoli spruzzavermice, suggeriamo di aggiungere 3 sterline.

In ogni caso vi accrediteremo la somma eventualmente in eccesso. Potremo rimborsarla se non intendete passare altri ordini, ma deuremo le spese bancarie, e di conseguenza non verranno la spesa i rimborsi di somme inferiori a 1 sterlina.

Se desiderate l'invio per via aerea, scrivete "AIRMAIL" a grandi caratteri sull'ordine. Ad ogni modo effettueremo la spedizione per via aerea solo se avrete inviato denaro sufficiente per le spese. Se la somma non sarà sufficiente, potremo effettuare la spedizione in superficie; di conseguenza accertatevi di inviare una somma sufficiente. Come guida, aggiungete il 15% ad ogni articolo e raddoppiate le somme suggerite per la spedizione in superficie, se applicabile al vostro ordine.

Ci sono sette modi diversi per inviarci il denaro relativo al vostro ordine. In ogni caso, assegni ecc devono essere emessi a favore di Maplin Electronic Supplies Ltd.

1. Eurocheques Uniformi

Se siete in possesso di un libretto di Eurocheques, basterà scrivere la somma in lire sterline e firmare l'assegno. Se lo desiderate, potrete aggiungere un po' più di quanto avete calcolato, lasciare la cifra in bianco, ma scrivere attraverso l'assegno "NON PIU' DI £st....."; potrete allora scrivere noi stessi la somma dovuta, e in tal modo non ci saranno da calcolare crediti né rimborsi; pagherete solo la cifra esattamente dovuta: il valore delle merci effettivamente spedite, più la spedizione a prezzo di costo. In ogni caso, sarete tenuti a scrivere sul retro dell'assegno il numero della vostra carta di garanzia dell'Eurocheque.

2. Cambiale Bancaria

Recatevi in una banca qualsiasi e acquistate una cambiale bancaria spiccata su una banca britannica per l'ammontare esatto in sterline. Potremo spedirvi la merce il giorno stesso in cui riceveremo l'ordine, in quanto il pagamento è garantito dalla banca britannica il cui nome figura sul documento.

3. Carta di Credito

Se siete in possesso di una Eurocard/Mastercard/Access, Visa/Carte Bleue o American Express Card, scrivete semplicemente il numero della vostra carta sull'ordine, precisando anche di quale tipo di carta si tratta e la data di scadenza, e firmate l'Ordine. Non spedite la carta con l'ordine. Potremo spedirvi la merce immediatamente, e vi sarà addebitata esattamente la somma dovutaci.

4. Vaglia Postali e Cuponi Internazionali di Risposta

Possiamo accettare vaglia postali a condizione che siano in sterline e emessi in un paese il cui nome compaia in un elenco intitolato "POSTAL ORDERS" a pagina 20. Consultate quella parte per ulteriori informazioni. Per ordini di valore molto esiguo, cataloghi e riviste, possiamo accettare cuponi internazionali di risposta (IRC) ognuno dei quali vale 22p.

5. Valuta

Possiamo accettare valuta (ma non monete) solo se spedita per raccomandata, e a vostro rischio.

6. Pagamento Alla Consegna

Possiamo spedire merci con pagamento alla consegna nella maggior parte dei paesi europei. Vi fattureremo le merci spedite, la spedizione a prezzo di costo e la tariffa di riscossione alla consegna pure a prezzo di costo. Al momento attuale la tariffa è di £st 2,40 per £st 200. Non possiamo spedire con pagamento alla consegna nei seguenti paesi europei: Albania, Andorra, Isole Baleari, Bulgaria, Isole Canarie, Isole del Capo Verde, Germania Orientale, Grecia, Groenlandia, Polonia, Romania, Spagna, Spitzbergen, Turchia, URSS, Stato Città del Vaticano e Jugoslavia.

7. Lettera di Credito

Se non avete la possibilità di usare uno dei modi sopra menzionati, l'unico altro modo che generalmente possiamo accettare è una "lettera di credito irrevocabile". Anche questo potrà farsi a mezzo di qualsiasi banca. La Lettera di Credito deve rimanere valida per sei mesi, confermata da una banca di Londra, deve consentire la spedizione parziale e il trasbordo, e sarete tenuti a pagare tutte le spese. Con questo sistema non riceviamo il pagamento fino a dopo la spedizione delle merci, ma si tratta di un sistema molto lento, e dato il gran numero di documenti occorrenti non potremo accettarlo per ordini di valore inferiore a £st 750.

Siete pregati di non usare altra forma di pagamento, senza nostra previa autorizzazione. In particolare non possiamo accettare mandati di pagamento né assegni personali, eccetto Eurocheques Uniformi. In ogni caso, siete pregati di scrivere sull'ordine il modo di pagamento scelto.

MANIER VAN BESTELLEN ALS MEN BUITEN GROOT-BRITANNIE WOONT

Indien mogelijk, gelieve ons orderformulier te gebruiken. Voor het bestellen van een artikel geeft men uitsluitend de verlangde hoeveelheid op en de voor het artikel opgegeven 5-teken code, die in dikke letters achter het woord "Order" staat. Voor weerstanden schrijft men de codeletter voor het verlangde type en de weerstandswaarde. Voor verdere informatie zie het deel over Weerstanden.

Alle prijzen in deze catalogus (behalve artikelen met "NV" naast de prijs) zijn met inbegrip van de Britse VAT (BTW), die niet door U betaald hoeft te worden. Maar voor alle adressen buiten het Verenigd Koninkrijk, het Eiland Man, Ierland of de Kanaal Eilanden, wordt het transport tegen kostprijs berekend. Het is daarom noodzakelijk dat u voldoende geld stuurt voor betaling van de transportkosten. Voor Europa en de normale post elders, adviseren wij onze inclusieve VAT (BTW) prijs te gebruiken, daar in de meeste gevallen het VAT (BTW)-bedrag de portokosten dekt. Voor kleine orders is dit soms echter niet voldoende, als uw order dus voor minder dan £15 is, gelieve £1 extra over te maken en onder £7, £2 extra. Voor artikelen gemerkt "NV" adviseren wij 25% extra te zenden, daar dit meestal boeken zijn en dus vrij zwaar. Ingeval van extra zware artikelen, zoals b.v. transformatoren of spuitbussen, dan adviseren wij £3 extra te sturen.

Wanneer u teveel zendt, crediteren wij u voor het teveel. Als u niet nog eens wilt bestellen, kunnen wij het bedrag retourneren, onder aftrek van de bankkosten, het vergoeden van bedragen onder £1 is dus niet de moeite waard.

Wilt u verzending per luchtpost, schrijf dan met grote letters "AIRMAIL" dwars over uw order. Wij verzenden uitsluitend per luchtpost als u voldoende overmaakt om de kosten te dekken. Is het bedrag niet voldoende, dan is het mogelijk dat wij uw order met de gewone post verzenden. Als richtlijn: luchtpost is ongeveer tweemaal zo duur als de gewone post. Tel dus een extra 15% bij alles op en neem het dubbele bedrag dat voor de gewone post staat aangegeven als het van toepassing is op uw order.

Er zijn eigenlijk zeven verschillende manieren waarop u het bedrag voor uw order aan ons kunt overmaken. In alle gevallen moeten de cheques enz. uitgemaakt worden aan Maplin Electronic Supplies Ltd.

1. Normale Eurocheques

Als u in het bezit bent van een Eurochequeboek, schrijf dan het bedrag in Pond Sterling en teken de cheque. Als u wilt kunt u iets meer dan u berekend had erbij optellen, het bedrag open laten, maar dan schrijft u dwars over de cheque "NOT MORE THAN £.....". Wij kunnen dan het juiste bedrag invullen en crediteren of terug betalen wordt hierdoor vermeden: u betaalt uitsluitend de waarde van de goederen die verzonden worden plus de juiste verzendingskosten. In alle gevallen schrijft u achterop uw Eurocheque het Eurocheque garantiekaartnummer.

2. Bankwissel

Bij een lokale bank koopt u een bankwissel getrokken op een Britse bank voor het juiste bedrag in Pond Sterling. Wij kunnen dan uw goederen versturen op de dag dat wij uw order ontvangen want ons geld is gegarandeerd door de Britse bank die op de wissel vermeld staat.

3. Kredietkaart

Bent u in bezit van een Eurocard/Mastercard/Access, Visa/Carte Bleue of American Express kaart, dan schrijft u het nummer van uw kaart op uw order plus het type kaart en de vervaldag ervan en teken de order. Niet uw kaart met de order verzenden. Wij kunnen uw order meteen versturen en u wordt uitsluitend het juiste bedrag berekend.

4. Postwissels en Internationale Antwoordcoupons

Wij accepteren postwissels als ze in Pond Sterling zijn uitgemaakt en uitgegeven in een land vermeld onder het opschrift Postal Orders op pagina 20. Zie de verdere informatie in dat deel. Voor heel kleine orders, catalogi en tijdschriften accepteren wij ook Internationale Antwoordcoupons. Ieder coupon is 22p waard.

5. Valuta

Wij accepteren valuta (maar geen munten) uitsluitend indien verzonden op uw risico per aangetekende post.

6. Rembours

Wij kunnen de goederen naar de meeste landen van Europa onder rembours verzenden. U wordt de prijs van de goederen berekend plus de kostprijs voor de verzending en het Remboursstarief. Momenteel bedragen de rembourskosten £2,40 per £200. Schrijf C.O.D.

in grote letters dwars over uw order.

Rembourszending is mogelijk naar de volgende Europese landen: Albanië, Andorra, Balearen, Bulgarije, Canarische Eilanden, Griekenland, Groenland, Joegoslavië, Kaap Verde Eilanden, Oost Duitsland, Polen, Roemenië, Spanje, Spitsbergen, Turkije, U.S.S.R en de Vaticaanse Stad.

7. Kredietbrief

Als het niet mogelijk is een van de bovenstaande methoden te gebruiken, dan is gewoonlijk de enige andere voor ons accepteerbare manier de "onherroepelijke kredietbrief". Dit kan door iedere bank geregeld worden. De kredietbrief moet een looptijd van zes maanden hebben, bevestigd door een bank in Londen, Gedeeltelijke verzending en overlading moet geoorloofd zijn en u bent verantwoordelijk voor alle kosten. Als u dit systeem gebruikt, ontvangen wij geen betaling totdat de goederen verzonden zijn, maar het is een uiterst langzaam systeem en vanwege de grote hoeveelheid documentatie, kunnen wij dit systeem niet accepteren voor orders beneden de £750.

Gelieve geen andere vorm van betaling te gebruiken zonder onze voorafgaande toestemming. Vooral postwissels of persoonlijke cheques met uitzondering van de Normale eurocheques, kunnen wij niet accepteren. Schrijft u in ieder geval uw methode van betaling op uw order.

SLIK BESTILLER DE OM DE BOR UTENFOR STORBRIANNIA

Bruk alltid vår bestillingsseddel om mulig. For å spesifisere en artikkel skriver De ganske enkelt det antall De ønsker og fem-tegns koden som står oppgitt for artikkelen, trykt med uthevet tekst ved siden av ordet "Order". For motstander skriver De kodebokstaven for den type De ønsker, sammen med motstandsverdien. Se avsnittet om motstander for nærmere opplysninger.

Alle priser i denne katalogen (unntatt artikler merket "NV" ved siden av prisen) inkluderer VAT (Britisk m.v.a.), som De ikke behøver å betale. Men vi debiterer våre kunder det frakten koster hvor varene sendes til en adresse utenfor Storbritannia, øyen Man, Eire eller Kanaløyene. De må derfor sende nok til å dekke fraktkostningene i tillegg til selve prisen. For Europa og vanlig forsendelse (ikke med fly) til andre steder, foreslår vi at De betaler den oppgitte pris, som altså inkluderer VAT, fordi VAT-beløpet og frakten i de fleste tilfelle utligner hverandre. Men ved mindre bestillinger kan dette ikke være nok, så hvis De bestiller for mindre enn £15 i alt, ber vi Dem legge til £1, og ved bestillinger på under £7, ber vi Dem legge til £2. For artikler merket "NV", bør De legge til 25% fordi de fleste av disse er bøker, og derfor forholdsvis tunge. Hvis De bestiller noen riktig tunge artikler, som f.eks. transformatorer eller sprayboks, bør De legge til ytterligere £3.

Hvis De sender for meget, krediterer vi Deres konto. Hvis De ikke ønsker å bestille noe mer senere, refunderer vi forskjellen, men vennligst vær oppmerksom på at vi da trekker fra bankomkostninger. Det betyr at beløp under £1 ikke blir refundert.

Hvis De ønsker at varene skal sendes med luftpost, må De skrive "AIRMAIL" med store, tydelige bokstaver tvers over ordren. Vi skal da sende varene med luftpost, men bare hvis De har sendt nok penger til å dekke porto. I motsatt fall sender vi varene på vanlig, billigste måte, så forviss Dem om at De sender nok. Som en veileder gjelder det at luftpost normalt koster det dobbelte av vanlig post. Så legg 15% ekstra til det hele, og deretter det dobbelte av ethvert annet beløp som står foreslått for vanlig post, hvis dette er aktuelt for Deres bestilling.

Stort sett kan De betale en bestilling på syv forskjellige måter. Alle sjekker e.l. gjøres betalbare til Maplin Electronic Supplies Ltd.

1. Vanlige Eurosjekker

Hvis De benytter Eurosjekker, skriver De ganske enkelt beløpet i pund sterling og underskriver sjekken. Hvis De ønsker det, kan De legge til litt det beløpet De har regnet ut, la beløpet på selve sjekken stå åpent, men skrive tvers over sjekken "NOT MORE THAN £.....", og vi fyller så inn det nøyaktige beløpet. På denne måten unngår De å betale for mye eller for lite. Glem ikke å skrive Deres Eurosjekk garantinr. på baksiden av sjekken.

2. Banktratte

Kjøp en banktratte hos Deres egen bank, trukket på en britisk bank, som lyder på det nøyaktige beløp i pund sterling. Vi kan da sende varene samme dag vi mottar Deres bestilling, fordi beløpet er garantert av den britiske banken som står oppgitt på tratten.

3. Kredittkort

Hvis De har Eurocard/Mastercard/Access, Visa/Carte Bleue eller American Express Card, skriver De ganske enkelt Deres kortnummer på ordren, med opplysning om korttype og kortets utløpsdato. Skriv så under ordren. Vi kan da sende varene omgående, og De belastes bare det nøyaktige beløpet.

4. Postanvisninger og Internasjonale Svarkuponger

Vi tar i mot postanvisninger, forutsatt at disse er utstedt i pund sterling, og utstedt i et land som står oppført under overskriften Postal Orders på side 20. Se det avsnittet for nærmere opplysninger. For meget små bestillinger, kataloger og tidsskrifter tar vi i mot internasjonale svarkuponger. Hver slik kupong er verd 22 pence.

5. Penger/Valuta

Vi kan ta i mot penger/valuta (men ikke mynter) - men utelukkende hvis disse sendes rekommendert og på Deres risiko.

6. Kontant ved Levering

Vi kan sende varer kontant ved levering (pr. etterkrav) til de fleste europeiske land. De vil da bli belastet det varene koster, porto/frakt og omkostningene ved etterkrav. For tiden er disse omkostningene £2.40 pr. £200. De må skrive C.O.D. med store bokstaver tvers over bestillingen. Vi kan ikke sende varer mot etterkrav til følgende land i Europa: Albania, Andorra, Balearene, Bulgaria, Kanariøyene, Kapp Verdeøyene, Øst-Tyskland, Hellas, Grønland, Polen, Romania, Spania, Svalbard, Tyrkia, Sovjet, Vatikanstaten og Jugoslavia.

7. Remburs

Hvis De ikke kan benytte noen av betalingsmåtene nevnt over, er den eneste alternative betalingsmåte vi normalt kan akseptere den som kalles "ugjenkallelig remburs". Dette ordnes også gjennom Deres bank. Rembursen må gjelde i seks måneder, være bekreftet av en bank i London, og del-forsendelse og omskipning kan komme på tale, og De må betale alle omkostninger. Ved remburs får vi ikke betaling før varene er levert, men på grunn av alt papirarbeidet forbundet med denne betalingsmåten, og fordi det tar lang tid å få pengene, kan vi dessverre ikke akseptere remburs i f.m. ordrer til et beløp under £750.

Vi ber Dem om ikke å betale på noen annen måte, uten at vi er blitt enige om det på forhånd. Vi ber Dem huske at vi ikke kan ta i mot det som på engelsk kalles Money Order, eller private sjekker - unntatt vanlige Eurosjekker. Vi ber Dem skrive på bestillingen hvilken betalingsmåte De ønsker å benytte.

VID BESTÄLLNING FRÅN ANDRA LÄNDER ÄN STORBRIANNIEN

Använd alltid vår orderblankett, när så är möjligt. För att beställa en artikel behöver man bara ange önskad mängd och den beteckning i fem bokstäver/siffror som upptas för denna artikel, tryckt i tjock stil bredvid ordet "Order". För resistorer skriver man kodbokstaven för önskad typ och resistansvärde - se Resistorsektionen för ytterligare information.

Brittisk mervärdesskatt är inräknad i alla priser i denna katalog (utom artiklar som är märkta med "NV" bredvid priset), men den behöver inte betalas. Däremot måste portot betalas för alla adresser utanför Storbritannien, Isle of Man, Irland och Channel Isles. Var därför vänlig och skicka ett tillräckligt belopp för att täcka portokostnaden. För Europa och all post som inte går med flyg föreslår vi att kunden helt enkelt betalar priset med inräknad mervärdesskatt, eftersom mervärdesskatten betalar porto i de flesta fall. Men vid små beställningar kan det bli otillräckligt, så var vänlig och lägg till £1 om hela kostnaden understiger £15 och £2 om kostnaden understiger £7. Vi föreslår ett tillägg på 25% för artiklar som är märkta med "NV", eftersom det för det mesta är böcker och därför väger mycket. Dessutom föreslår vi ett tillägg på ytterligare £3 för riktigt tunga artiklar som transformatorer och besprutare.

I vilket fall som helst krediteras överskottet till kunden, om beloppet är för stort. Vi kan betala tillbaka överskottet, om kunden inte tänker skicka in fler beställningar, men vi drar av bankkostnader, så belopp under £1 lönar sig inte.

Avsändning sker med flygpost, om kunden skriver "AIRMAIL" med stora bokstäver tvärs över beställningen och endast om tillräcklig betalning erlagts för att täcka kostnaden. Om betalningen är otillräcklig, postas beställningen med yttransport, så var vänlig och se till att betalningen räcker till. I regel kostar flygpost ungefär dubbelt så mycket som yttransport, så lägg till 15% för allt och fördubbla alla belopp för yttransport, om så behövs.

Det finns sju olika sätt att skicka in betalningen. Checker etc. ska alltid vara ställda på Maplin Electronic Supplies Ltd.

1. Enhetliga Eurocheck

Om kunden har en Eurocheckbok, så var vänlig och skriv helt enkelt summan i pund Sterling och skriv under checken. Om så önskas, kan man lägga till lite mer än beräknat; fyll i så fall inte i summan utan skriv tvärs över checken "NOT MORE THAN", så kan vi fylla i den exakta kostnaden och det blir ingen kredit eller återbetalning; kunden betalar bara den exakta kostnaden: värdet på de avsända artiklarna plus porto. Kunden måste alltid skriva numret på Eurocheck-garantikortet på checkens baksida.

2. Bankcheck

Gå till närmaste bank och köp en bankcheck dragen på en brittisk bank och med det exakta beloppet utskrivet i pund Sterling. Vi kan då expediera beställningen samma dag vi erhåller den, eftersom våra pengar garanteras av den brittiska bank som finns på checken.

3. Kreditkort

Om kunden har Eurocard/Mastercard/Access, Visa/Carte Bleue eller American Express, så var vänlig och skriv helt enkelt kortnumret på beställningen och ange vilken sorts kort det är samt "expiry date" och skriv under beställningen. Skicka inte kortet med beställningen. Vi kan expediera beställningen genast och kunden behöver bara betala den exakta kostnaden.

4. Postanvisningar och Internationella Svarkuponger

Vi godtar postanvisningar förutsatt att de är utskrivna i pund Sterling och att de har utfärdats i ett land som finns med i listan under överskriften Postal Orders på sid 20. Se även den sektionen för ytterligare information. För mycket små beställningar, kataloger och tidskrifter kan vi godtaga internationella svarkuponger (IRC). Varje IRC är värd 22 pence.

5. Kontanter

Vi kan godtaga sedlar (men inga mynt) bara om de skickas rek på kundens egen risk.

6. Postförskott

Vi kan sända beställningar mot postförskott till de

flesta europeiska länder. Kunden debiteras för avsända artiklar, porto och postförskottsavgiften. För närvarande är postförskottsavgiften £2.40 per £200. Kunden måste skriva C.O.D. med stora bokstäver tvärs över beställningen. Vi kan inte sända mot postförskott till följande europeiska länder: Albanien, Andorra, Baleariska öarna, Bulgarien, Kanarieöarna, Cap Verde-öarna, Östtyskland, Grekland, Grönland, Polen, Rumänien, Spanien, Spitzbergen, Turkiet, USSR, Vatikanstaten och Jugoslavien.

7. Kreditiv

Om ingen av ovanstående metoder kan användas, är "oåterkalleligt kreditiv" vanligtvis den enda annan

metod vi kan acceptera. Detta kan också arrangeras genom en lokal bank. Kreditivet måste stå öppet i sex månader, det måste bekräftas av en London-bank, dellastning och omlastning måste medges och alla avgifter betalas. Med detta system erhåller vi inte betalning, förrän varorna har expedierats, men det tar mycket lång tid och på grund av dokumentkostnaderna kan vi inte godta detta system för beställningar som understiger £750.

Var vänlig och använd ingen annan betalningsmetod utan att först ha fått tillstånd av oss. I synnerhet kan vi inte godta penningförsändelser eller privata checker annat än enhetliga Eurochecker. I vilket fall som helst var vänlig och ange på beställningen vilken betalningsmetod som används.

TILAAMINEN ENGLANNIN ULKOPUOLELTA

Käytä mahdollisuuksien mukaan aina meidän omaa tilauslomakettamme. Halutessasi tilata jonkin nimikkeen kirjoitat pelkästään haluamasi lukumäärän sekä ko. nimikkeen viisimerkkisen koodin, joka on painettu lihavalla sanan "Order" viereen. Vastuksia tilattaessa on kirjoitettava haluttua tyyppiä vastaava koodikirjain sekä vastusarvo – lisätietoja on annettu erillisessä "Vastusosassa".

Kaikkiin tässä luettelossa annettuihin hintoihin (paitsi milloin hinnan vieressä on merkintä "NV") sisältyy Englannissa perittävä arvonlisävero (VAT), jota et kuitenkaan ole velvollinen maksamaan. Mutta jos toimitusosoite on muu kuin Englanti, Mansaari, Irlanti tai Kanaalisaaret, me veloitamme tosiasialliset postiutuskulut. Sinun on sen vuoksi lähetettävä riittävästi rahaa myös postimaksun kattamiseksi. Euroopan sekä muualle lähetettävään maapostin osalta suositamme luettelohinnan käyttöä, sillä useimmissa tapauksissa hintaan sisältyvä arvonlisävero kattaa postimaksun. Kovin pienten tilausten kohdalla se ei kuitenkaan riitä; jos siis tilauksesi kokonaisarvo on alle 15 punttaa, lisää 1 punta, ja jos se on alle 7 punttaa, lisää 2 punttaa. Tilattaessa merkinnällä "NV" varustettuja nimikkeitä on syytä lisätä hintaan 25%, sillä ne ovat useimmiten kirjoja ja siten melko painavia. Ja jos tilaukseen sisältyy todella raskaita nimikkeitä, kuten muuntajia tai suihketölkkejä, on syytä lisätä vielä ylimääräiset 3 punttaa.

Me hyvitämme aina saamamme liikamaksut. Voimme myös palauttaa rahan, jollet aio tilata myöhemmin lisää tavaraa, mutta tällöin joudumme vähentämään pankkikulut ja 1 punttaa pienemmät palautukset tulevat kannattamattomiksi.

Jos haluat tavarantoimitettavaksi lentopostissa, kirjoita tilauksesi poikki suurin kirjaimin teksti "AIRMAIL". Me toimitamme tilauksen lentopostissa kuitenkin vain siinä tapauksessa, että olet lähettänyt riittävästi rahaa postikuluja varten. Jos rahaa ei ole lähetetty tarpeeksi, me ehkä toimitamme tavarantoimitusta maapostissa – huolehdi siis siitä, että lähettämäsi summa on riittävä. Nyrkkiäänä voimme sanoa, että lentoposti on noin kaksi kertaa kalliimpi kuin maaposti. Lisää siis ylimääräiset 15% koko summaan tai kerro kahdella annettu maapostimaksu, jos se on oman tilauksesi osalta tiedossa.

On olemassa kaikkiaan seitsemän eri tapaa, joilla voit toimittaa meille tilaustasi kiskevän maksusuorituksen. Kaikissa tapauksissa šekkeihin ynnä muihin on maksun saajaksi merkittävä Maplin Electronic Supplies Ltd.

1. Yksimuotoiset Euroškit

Jos sinulla on Eurošekki vihko, voit yksinkertaisesti kirjoittaa summan puntamääräisenä ja

allekirjoittaa šekin. Halutessasi voit myös kirjoittaa šekin hiukan laskelmaasi suuremmalle summalle jättämällä summan kohdan tyhjäksi mutta kirjoittamalla poikittain šekin yli sanat "NOT MORE THAN £...." (= enintään punttaa...), jolloin me täytämme šekkiin tarkan summan ja vältytään kokonaan hyvityksiltä ja palautuksilta; maksat tarkalleen veloitettavan summan: lähetetyn tavarantoimituksen arvosta plus tosiasialliset postiutuskulut. Muista aina kirjoittaa šekin kääntöpuolelle Eurošekkien takauskorttisi numero.

2. Pankkiasete

Mene johonkin postitoimittajaan ja osta pankkilaite. Oritilaiselle pankille asetettu tratta tarkalleen oikealle summalle, puntamääräisenä. Me lähetämme tilaamasi tavarat heti kun saamme tilauksesi, sillä trattaan painettu brittiläinen pankki takaa maksusuorituksen.

3. Luottokortti

Jos sinulla on Eurocard/Mastercard/Access, Visa/Carte Bleue tai American Express luottokortti, voit kirjoittaa pelkästään korttisi numeron tilaukseen, mainiten samalla mistä kortista on kysymys ja mihin asti se on voimassa, ja allekirjoittaa tilauksen. Älä lähetä korttiasi tilauksen mukana. Me toimitamme tilauksesi välittömästi ja sinua veloitetaan vain juuri tilauksesi mukaisella summalla.

4. Postiosoitukset ja Kansainväliset Vastauskupongit

Me hyväksymme postiosoitukset edellyttäen että ne ovat puntamääräisiä ja peräisin jostakin sivulla 20 olevassa, otsikolla "Postal Orders" varustetussa luettelossa mainitusta maasta. Samassa kohdassa on annettu myös lisätietoja. Hyvin pienten tilausten, kuten luetteloiden ja lehtien osalta me hyväksymme myös kansainväliset vastauskupongit (IRC). Kunkin IRC-kupongin arvo on 22p.

5. Ulkomaan Valuutat

Me hyväksymme ulkomaan valuuttaa (ei kolikoita) vain jos se lähetetään kirjattuna ja lähettäjän omalla vastuulla.

6. Postiennakko

Me voimme lähettää tavaraa postiennakolla useimpiin Euroopan maihin. Sinulta veloitetaan toimitettavat tavarat, tosiasialliset postikulut sekä postiennakkomaksu. Tällä hetkellä postienakkomaksu on 2,40 punttaa 200 punnalta. Sinun on kirjoitettava suurin kirjaimin

poikittain tilauksesi yli kirjaimet 'C.O.D.'. Me emme toimita tavaraa postiennakolla seuraaviin Euroopan maihin: Albania, Andorra, Balearit, Bulgaria, Espanja, Grönlandi, Huippuuoaret, Jugoslavia, Kanarian saaret, Kap Verde, Kreikka, Neuvostoliitto, Puola, Romania, Saksan demokraattinen tasavalta, Turkki ja Vatikaanivaltio.

7. Remburssi

Jos et pysty käyttämään mitään yllä mainituista maksutavoista, silloin on yleensä käytettävissä ainoastaan "peruuttamaton luottokirje", joka myös voidaan järjestää minkä tahansa pankin välityksellä. Luoton on oltava auki kuusi kuukautta ja jonkin lontoolaisen pankin vahvistama; osatoimitusten ja kauttakuljetusten on oltava luvallisia, ja sinun on maksettava kaikki kulut. Tällä järjestelyllä me saamme maksun vasta, kun tavarat on lähetetty, mutta menetelmä on kovin hidas ja suuren asiapaperimäärän vuoksi me hyväksymme sen käytön vain, jos tilaus on arvoltaan vähintään 750 punttaa.

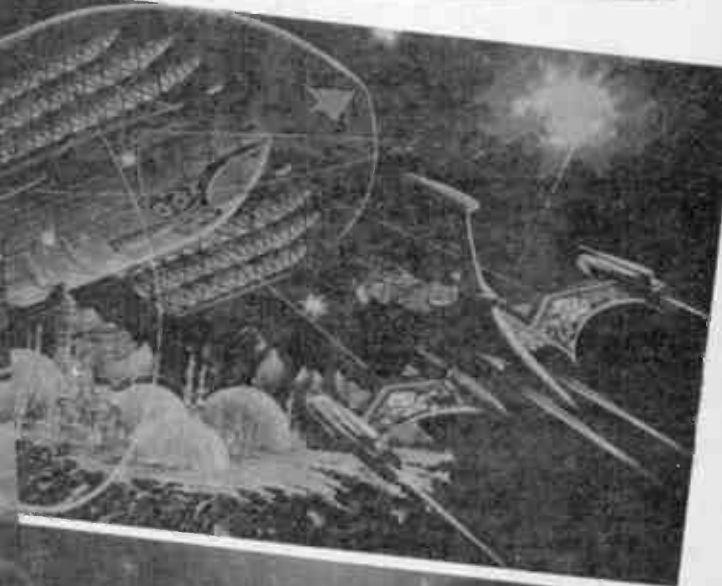
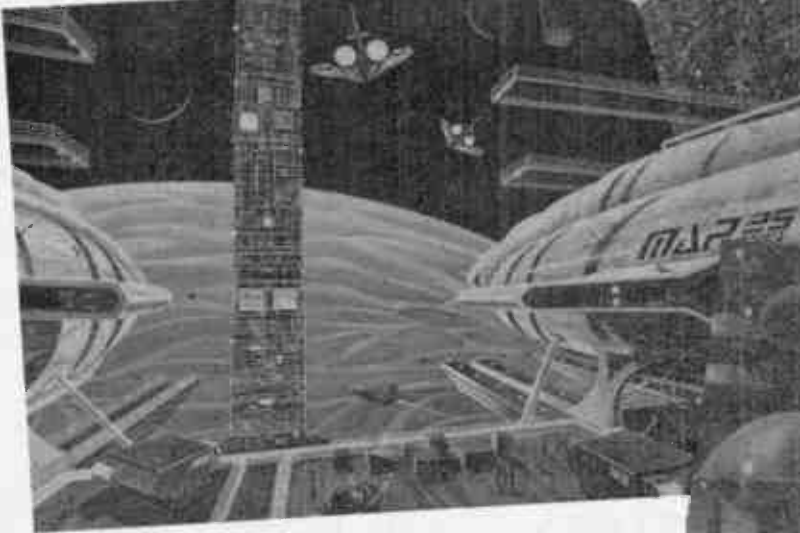
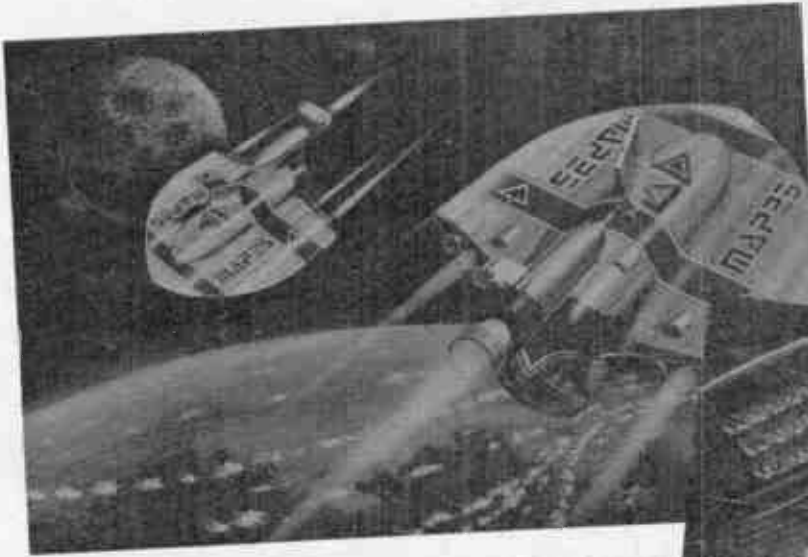
Älä käytä mitään muuta maksutapaa ennen kuin olet saanut meidän suostumuksemme. Me emme hyväksy varsinkaan maksusoituksia emmekä henkilökohtaisia šekkejä yksimuotoisia Eurošekkejä lukuun ottamatta. Mainitse aina tilauksessasi mitä maksutapaa käytät.

CALENDAR FOR 2387 (and 1987)

The six superb pictures which appeared on the covers of the Maplin catalogue over 400 years ago, reproduced in full colour on glossy art paper in the form of a calendar with two months to each picture. The overall size of the calendar is approx. 35cm square. This is a magnificent replica of a calendar that was first printed for the year 1987 when the dates in the year fell on the same days as they do next year (2387). At that time, the calendar was available for sale from the 1st October 1986 and was sold for what now seems the unbelievably low price of just £3.50! Reserve your copy now.

Order

XH63T (Calendar For 2387)..... £3.50NV



AERIALS

Aerial Accessories	32	Car Aerials	36	Telescopic Aerials	36
Aerial Amplifiers	33	Rotators	33	UHF & VHF Aerials	30

CHOOSING AN AERIAL

If you want to get the best out of your FM receiver or TV set invest in a good aerial. So many people spend hundreds of pounds on a TV set or FM receiver and then never allow it to work as well as it could, because they won't spend a few more pounds on a good aerial.

If at all possible always fit an aerial outside and as high as possible and for best results it should have a clear view to the horizon. Aerials in the loft can be satisfactory but they will need to be carefully positioned as they are affected by water tanks and pipes and cables. Remember the signal level inside a roof can be as little as one tenth of the level outside, so you will need a bigger aerial to achieve the same result that an outside aerial would give. Set-top aerials are rarely completely satisfactory as they are affected by people moving in the room, cars passing by, trees moving outside and other effects of this kind. In flats, indoor aerials only work if your outside wall is on the side of the block nearest the transmitter.

The farther you live from the transmitter the bigger the aerial you will need. For colour on UHF TV or stereo on VHF radio you will need a bigger aerial than for mono, and for a teletext receiver you will need an even better aerial.

For TV it is very important to ensure that you choose the right group aerial for your local transmitter. There are six groups generally in use in Europe and they are:

Group A	: Channels 21-34	Group K	: Channels 21-48
Group B	: Channels 39-53	Group E	: Channels 39-68
Group C/D	: Channels 48-68	Group W	: Channels 21-68

Our table of transmitting stations shows which group aerial will be needed to receive the station you require. If you choose a wideband aerial in order to receive from several different transmitters it will need to be larger than its equivalent single group aerial to give the same gain over the whole band.

The aerial should point directly towards the transmitter with the cross-pieces (elements) at right angles to the transmitter. If the polarisation is horizontal (H), or mixed (M) mount the aerial so that the elements are horizontal whilst if the polarisation is vertical (V), the elements of the aerial should be vertical.

All VHF radio stations are gradually being converted to mixed polarisation (i.e. the transmitter power is divided equally between a horizontal component and a vertical component) in order to improve reception in cars and on portable sets.

If there is a major obstruction, hill, large building, gasometer etc. directly in line with the transmitter it can sometimes improve reception if the aerial is pointed slightly to one side of the direction of the transmitter. Raising the height of the aerial can also improve reception. Often raising an aerial by as little as one metre can be equivalent to doubling the size of

the aerial. With VHF radio aerials the smallest element should be closest to the transmitter and mounted at least 600mm (2ft) from the nearest TV aerial. If you get a hiss on stereo, but not on mono you need a bigger aerial. If you get a whispering hiss or 'birdie' on mono and stereo (especially on Radio 3) the signal level is too high and it will be necessary to fit an attenuator in the lead. If you get this kind of hiss in stereo only use a bigger aerial to make it more directional. (In general the bigger the aerial the more selective it will be in picking up signals only from the front and not from the sides or rear). If high pitched sounds are distorted turn the aerial for least distortion rather than maximum signal strength and use a more directional aerial. (In this respect use of a cranked mast can help as this gives some lateral as well as rotational adjustment which can be a help). If crackles from passing vehicles are a problem mount the aerial such that the roof shields it from the road. To reduce the effects of passing aircraft causing volume changes use two aerials stacked one above the other.

In addition to the above, for TV reception graininess in a colour picture or snow in a mono picture points the need for a larger aerial. Adjust the aerial position to eliminate 'ghosts' on the picture or use a bigger more directional aerial. It may be impossible to completely eliminate ghosting and this will be a problem if you are hoping to receive teletext.

As a last resort aerial amplifiers can help, but they will only do so if the problem is a weak signal only. If there is, or also is, ghosting or other interference the results with the amplifier will be worse or at best the same as without the amplifier.

It is good practice to earth the screen of the down-lead where it enters the building, but this will have no effect on the signal received and is only there as a protection against electrical faults and to give some protection to the set in the unlikely event that the aerial is struck by lightning. In any event never touch the aerial lead during a thunderstorm.

Use a good map to assess the proper direction for the aerial to point and remember that the TV and radio aerials may well have to point in different directions. If in doubt the BBC and IBA can provide Service Area Maps for any transmitter if you send them a large stamped, addressed envelope. In particular, the BBC has available UHF TV transmitter details which caravanners may find particularly useful, and they can offer technical advice to the public or trade on reception problems either from the address below or by telephoning (office hours) 01-927 5040. The address to write to is:

for BBC stations:
Engineering Information
Department (Ref. M),
BBC,
Broadcasting House,
London W1A 1AA

or for ITV and ILR stations:
Engineering Information Service,
Independent Broadcasting Authority,
Crawley Court,
Winchester,
Hants. SO21 2QA

UHF TELEVISION STATIONS

The following is a list of UHF 625-line TV stations expected to be operating by the Summer of 1986. Many Channel 4 frequencies shown are not yet operating but all are expected to be in service before the end of 1987.

Station	Channels				Power (ERP) (kW)	Group	Polarisation
	B	B	I	C			
	B	B	I	C			
	B	B	T	H			
	C	C	V	4			
	1	2					
BBC1: LONDON @ ITV: THAMES/LONDON WEEKEND							
Crystal Palace	26	33	23	30	1000	A	H
Alexandra Palace	58	64	61	54	0.07	C/D	H
Biggin Hill	45	52	49	67	0.008	E	V
Bishop's Stortford	55	62	59	49	0.03	C/D	V
Cane Hill	61	54	58	68	0.03	C/D	V
Caterham	55	62	59	65	0.0075	C/D	V
Chepping Wycombe	51	44	41	47	0.02	B	V
Chesham	40	46	43	50	0.1	B	V
Chingford	56	50	52	48	0.0075	C/D	V
Croydon (Old Town)	49	56	52	67	0.033	C/D	V
East Grinstead	40	56	46	59	0.117	E	V
Forest Row	48	54	62	66	0.12	C/D	V
Gravesend	55	62	59	49	0.012	C/D	V
Great Missenden	58	64	61	54	0.085	C/D	V
Guildford	40	46	43	50	10	B	V
Hemel Hempstead	51	44	41	47	10	B	V
Hemel Hempstead Town	58	64	61	54	0.013	C/D	V
Henley-on-Thames	48	64	67	54	0.1	C/D	V
Hertford	58	64	61	54	2	C/D	V
High Wycombe	55	62	59	65	0.5	C/D	V
Hughenden	40	46	43	50	0.06	B	V
Kenley	40	46	43	50	0.175	B	V
Lea Bridge	55	62	59	59	0.006	E	V
Marlow Bottom	58	64	61	54	0.011	C/D	V
Micklefield	54	64	57	67	0.008	C/D	V
Mickleham	61	55	58	68	0.1	C/D	V
New Addington	64	48	54	68	0.018	C/D	V
Orford	57	63	60	53	0.031	C/D	V
Reigate	57	63	60	53	10	C/D	V
St Albans	49	63	57	67	0.022	C/D	V
Skirmett	51	44	41	47	0.126	B	V
Walthamstow North	45	46	49	68	0.002	E	V
Welwyn	40	46	43	50	0.15	B	V
West Wycombe	40	46	43	67	0.035	E	V
Wondersh	48	65	52	67	0.012	C/D	V

Station	Channels				Power (ERP) (kW)	Group	Polarisation
	B	B	I	C			
	B	B	I <td>C</td> <td></td> <td></td> <td></td>	C			
	B	B	T	H			
	C	C	V	4			
	1	2					
Woolburn	49	52	56	68	0.1	C/D	V
Woolwich	57	63	60	67	0.63	C/D	V
BBC1: LONDON @ ITV: TVS SOUTH-EAST							
St Marks (Tunbridge Wells)	57	63	60	53	0.051	C/D	V
Tunbridge Wells	51	44	41	47	10	B	V
Bluebell Hill	40	46	43	66	30	E	H
Chatham Town	58	68	61	54	0.014	C/D	V
BBC1: SOUTH-EAST @ ITV: TVS SOUTH-EAST							
Dover	50	56	66	53	100	C/D	H
Chartham	21	27	24	31	0.1	A	V
Dover Town	33	26	23	30	0.1	A	V
Faversham	22	28	25	32	0.013	A	V
Horn Street	58	44	41	47	0.0035	E	V
Hythe	21	27	24	31	0.05	A	V
Newnham	21	27	24	31	0.035	A	V
Rye	58	44	41	47	0.015	E	V
Heathfield	49	52	64	67	100	C/D	H
Eastbourne	33	26	23	30	0.094	A	V
Hamatree	33	26	23	30	0.001	A	V
Hastings	22	25	28	32	1	A	V
Haywards Heath	39	45	43	41	0.037	B	V
Lamberhurst	54	60	52	68	0.004	C/D	V
Newhaven	39	45	43	41	2	B	V
Sedlescombe	33	26	23	30	0.009	A	V
Wye (Ashford)	22	28	25	32	0.031	A	V
BBC1: SOUTH @ ITV: TVS SOUTH							
Hennington	39	45	42	66	250	E	H
Aldboune	21	27	24	31	0.009	A	V
Alton	49	62	59	52	0.01	C/D	V
Christy	55	62	59	52	0.025	C/D	V
Hardean	49	52	56	59	0.022	C/D	V
Lambourn	55	62	59	52	0.007	C/D	V
Sutton Row	22	28	25	32	0.25	A	V
Tidworth	22	28	25	32	0.01	A	V
Midhurst	61	55	58	68	100	C/D	H
Hasternere	22	28	25	32	0.015	A	V
Rowridge	31	24	27	21	500	A	H
Brightstone	51	44	41	47	0.144	B	V
Brighton	57	63	60	53	10	C/D	V
Cheselbourne	57	63	60	53	0.007	C/D	V
Corfe Castle	51	44	41	47	0.016	B	V
Donhead	51	44	41	47	0.028	B	V
Findon	51	44	41	47	0.05	B	V
Hangleton	39	45	49	42	0.007	B	V
Lulworth	55	62	59	65	0.011	C/D	V
Millbrook	51	44	41	47	0.035	B	V
Ovingdean	85	42	44	68	0.02	E	V
Patcham	46	40	43	50	0.07	B	H
Piddletrenthide	39	45	49	42	0.056	B	V
Poole	57	63	60	53	0.1	C/D	V
Portslade	51	44	41	47	0.02	B	V
Salisbury	57	63	60	53	10	C/D	V
Saltdean	51	66	55	47	0.02	E	V
Shrewton	51	44	41	47	0.0045	B	V
Till Valley	46	40	43	50	0.075	B	V
Ventnor	39	45	49	42	2	B	V
Westbourne	51	44	41	47	0.04	B	V
Winterbourne Steepleton	40	46	43	50	1	B	V
Winterbourne Steepleton	39	49	45	68	0.012	E	V
BBC1: LONDON @ ITV: CENTRAL WEST MIDLANDS							
Oxford	57	63	60	53	500	C/D	H
Ascot under Wychwood	21	27	24	31	0.029	A	V
Charbury	51	44	41	47	0.013	B	V
BBC1: MIDLANDS @ ITV: CENTRAL WEST MIDLANDS							
The Wrekin	26	33	23	100	A	H	
Ciun	55	62	59	65	0.056	C/D	V
Coalbrookdale	51	44	41	47	0.0035	B	V
Halesowen	58	64	61	54	0.013	C/D	V
Ridge Hill	22	28	25	32	100	A	H
Andoverford	55	62	59	65	0.058	C/D	V
Eardiston	58	64	61	54	0.0065	C/D	V
Garth Hill	57	63	60	53	0.025	C/D	V
Hazler Hill	51	44	41	47	0.025	B	V
Hope-under-Dinmore	57	63	60	53	0.0018	C/D	V
Kington	39	45	49	42	0.025	B	V
Ludlow	39	45	42	49	0.025	B	V
New Radnor	51	44	41	47	0.125	B	V
Oakley Mynd	39	45	49	42	0.05	B	V
Peterchurch	57	63	60	53	0.076	C/D	V
St Briavels	40	46	43	50	0.012	B	V
Upper Soudley	40	46	43	50	0.002	B	V
Sutton Coldfield	46	40	43	50	1000	B	H
Allesley Park	22	28	25	32	0.033	A	V
Bretch Hill	65	48	55	67	0.087	C/D	V
Brierley Hill	57	63	60	53	10	C/D	V
Bromsgrove	31	27	24	21	2	A	V
Cheadle	48	66	56	68	0.024	C/D	V

Table with columns: Station, Channels (B, B1, C, B1, C, C, C, V, 4), Power (ERP, kW), Group, Polarisation, Station, Channels (B, B1, S, B, B1, T, C, C, C, V, 4), Power (ERP, kW), Group, Polarisation, Station, Channels (B, B1, C, B, B1, T, H, C, C, V, 4), Power (ERP, kW), Group, Polarisation.

BBC1: MIDLANDS ● ITV: CENTRAL EAST MIDLANDS

Table listing stations for BBC1 Midlands and ITV Central East Midlands, including Ambergate, Ashbourne, Walfham, Ashford-in-the-Water, Belper, Bolehill, Eastwood, Matlock, Nottingham, Parwich, Stamford, Stanton Moor.

BBC1: SOUTH WEST ● ITV: SOUTH WEST

Table listing stations for BBC1 South West and ITV South West, including Bracon Hill, Ashburton, Buckfastleigh, Coombe, Dartmouth, Newton Abbot, Occombe Valley, Sidmouth, Tegenmouth, Totnes, Caradon Hill, Aveton Gifford, Chambercombe, Combe Martin, Croyde, Gunnislake, Hartland, Ilfracombe, Ivybridge, Kingsbridge, Loos, Lostwithiel, Mawganissey, Newton Ferrers, Okhampton, Penatigon Downs, Penryn, Plymouth (North Road), Plympton, Polperro, St. Austell, Salcombe, Slapton, Tavistock, Truro, Woolacombe, Huntslow Cross, Brushford, Chagford, North Bovey, Swimbridge, Westward Ho!, Redruth, Boscastle, Bossiney, Downderry, Guival, Heiston, Isles of Scilly, Porthleven, Portreath, Praa Sands, St. Anthony-in-Roseland, St. Just, Stockland Hill, Bampton, Baamister, Beer, Bidport, Clifm Valley, Dswigh, Dunsford, St Thomas (Exeter), Siokeinteignhead, Tiverton, Weymouth.

BBC1: WALES ● ITV: HTV (WALES)

Table listing stations for BBC1 Wales and ITV HTV (Wales), including Blaenplwyf, Aberystwyth, Alon Dyfi, Bow Street, Carno, Corris, Dolobont, Fishguard, Kerry, Lienbrynmair, Llendinam, Lienfyllin, Liengadfan, Liengurig, Liengynog, Llanidloes, Llanrhaeadr-ym-Mochnant, Long Mountain, Machynlleth, Moel-y-Sant, Trefilan, Tregynon, Ynys-Pennal, Carmar, Abercraf, Bu-ith Wells, Cwmgors, Greenhill, Llandindod Wells, Llanelli, Liensawel, Llansawrdy Wells, Mynydd Emroch, Penderyn, Rhayader.

BBC1: WALES ● ITV: HTV (WEST)

Table listing stations for BBC1 Wales and ITV HTV (West), including Chepstow.

BBC1: WEST ● ITV: HTV (WEST)

Table listing stations for BBC1 West and ITV HTV (West), including Mendip, Avening, Backwell, Bath, Blakeney, Bristol Barton House, Bristol Ilchester Crescent, Bristol Kings Weston Hill, Bristol Montpellier, Bruton, Burrington, Calne, Cerne Abbas, Chalford.

BBC1: EAST ● ITV: ANGLIA

Table listing stations for BBC1 East and ITV Anglia, including Sandy Heath, Dallington Park, King's Lynn, Luton, Sudbury, Felixstowe, Ipswich (Stoke), Wivenhoe Park, Woodbridge, Tacolneston, Aidedburgh, Burnham, Bury St Edmunds, Creake, Linnet Valley, Little Walsingham, Norwich (Central), Thetford, Wells-next-the-Sea, West Runton.

BBC1: NORTH ● ITV: YORKSHIRE

Table listing stations for BBC1 North and ITV Yorkshire, including Belmont, Weaverthorpe, Emley Moor, Aaddingham, Armthage Bridge, Bescot Hill, Calver Peak, Chesterfield, Cop Hill, Copley, Crago Vale, Droxford, Grassington, Hagg Wood, Halifax, Hasland, Haslingden, Heyshaw, Holmfild, Holmfirth, Hope, Hunmanby, Idie, Keighley, Keighley Town, Kettlewell, Luddenden, Oliver's Mount, Oughtibridge, Oxenhope, Primrose Hill, Ripponden, Skipton Edge, Skipton, Skipton Town, Stocksbridge, Sutton in Craven, Tideswell Moor, Trolley Rise, Wharfedale, Wincobank (Sheffield).

BBC1: NORTH-WEST ● ITV: YORKSHIRE

Table listing stations for BBC1 North-West and ITV Yorkshire, including Cornholme, Todmorden, Walsden, Walsden South.

BBC1: NORTH-WEST ● ITV: GRANADA

Table listing stations for BBC1 North-West and ITV Granada, including Winter Hill, Austwick, Backbarrow, Bacup, Bidston, Birch Vale, Blackburn, Bollington, Brook Bottom, Buxton, Carlisle, Chatburn, Chinley, Congleton, Dalton, Darwen, Delph, Dog Hill, Elton, Glossop, Haslingden, Ladder Hill, Lancaster, Lengley, Littleborough, Macclesfield, Melling, Middleton, Milom Park, North Oldham, Oakenhead, Over Biddulph, Parbois, Pendle Forest, Penny Bridge.

Station	Channels				Power (ERP) (kW)	Group	Polarisation	Station	Channels				Power (ERP) (kW)	Group	Polarisation	Station	Channels				Power (ERP) (kW)	Group	Polarisation
	B	B	I	C					B	B	I	C					B	B	I	C				B	B	I	C
Ramsbottom	48	66	56	68	0.08	C/D	V	Innerleithen	58	64	61	54	0.1	C/D	V	Brechin	40	48	43	50	0.008	B	V
Ribblesdale	51	44	41	47	0.03	B	V	Jacoburg	51	44	41	47	0.16	B	V	Elton	39	45	49	42	0.0027	B	V
Romley	51	44	41	47	0.011	B	V	Lauder	22	28	25	32	0.0112	A	V	Gartly Moor	58	64	61	54	2.2	C/D	V
Saddleshire	52	45	49	42	2	B	V	Peebles	22	28	25	32	0.1	A	V	Peterhead	55	62	59	65	0.1	C/D	V
Staveley-in-Cartmel	40	46	43	53	0.01	B	V	Stow	33	26	23	29	0.0056	A	V	Rosehearty	51	44	41	47	2	B	V
Storaton	22	28	25	32	2.8	A	V	Yetholm	51	44	41	47	0.0065	B	V	Tomintoul	40	46	43	50	0.0065	B	V
Trawden	57	63	60	67	0.2	C/D	V	BBC1: SCOTLAND						Tullich	55	62	59	65	0.07	C/D	V		
Ulswick	51	44	41	47	0.008	B	V	Sandale	22	-	-	-	500	A	H	Eitshal	33	26	23	29	100	A	H
West Kirby	34	27	24	31	0.013	A	V	BBC1: SCOTLAND ● ITV: SCOTTISH						Arindoul	39	45	49	42	0.06	B	V		
Whalley	40	46	43	53	0.05	B	V	Black Hill	40	46	43	50	500	B	H	Attedale	22	28	25	32	0.01	A	V
Whitwell	57	63	60	67	0.08	C/D	V	Abington	57	63	60	53	0.0051	C/D	H	Badachro	40	46	43	50	0.035	B	V
Whitworth	22	28	25	32	0.05	A	V	Ballichulsh	33	26	23	29	0.018	A	V	Bruernish	40	46	43	50	0.007	B	V
Woodnock	39	45	49	52	0.003	B	V	Bellanoch	39	45	42	49	0.06	B	V	Clatraval	51	44	41	47	2	B	V
BBC1: NORTH-WEST ● ITV: BORDER								BBC1: SCOTLAND ● ITV: SCOTTISH								BBC1: NORTHERN IRELAND ● ITV: ULSTER							
Coniston High Man	21	27	24	31	0.09	A	V	Biggar	22	28	25	32	0.5	A	V	Kilbride (S. Uist)	39	45	49	42	0.13	B	V
Crosthwaite	57	63	60	67	0.015	C/D	V	Broughton	21	27	24	31	0.007	A	V	Ness of Lewis	51	44	41	47	0.032	B	V
Grasmere	57	63	60	67	0.02	C/D	V	Callander	22	28	25	32	0.1	A	V	Penfith	39	45	49	42	0.04	B	V
Hawkshead	33	26	23	29	0.061	A	V	Castlebray	21	27	24	31	0.0066	A	V	Scoval	55	62	59	65	0.16	C/D	V
Kendal	58	64	61	54	0.5	C/D	V	Cathcart	57	63	60	53	0.0017	C/D	V	Sknraig	21	27	24	31	0.87	A	V
Sedburgh	40	46	43	50	0.5	B	V	Cow Hill	40	46	43	50	0.065	B	V	Tarbert (Harris)	39	45	49	52	0.05	B	V
Windermere	51	44	41	47	0.5	B	V	Dalmally	51	44	41	47	0.05	B	V	Uig	53	46	43	50	0.004	B	V
Ise of Man								Dollar	58	64	61	54	0.01	C/D	V	Ullapool	39	45	49	52	0.078	B	V
Beary Park	40	46	43	50	0.25	B	V	Dycharmore	22	28	25	32	0.001	A	H	Keelylang Hill	40	46	43	50	100	B	H
Douglas	68	66	48	56	2	C/D	V	Frins	34	27	24	31	0.026	A	V	Baltsound	39	45	42	49	0.018	A	V
Port St Mary	58	64	61	54	0.25	C/D	V	Frinary	40	46	43	50	0.05	B	V	Bressay	22	28	25	32	10	A	V
Union Mills	39	45	42	49	0.0123	B	V	Gighe Island	51	44	41	47	0.06	B	V	Collafirth Hill	51	44	41	47	0.415	B	V
BBC1: NORTH-EAST ● ITV: BORDER								BBC1: NORTH-EAST ● ITV: BORDER								BBC1: NORTH-EAST ● ITV: BORDER							
Berwick-upon-Tweed	21	27	24	31	0.04	A	V	Glasgow (West Central)	68	62	56	66	0.032	C/D	V	Fetlar	40	46	43	50	0.13	B	V
Caldbeck	30	34	28	32	500	A	H	Glenngorm	56	52	48	54	1.1	C/D	V	Fitful Head	39	45	49	42	0.094	B	V
Arnstable	40	46	43	50	0.1	B	V	Glespin	58	64	61	54	0.007	C/D	V	Pierowall	33	26	23	29	0.007	A	V
Bassenthwaite	52	45	49	42	0.16	B	V	Haddington	55	62	59	65	0.5	C/D	V	Scalloway	55	62	59	65	0.029	C/D	V
Bleachgreen	57	63	60	67	0.006	C/D	V	Kilkeel	55	62	59	65	0.5	C/D	V	Swinster	55	62	59	65	0.16	C/D	V
Dentdale	57	63	60	67	0.052	C/D	V	Kilmacoin	21	27	24	31	0.032	A	V	Wesdale	58	64	61	54	0.06	C/D	V
Kirkfoth	58	64	61	54	0.05	C/D	V	Kinlochleven	55	62	59	65	0.011	C/D	V	Knock More	33	26	23	29	100	A	H
Halwhistle	55	62	59	65	2	C/D	V	Kirkfieldbank	57	63	60	53	0.0058	C/D	V	Balblair Wood	55	62	59	65	0.083	C/D	V
Kiswick	21	27	24	31	0.12	A	V	Mallaig	43	46	40	50	0.018	B	V	Craigielatche	57	63	60	53	0.07	C/D	V
Lorton	57	63	60	67	0.05	C/D	V	Narherton Brass	22	28	25	32	0.035	A	V	Grantoway	51	44	41	47	0.35	B	V
Lowther Valley	48	40	46	50	0.026	B	V	Dhan	51	44	41	47	0.012	B	V	Kingusie	40	46	43	50	0.091	B	V
South Knappdale	40	46	43	50	0.031	B	V	Onich	58	64	61	54	0.017	C/D	V	Lairg	51	44	41	47	0.013	B	V
Spean Bridge	48	40	46	50	0.013	B	V	Ravenscraig	21	27	24	31	0.02	A	V	Rosemarkie	39	45	49	42	100	B	H
Strachur	57	63	60	67	0.11	C/D	V	South Knappdale	57	63	60	53	1.45	C/D	V	Auchmore Wood	22	28	25	32	0.1	A	V
Strathblane	21	27	24	31	0.0064	A	V	Spean Bridge	21	27	24	31	0.07	A	V	Fodderty	57	63	60	53	0.12	C/D	V
Tarbert (Loch Fyne)	21	27	24	31	0.004	A	V	Strachur	22	28	25	32	0.035	A	V	Fort Augustus	33	26	23	29	0.011	A	V
Tillicoultry	57	63	60	67	0.0055	C/D	V	Strathblane	21	27	24	31	0.0064	A	V	Glen Urquhart	51	44	41	47	0.09	B	V
Torasy	22	28	25	32	20	A	V	Tarbert (Loch Fyne)	21	27	24	31	0.004	A	V	Inverness	56	62	59	65	0.035	C/D	V
Twechar	22	28	25	32	0.003	A	V	Tillicoultry	57	63	60	67	0.0055	C/D	V	Tomatin	22	28	25	32	0.012	A	V
Darvel	33	26	23	29	100	A	H	Torasy	22	28	25	32	20	A	V	Wester Erchite	21	27	24	31	0.016	A	V
Ardentenny	39	45	49	52	0.07	B	V	Twechar	22	28	25	32	0.003	A	V	Ben Tongue	39	45	49	42	0.04	B	V
Ardnamad	51	44	41	47	0.025	B	V	Darvel	33	26	23	29	100	A	H	Melivich	51	44	41	47	0.055	B	V
Arrochar	21	27	24	31	0.006	A	V	Ardentenny	39	45	49	52	0.07	B	V	Thurso	57	63	60	53	0.0027	C/D	V
Bowmore	39	45	49	52	0.08	B	V	Ardnamad	51	44	41	47	0.025	B	V	BBC1: NORTHERN IRELAND ● ITV: ULSTER							
Campbeltown	57	63	60	53	0.125	C/D	V	Arrochar	21	27	24	31	0.006	A	V	Brough Mountain	22	28	25	32	0.00	A	H
Carisdale	51	44	41	47	0.029	B	V	Bowmore	39	45	49	52	0.08	B	V	Beltone	51	44	47	66	0.008	E	V
Clonaig	55	62	59	65	0.074	C/D	V	Campbeltown	57	63	60	53	0.125	C/D	V	Berrigally	55	62	59	65	0.007	C/D	V
Dunure	40	46	43	50	0.0123	B	V	Carisdale	51	44	41	47	0.029	B	V	Divis	31	27	24	31	500	A	H
Garelochhead	51	44	41	47	0.015	B	V	Clonaig	55	62	59	65	0.074	C/D	V	Armagh	39	45	49	42	0.2	B	V
Grivan	55	62	59	65	0.25	C/D	V	Dunure	40	46	43	50	0.0123	B	V	Banbridge	44	46	43	50	0.006	B	V
Holmhead	51	44	41	47	0.012	B	V	Garelochhead	51	44	41	47	0.015	B	V	Bellair	46	56	52	67	0.04	C/D	V
Kirkcubbin	58	64	61	54	0.25	C/D	V	Grivan	55	62	59	65	0.25	C/D	V	Benagh	22	28	25	32	0.056	A	V
Kirkmichael	39	45	49	52	0.019	B	V	Holmhead	51	44	41	47	0.012	B	V	Black Mountain	39	45	49	42	0.025	B	V
Kirkoswald	22	28	25	32	0.032	A	V	Kirkcubbin	58	64	61	54	0.25	C/D	V	Carmoney Hill	40	46	43	50	0.02	B	V
Largs	39	45	42	49	0.0118	B	H	Kirkoswald	22	28	25	32	0.032	A	V	Cushendall	40	46	43	50	0.0175	B	V
Leithanhill	57	63	60	53	0.25	C/D	V	Lethanhill	57	63	60												

VHF RADIO STATIONS Continued

Frequency (MHz)	Station	Transmitter Site	Power max ERP	Polarisation	Frequency (MHz)	Station	Transmitter Site	Power max ERP	Polarisation	Frequency (MHz)	Station	Transmitter Site	Power max ERP	Polarisation
93.5	Radio Scotland/Tweed	Ashkirk	18kW	H	95.1	Radio Clyde	Black Hill, Glasgow	3.4kW	M	89.4	Radio 1/2	Kilkeel	25W	H
93.5	Radio Scotland/Highland	Kingussie	35W	H	95.8	Radio Tay	Tay Bridge	500W	M	89.6	Radio 1/2	Maddybenny More	200W	M
93.5	Radio Scotland/Highland	nán Eilean (M)	22kW	H	95.9	Moray Firth Radio	Mounteagle	1.4kW	M	90.1	Radio 1/2	Divis	60kW	H
93.6	Radio Scotland (M)	Melvaig	200W	H	96.2	West Sound	Darvel	800W	M	90.55	Radio 3	Londonderry	13kW	H
93.6	Radio Scotland	Pitlochry	25W	H	96.4	Radio Tay	Perth	250W	M	90.8	Radio 3 (M)	Rostrevor Forest	64W	M
93.7	Radio Scotland	Rosneath	1.1kW	H	96.8	Radio Forth	Craigkelly, Edinburgh	500W	M	91.0	Radio 3	Ballycastle	40W	H
93.7	Radio Scotland	South Knapdale	1.1kW	H	96.9	North Sound	Granite Hill	600W	M	91.3	Radio 3	Larne	10W	M
93.7	Radio Scotland/Highland (M)	Keelylang Hill	40kW	M	97.1	West Sound	Girvan	150W	M	91.6	Radio 3	Brougher Mountain	10kW	M
93.7	Radio Scotland/Highland (M)	Fort William	1.5kW	H	97.7	Radio Scotland (M)	Ba' schulish	15W	H	91.6	Radio 3	Kilkeel	25W	H
93.8	Radio Scotland Aberdeen	Durris	2kW	M	97.7	Radio Scotland (M)	Mallarg	20W	H	91.8	Radio 3	Maddybenny More	200W	M
93.8	Radio Scotland (M)	Port Ellen	65W	V	97.9	Radio Scotland (M)	Lochgilphead	10W	H	92.3	Radio 3	Divis	60kW	H
93.9	Radio Scotland-Solway	Stranraer	31W	V	98.2	Radio Scotland (M)	Strachur	20W	M	92.7	Radio Ulster/Foyle	Londonderry	13kW	H
93.9	Radio Scotland/Highland (M)	Glengorm	1.1kW	H	98.5	Radio Scotland (M)	Oban	5kW	M	93.0	Radio Ulster (M)	Rostrevor Forest	64W	M
93.9	Radio Scotland/Tweed	Innerleithen	20W	M	98.5	Radio Scotland (M)	Oban	5kW	M	93.2	Radio Ulster (M)	Ballycastle	40W	H
93.9	Radio Scotland/Highland	nán Eilean (M)	6W	H	98.7	Radio Scotland (M)	Melvaig	22kW	H	93.5	Radio Ulster	Larne	10W	M
94.0	Radio Scotland/Highland	Rosemarkie	12kW	H	98.9	Radio Scotland (M)	South Knapdale	1.1kW	H	93.8	Radio Ulster	Brougher Mountain	10kW	M
94.1	Radio Scotland/Highland (M)	Kintochleven	2W	H	98.9	Radio Scotland (M)	Fort William	1.5kW	H	93.8	Radio Ulster	Kilkeel	25W	H
94.3	Radio Scotland	Kirk o' Shotts	120kW	H	99.1	Radio Scotland (M)	Glengorm	1.1kW	H	94.0	Radio Ulster	Maddybenny More	200W	M
94.5	Radio Scotland/Highland	Rumster Forest	12.6kW	M	99.1	Radio Scotland (M)	Penfilier	6W	H	94.5	Radio Ulster	Divis	60kW	H
94.5	Radio Scotland/Aberdeen	Tullich	42W	M	99.3	Radio Scotland (M)	Kintochleven	2W	H	96.0	Downtown Radio	Black Mountain (Belfast)	1kW	M
94.6	Radio Scotland/Highland	Grantown Sandate	350W	H										
94.7	Radio 4		120kW	H										

Notes
 (M) : Not Stereo
 H : Horizontal
 V : Vertical
 M : Mixed (All stations are gradually being converted to mixed polarisation).
 † : No further information available at time of going to press.

VHF FM AERIALS

New type 108 Mushkillers, a range of high quality VHF/FM aerials introduced to cover the enlarged Band II frequency range of 88 to 108MHz. The aerials offer VSWR's as low as 1.05:1, have an even response to within 1/2dB over the band, display high directivity for stereo reception free from multipath distortion, and give up to 1 1/2dB extra gain with patented 'Trumatch' dipole.

3-Element

Suitable for good reception areas. It features the 'Trumatch' dipole, one director and one reflector. Supplied complete with Universal Clamp Type 1.

Forward Gain 4.5dB
 Front/Back Ratio 15dB
 Acceptance Angle ±32°
 Overall Size 864mm long x 1.73m wide

Order

XQ23A (Mushkiller FM1083) £13.60

5-Element

Suitable for outer reception areas. Supplied with Universal Clamp Type 1.

Forward Gain 6.5dB
 Front/Back Ratio 16dB
 Acceptance Angle ±28°
 Overall Size 2.05m x 1.73m wide

Order

XQ25C (Mushkiller FM1085) £20.95

7-Element

Suitable for distant and fringe reception areas. Supplied with Universal Clamp Type 1.

Forward Gain 8dB
 Front/Back Ratio 16.5dB
 Acceptance Angle ±25.5°
 Overall Size 3m long x 1.73m wide

Order

XQ27E (Mushkiller FM1087) £27.70

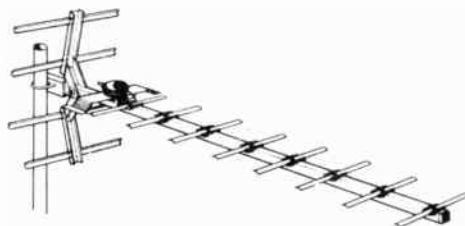
Delivery by Carrier. By mail-order please add carriage charge £5.50.

UHF TV AERIALS

Trucolour

A range of high quality aerials for use with Band IV and V UHF monochrome and colour TV sets. Each type is available in three channel or four channel groups.

10-Element



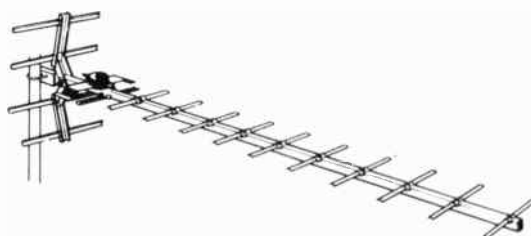
Suitable for use in the primary service area and supplied with a clamp to fix it to the mast.

	Group A	Group B	Group C/D	Group E
Forward Gain (±0.5dB)	11.7dB	11.7dB	11.5dB	11.0dB
Front/Back Ratio (±2dB)	28.3dB	28.3dB	29.2dB	24dB
Acceptance Angle (±3°)	±21°	±21°	±23°	±20°
Overall Size	1.1m	0.9m	0.82m	0.82m

Order

XQ29G (Trucolour TC10 Grp A) £10.60
 XQ30H (Trucolour TC10 Grp B) £10.60
 XQ31J (Trucolour TC10 Grp C/D) £10.60
 XG23A (Trucolour TC10 Grp E) £10.60

13-Element



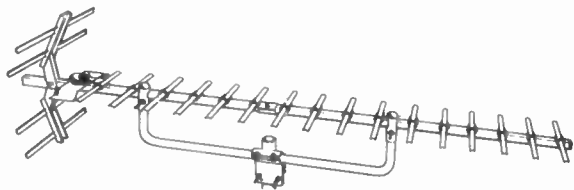
Suitable for medium range reception and supplied with a clamp to fix it to the mast.

	Group A	Group B	Group C/D
Forward Gain (±0.5dB)	13.0dB	13.0dB	13.4dB
Front/Back Ratio (±2dB)	27.2dB	27.2dB	28.2dB
Acceptance Angle (±3°)	±19°	±19°	±21°
Overall Size	1.4m	1.18m	1.07m

Order

XQ32K (Trucolour TC13 Grp A) £12.65
 XQ33L (Trucolour TC13 Grp B) £12.65
 XQ34M (Trucolour TC13 Grp C/D) £12.65

18-Element



Suitable for medium to long range reception and supplied with a Universal Clamp Type 1 and U support arm.

	Group A	Group B	Group C/D	Group E
Forward Gain (± 0.5 dB)	14.7dB	14.7dB	14.5dB	13.5dB
Front/Back Ratio (± 2 dB)	30.7dB	30.7dB	29.7dB	27.0dB
Acceptance Angle ($\pm 3^\circ$)	$\pm 16^\circ$	$\pm 16^\circ$	$\pm 17^\circ$	$\pm 15^\circ$
Overall Size	1.82m	1.54m	1.41m	1.4m

Order

XQ35Q (Trucolour TC18 Grp A)	£14.95
XQ36P (Trucolour TC18 Grp B)	£14.95
XQ37S (Trucolour TC18 Grp C/D)	£14.95
XG24B (Trucolour TC18 Grp E)	£14.95

Extragain

A range of high quality, high gain aerials for use with Bard IV and V UHF monochrome and colour TV sets. Especially suitable for use with teletext receivers. They are ideal for problem areas, ghosting and long-range reception. Features are the high forward gain Quad-X dipole and director chain; the high front to back ratio and improved directivity resulting from a massive six element full-wave reflector and the extra accurate matching given by a specially designed integral balun and resonator.

5-Bay Director Aerial



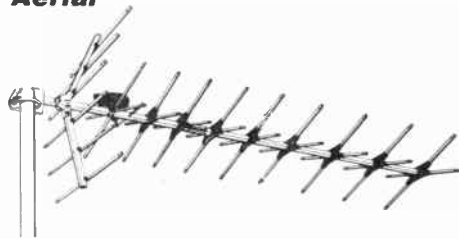
Suitable for local areas, this aerial has five powerful Quad-X director bays giving equivalent gain to that provided by a standard 18-element aerial. Available only as a wideband (W) giving coverage of all UHF channels. A very compact and economical aerial supplied complete with clamp.

Forward Gain	11dB
Front/Back Ratio	17-27dB
Acceptance Angle	$\pm 17-28^\circ$
Overall Size	0.76m long approx.

Order

XQ38R (Extragain XG5)	£19.95
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8-Bay Director Aerial



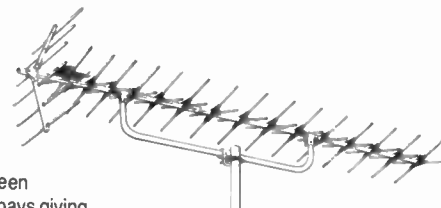
Suitable for fringe areas, this aerial has eight powerful Quad-X director bays giving equivalent gain to that provided by 2 standard 18-element aerials. Supplied with a three-way clamp for tail mounting, the aerial is available in three channel groups and a wideband version is also available.

	Group A	Group B	Group C/D	Wideband
Forward Gain (dB)	16	16	17	13
Front/Back Ratio (dB)	26-32	29-31	29-31	26-29
Acceptance Angle ($^\circ$)	$\pm 15-17$	$\pm 15-16$	$\pm 14-16$	$\pm 15-27$
Overall Size	1.36m long approx.			

Order

XQ39N (Extragain XG8 Group A)	£25.95
XQ40T (Extragain XG8 Group B)	£25.95
XQ41U (Extragain XG8 Grp C/D)	£25.95
XQ42V (Extragain XG8 Wdbnd)	£25.95

14-Bay Director Aerial



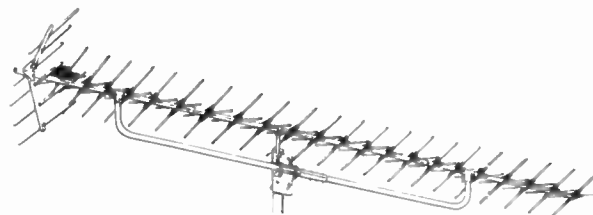
Suitable for outer fringe areas, this aerial has fourteen powerful Quad-X director bays giving equivalent gain to that provided by four standard 18-element aerials. Supplied with a U support arm and three-way clamp, the aerial is available in three channel groups and a wideband version is also available.

	Group A	Group B	Group C/D	Wideband
Forward Gain (dB)	18.5	18	19	15
Front/Back Ratio (dB)	27-31	30-35	30-34	27-31
Acceptance Angle ($^\circ$)	$\pm 13-15$	$\pm 14-15$	$\pm 13-16$	$\pm 13-23$
Overall size	2.11m long approx			

Order

XQ43W (Extragain XG14 Group A)	£49.95
XQ44X (Extragain XG14 Group B)	£49.95
XQ45Y (Extragain XG14 Grp C/D)	£49.95
XQ46A (Extragain XG14 Wdbnd)	£49.95

21-Bay Director Aerial



Suitable for extreme fringe areas, this extremely powerful aerial is the ultimate in UHF reception. The aerial has 21 powerful Quad-X director bays giving gains of up to 19dB. Supplied with a U support arm and special double clamp, the aerial is available only in a wideband version.

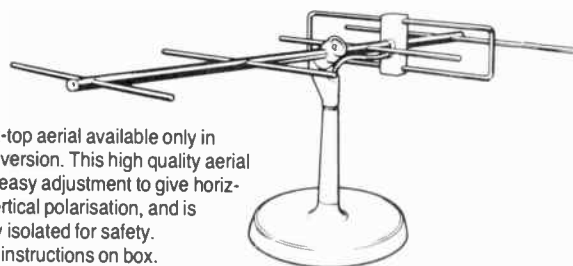
Forward Gain (dB)	17
Front/Back Ratio (dB)	30-31
Acceptance Angle ($^\circ$)	$\pm 10-24$
Overall Size	3.38m long approx.

(It is recommended that this aerial be mounted on a 51mm (2in.) mast with a lashing kit No.7)

Order

XQ50E (Extragain XG21 Wdbnd)	£69.95
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High Performance Indoor Set-Top Aerial

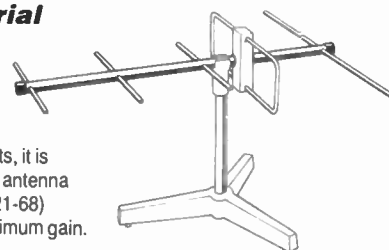


A UHF set-top aerial available only in wideband version. This high quality aerial allows for easy adjustment to give horizontal or vertical polarisation, and is electrically isolated for safety. Assembly instructions on box.

Order

XQ51F (Super-Set Top)	£8.95
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Indoor Set-Top Aerial



The "Toptenna" is a new set-top aerial that out-performs all the competition at this price. Styled to match modern portable TV sets, it is a precisely tuned yagi wideband antenna covering all the UHF channels (21-68) with minimum ghosting and maximum gain.

Order

XY30H (Toptenna)	£4.50
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Leisure Aerial



A specially designed aerial for caravanning, camping, boating etc. suitable for reception of all UHF TV stations at home and abroad. The aerial can be fitted in seconds and the pack comprises a 7-element wideband aerial adjustable for horizontal or vertical polarisation with gold anodised elements and weather-proof cable junction unit and a unique mounting bracket that gives a choice of permanent or 'no hole' fixing. Full instructions and UK stations guide are provided on the box.

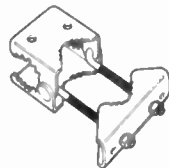
Order

XQ52G (Caratenna CA7) £9.90

MOUNTING BRACKETS AND MASTS

Bracket No. 1

A universal clamp for masts up to 51mm (2in.) diameter.

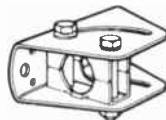


Order

BW42V (Univ. Clamp Type 1) £1.55

Bracket No. 2

A surface mounting bracket for masts up to 25.4mm (1in.) diameter.



Order

BW43W (Mast Bracket Type 2) £2.25

Bracket No. 3

A wall-mounting bracket for 25.4 to 32mm diameter mast (1 to 1¼in.) and providing a 102mm (4in.) stand-off.



Order

XQ53H (Mast Bracket Type 3) £7.45

Bracket No. 8

A heavy duty double wall-mounting bracket for masts up to 51mm (2in.) diameter and providing a 203mm (8in.) stand-off.



Order

XQ54J (Mast Bracket Type 8) £11.70

Bracket No. 14

A handy wall-mounting bracket for 25.4 to 32mm diameter masts (1 to 1¼in.).

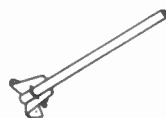


Order

BW44X (Mast Bracket Type 14) £3.35

Loft Bracket EM4

A stand-off arm or sturdy loft bracket size 305 x 19mm (12 x 0.75in.).

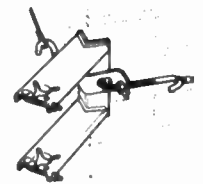


Order

BW45Y (Loft Bracket EM4) £2.10

Lashing Kit No.4

A single lashing with bracket to give 152mm (6in.) stand-off for masts up to 25.4mm (1in.) diameter.

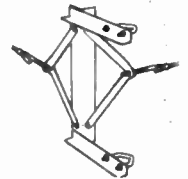


Order

XQ55K (Lashing Kit Type 4) £8.75

Lashing Kit No.6

A heavy duty single lashing with bracket to give 178mm (7in.) stand-off for masts of 1.5 to 2in. diameter.

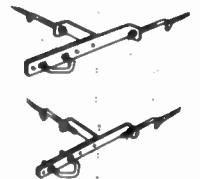


Order

XQ56L (Lashing Kit Type 6) £16.90

Lashing Kit No.7

A heavy duty double lashing with brackets to give 140mm (5.5in.) stand-off for masts up to 51mm (2in.) diameter.



Order

XQ57M (Lashing Kit Type 7) £16.45

Lashing Kit No.9

A single lashing with bracket to give 102mm (4in.) stand-off for 25.4 to 32mm diameter masts (1 to 1.25in.).



Order

XQ58N (Lashing Kit Type 9) £11.45

Mast Type D

A 914.4 x 25.4mm (3ft x 1in.) cranked mast giving a 229mm (9in.) stand-off. Manufactured in tubular aluminium, wall thickness 1.6mm.



Order

XQ60Q (Mast D) £3.65

Mast Type M

A 1524 x 25.4mm (5ft x 1in.) cranked mast giving a 356mm (14in.) stand-off. Manufactured in tubular aluminium, wall thickness 1.6mm.



Order

XQ63T (Mast M) £5.99

Mast Type E

A 1829 x 25.4mm (6ft x 1in.) straight mast. Manufactured in tubular aluminium, wall thickness 1.6mm.

Order

XQ61R (Mast E) £6.99

Delivery by Carrier. By mail-order please add carriage charge £5.50.

Mast Type G

A 3048 x 38mm (10ft x 1.5in.) straight mast. Manufactured in tubular aluminium, wall thickness 1.6mm.

Order

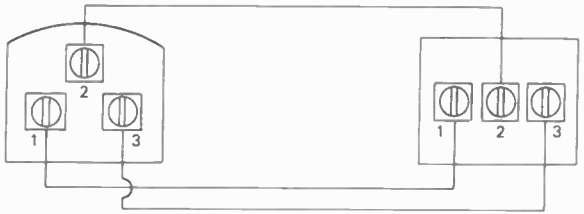
XQ62S (Mast G) £17.50

Delivery by Carrier. By mail-order please add carriage charge £5.50.

AERIAL ROTATORS



Two aerial rotators designed to turn and accurately position antennae, assuring the best possible signal. The smaller unit is suitable for use with TV or FM antennae, whilst the larger unit may be used with TV or FM multiple arrays and for Amateur Radio antennae up to a maximum weight of a quarter of a tonne. The antenna controller system consists of an aerial rotating mechanism which is roof mounted and a controller which is located at or near the TV set. The controller is silent in operation, using only reliable solid state electronic components. Antenna rotation is indicated by a pilot light in the controller. When the antenna has rotated to the desired position the pilot light will go out. The control system ensures positive alignment between the mechanism and controller and a high degree of repeat accuracy which is important for proper signal reception. The connecting cable between the control unit and the mechanism carries only safe, low voltage power.

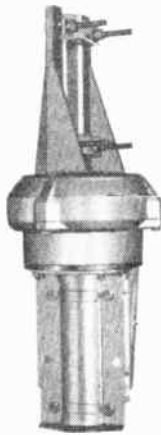


DRIVE UNIT

CONTROL BOX

Detailed but easy to follow instructions for fitting and use are supplied. No connecting cable is supplied; use 3-core 6A mains cable (XR03D) for lengths up to 30m, and 13A mains cable (XR09K) for lengths over 30m.

Aerial Rotator



Specifications

Supply: 100-120V/200-240V AC switchable @ 40VA
 Output to Motor: 24V AC
 Rotation: 360° + 15° with mechanical stop
 Rotation Time: 70 seconds full circle
 Torque: 200kg/cm/Min.
 Stationary Braking Torque: 1000kg/cm/Min.
 Acceptable Mast Diameter: 22-40mm
 Vertical Load: 50kg max.
 Wind Load Area: 0.25m²

Dimensions

Rotator: 152mmØ x 375mm high
 Weight: 3.1kg
 Control Unit:
 Width: 140mm
 Height: 71mm
 Depth: 180mm
 Weight: 600g

Order

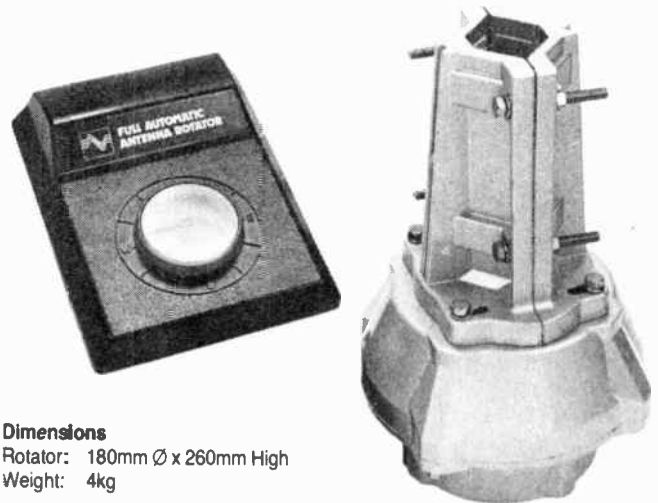
XB54J (Aerial Rotator) £44.95

Heavy Duty Aerial Rotator



Specifications

Supply: 100-120V/200-240V AC switchable @ 55VA
 Output to Motor: 24V AC
 Rotation: 360° + 15° with mechanical stop
 Rotation Time: 60 seconds full circle
 Torque: 450kg/cm/Min.
 Stationary Braking Torque: 2500kg/cm/Min.
 Acceptable Mast Diameter: 38-50mm
 Vertical Load: 250kg max.
 Wind Load Area: 0.4m²



Dimensions

Rotator: 180mm Ø x 260mm High
 Weight: 4kg

Control Unit:

Width: 140mm
 Height: 71mm
 Depth: 180mm
 Weight: 600g

Order

XG82D (H/Dty Aerial Rotator) £79.95

TV AND FM RADIO AERIAL AMPLIFIERS

Masthead Amplifiers



Two masthead amplifiers for UHF and VHF in a fully weatherproof housing complete with brackets for either mast or surface mounting. The power to drive the amplifier is 12V DC, and is fed to the amplifier from the special power unit BW50E, which must be bought separately, shown below.

	VHF (V)	UHF (W)
Bandwidth:	40 - 230MHz	470 - 860MHz
Typical Gain	19dB	13dB
Noise:	2.5 to 3dB	2.5 to 3dB

Order

BW46A (Masthead UP1300/W) £13.95
BW49D (Masthead UP1300/V) £13.95

Masthead Amp Power Unit

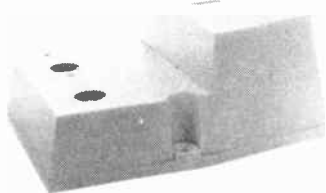
A power unit for use with our masthead amps UP1300/V and UP1300/W. Supplied with instructions and screws for fixing. It has co-ax sockets for both sides of the aerial head for easy connection, and includes approximately 1 metre of mains cable.



Order

BW50E (Power Unit PU1240) £16.99

Indoor Amplifier



Two indoor amplifiers, one for UHF TV, and one for VHF TV or FM. Both are suitable for either colour or black and white TV. These amplifiers will improve weak signals, but if the poor signal quality is due to interference the amplifier will probably make things worse. Very simple to install, each amplifier comes with complete instructions. They have very low power consumption, and are safe to leave on indefinitely.

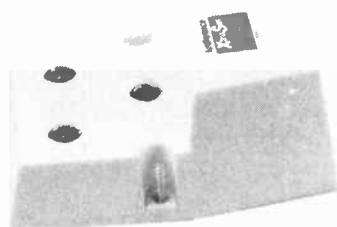
	XB1U	VX1B
Bandwidth:	470 – 860MHz	40– 230MHz
Nominal Gain:	10dB	12dB
Max output:	30dBmV	34dBmV
Noise:	4dB	3.5dB
Input/Output impedance	75Ω	75Ω

Supplied with approximately 1 metre of mains cable.

Order

YX73Q (Amp XB1U)	£21.99
BK06G (Amp VX1B)	£21.99

Amplifier for Second TV or Radio



An amplifier specially designed to overcome the losses in a splitter unit and extra cable when one aerial is used to drive two TV sets. Unit is in an easily fitted smart white box 120 x 90 x 51mm deep which simply plugs into mains. It has three co-axial sockets; one for the aerial, one for TV set 1 and one for TV set 2. For use with all VHF and UHF TV and FM radio channels.

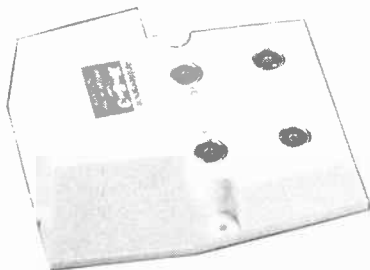
	VHF	UHF
Bandwidth:	40 to 860MHz	
Typical Gain:	7.5dB	6.5dB
Max output:	22dBmV	20dBmV
Channel Isolation:		16dB
Input/Output impedance:		75Ω
Noise:		<3.5dB

Supplied with instructions and 1m of mains cable.

Order

YQ22Y (Xtra Set Amp)	£21.99
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Amplifier for Second or Third Radio or TV



An amplifier similar to the above, but with the ability to drive three sets from one aerial. For use with all VHF and UHF TV and FM radio channels.

	VHF	UHF
Bandwidth:	40 – 860MHz	
Nominal Gain:	7.5dB	5.5dB
Max. output:		35dBmV
Channel Isolation:		19dB
Input/Output impedance:		75Ω
Noise:		5.5dB

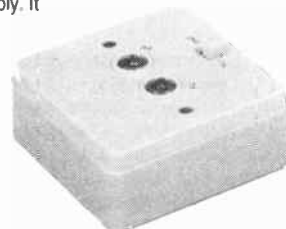
Supplied with instructions and 1m of mains cable.

Order

BK75S (Xtra Set 3 Amp)	£29.95
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Battery Powered Aerial Amplifier

This amplifier is specially designed for use with portable UHF/TV receivers where an AC mains supply is not available. It is ideal for use in caravans, boats, etc., where, if desired, it can be operated from either an internal 9V (PP3) battery, or an external 12V DC supply. It should treble any incoming signal.



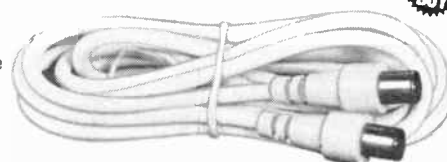
Bandwidth:	470 – 860MHz
Nominal Gain:	9 to 10dB
Max. output:	34dBmV
Supply Voltage:	9 – 12V DC
Current consumption:	2.5mA @ 9V
Input/output impedance:	75Ω

Order

BK76H (TV Amp XB12)	£15.95
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TV Aerial Flylead

2 metres of co-axial cable with a co-ax plug ready connected at both ends.



STAR BUY

Order

RW36P (Plugpak 200)	98p
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DIPLEXERS AND SPLITTERS

VHF/UHF Diplexer

A masthead or surface mounting diplexer for combining or separating VHF and UHF signals from antenna downloads.

	VHF	UHF
Bandwidth:	40 – 230MHz	470 – 860MHz
Insertion loss:	0.75dB	1.0dB
Channel Isolation:	20dB (typical)	

Order

BW51F (Diplexer UF20)	£7.75
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Combiner/Splitter

A 'professional' non-resistive, low-loss unit for combining antenna downloads or dividing equally the signals on one download. Supplied in a weatherproof housing, a masthead amplifier can be powered through this unit. Suitable for mast or surface mounting.

Frequency range:	40 – 860MHz
Insertion loss:	4.0dB

Order

BW52G (Splitter CS1000)	£6.90
--------------------------------------	--------------

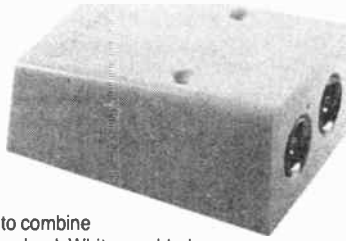
Surface Mounting Splitter Unit

A splitter unit for surface mounting, where the aerial lead enters at rear and is clamped internally. First TV set is connected to co-ax socket and second TV is connected via second hole in rear to internal screw fixing. White moulded housing and fixing screws provided. No soldering required. Overall size: 55 x 40 x 29mm.

Order

HX88V (Aerial Splitter SB11)	£3.65
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Surface-Mounting Combiner/Splitter



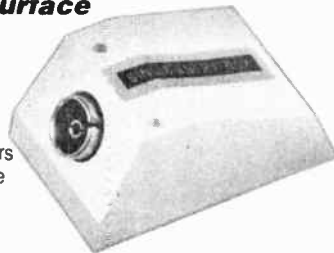
A unit similar to HX88V except that both TV sets are connected to co-ax sockets on the front. This unit also differs in that it is non-resistive and therefore offers less loss. It may also be used in reverse to combine two signals via the co-ax sockets onto one lead. White moulded housing and fixing screws supplied. No soldering required. Overall size: 63 x 44 x 29mm.

Order

YQ23A (Splitter CS200) £5.70

TV AND FM OUTLETS

Single Co-axial Outlet Surface



A surface mounting co-ax outlet in a moulded white housing. Co-ax cable enters from rear and is screw terminated. For use with VHF or UHF signals. Overall size: 50 x 28 x 24mm.

Order

HX87U (Surface Co-Ax Outlet) £1.20

Double Co-axial Outlet Surface

As HX87U, but with two completely separate co-ax sockets and screw terminals in rear for two separate cables. Overall size: 63 x 44 x 29mm.

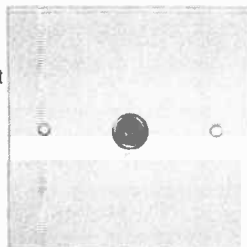


Order

BW54J (Sice Dble Co-Ax Otlt) £2.45

Single Co-axial Outlet Flush

A flush mounting co-ax outlet with a white thermoset front plate. Fits standard conduit and surface boxes (see electrical accessories) to BS1363. Screws supplied. No soldering required. For use with VHF or UHF signals. Front 85mm square. Depth (from rear of plastic moulding) 15mm.

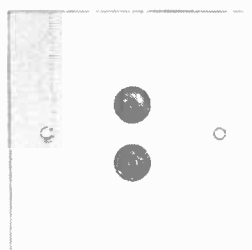


Order

BW55K (Flush Co-Ax Outlet) £1.45

Double Co-axial Outlet Flush

As BW55K, but with two completely separate co-ax sockets and screw terminals inside for two separate cables. Overall size: 85mm square. Depth (from rear of plastic moulding): 15mm.



Order

BW56L (Flsh Dbl Co-Ax Outlt) £1.95

TV/FM Diplexer

A surface mounting integral diplexer which separates the UHF TV signals from the FM radio signals which have been combined on one downlead. Screw fixing for co-ax cable at rear, two co-ax sockets at the front, one marked TV and one marked FM. In a white moulded housing with fixing screws supplied. Overall size: 63 x 44 x 29mm.



Order

BW57M (TV/FM Outlet) £4.95

Aerial Switch

A surface mounting aerial switch in a white moulded housing. For switching a TV or FM receiver from one aerial to another. Or it can be used to switch one downlead from one receiver to another. Screw fixing at rear for two separate co-axial downleads and one standard co-ax socket at the front. Supplied with fixing screws. Overall size: 63 x 44 x 29mm.



Order

BW58N (Aerial Switch) £4.95

Balun

A receiver transformer to enable 75Ω co-ax downleads to be used when FM receiver has 240 to 300Ω balanced aerial input. To fit the Balun to the coaxial downlead; remove the plastic case by gently squeezing the two narrow sides together until the wider sides have 'bowed out' enough to make the removal of the insert possible. Thread the outer case on the coax cable and connect the cable to the terminal and metal clamp on the balun circuit board. Overall size: 75 x 50 x 25mm.



Order

LB09K (75/300 Balun) £1.98

Attenuators

For in-line connection. Standard coax socket at one end, standard coax plug at other end. In bright aluminium alloy bodies and suitable for VHF and UHF. They have low VSWR and are clearly marked. Three types available.

3dB
6dB
12dB

Length 45mm (approx.)



Order

RK47B (3dB Attenuator) £1.80
BW59P (Attenuator 6dB) £1.80
BW60Q (Attenuator 12dB) £1.80

FM Aerial



A folded dipole aerial for indoor use. Suitable for use at frequencies 88-108MHz (each side is exactly a 1/4 wavelength at 98MHz). Supplied with 1.75m of downlead terminated with spade connectors. Impedance: 300Ω balanced.

Order

LB11M (FM Tape Aerial) 98p

Ferrite Rod Aerial



A 5in long x .375in diameter ferrite rod onto which a medium wave and long wave coil are wound. Coils may be moved on rod for best performance (then fixed with a suitable adhesive). Designed to be used with our twin OO tuning capacitor, and may also be used with the AM/FM varitone. Inductance of medium wave coil: 370 μ H; long wave coil: 4.1mH.

Typical coverage: medium wave — 550 to 1550kHz (193m to 545m).
Long wave — 150 to 280kHz (1070 to 2000m).

Supplied with circuit diagram which can form the basis of a complete LW/MW radio with output amplifier, and using the TOC1 as local oscillator (see Wound Components). Setting up data included. However we recommend that the germanium PNP devices shown should be ignored in favour of their nearest silicon equivalents.

Order

LB12N (MW/LW Aerial) £2.95

TELESCOPIC AERIALS

Low Cost



STAR BUY

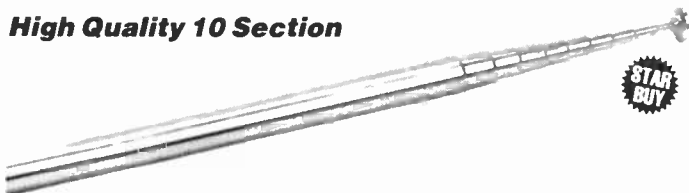
Two low cost telescopic aerials, one eight-section and one six-section. The eight-section type is 925mm (36ins) long, and the six-section type is 600mm (24ins) long. The base sections are respectively 8mm and 6mm in diameter, and a threaded hole is tapped to M3 in the centre of the bottom.

Order

RK48C (8-Section Antenna) £1.98

RK49D (6-Section Antenna) £1.60

High Quality 10 Section



STAR BUY

A high quality ten section telescopic aerial extending to 1.16m (46ins) and heavily chromed. Base section is 9mm diameter and a threaded hole is tapped in the centre at the bottom.

Order

LB10L (Telescopic Aerial 1.16m) £2.95

FLEXIBLE ANTENNAE

27MHz



A flexible rubber antenna for the 27MHz band. Excellent SWR to handheld equipment and offering small size, unbreakable durability and gain approaching quarter wave. Overall length: 355mm. Terminated in a detachable PL259 UHF plug.

Order

YG41U (27MHz Rubber Duck) £4.95

2m Band



A flexible rubber antenna for the 2m band. Excellent SWR to hand-held equipment and offering small size, unbreakable, and gain approaching quarter wave. Overall length: 200mm. Terminated in a BNC plug.

Order

YG15R (2m Rubber Duck) £3.95

CAR RADIO AERIALS

Wing Mounting Aerial

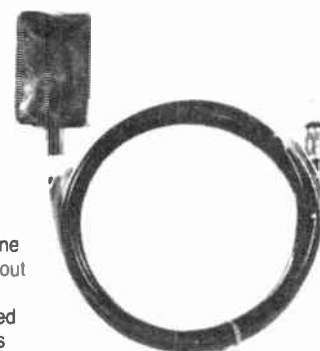


A fully retractable four-section telescopic car radio aerial for wing mounting. Aerial retracts into plastic cylinder and can be pulled up with a key (two supplied) which fits into slots in top of aerial. Fully extended length: 980mm. Underhang: 270mm. Aerial is chromed and supplied fitted with 1175mm of lead with car radio plug fitted, and through-chassis grommet supplied. A bar is also supplied which clamps the bottom of the plastic cylinder so that the aerial is firmly secured.

Order

HW18U (Car Aerial Pull Up) £2.99

Windscreen Mounting Aerial



A crystal clear self-adhesive polypropylene film tape that will not crack, yellow or dry out even in extreme heat or cold. The tape is connected to 1m of co-ax cable terminated in a car aerial plug. This type of aerial has many advantages over externally fitted aerials.

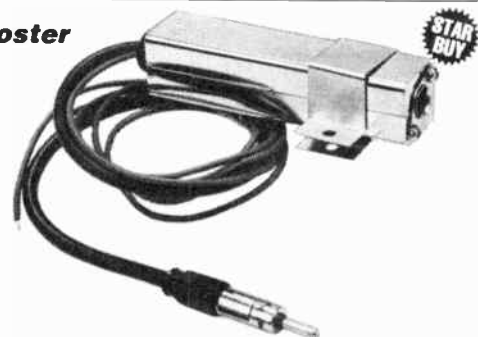
1. It is much longer, giving an improvement on AM reception and it has vertical and horizontal components giving an improvement on FM reception.
2. As it is internal it cannot be stolen or snapped off (in car washes for example).
3. Easy to install — no holes to drill in car body.
4. Fits any car.

A chrome blanking grommet is supplied to fill hole where wing-mounted aerial was previously fitted.

Order

LH99H (Windscreen Aerial) £3.99

Car Aerial Booster



STAR BUY

A high gain car aerial booster amplifier covering the Long, Medium, Short and VHF wavebands. The unit simply plugs into your radio and the existing aerial lead plugs into the amplifier.

The unit will give a largely noise-free reception on previously noisy FM stations and a big increase in signal strength on weak AM stations. The unit is only suitable for use with negative earth cars, and the red lead from the amplifier must be connected to +12V DC, while the amplifier must be earthed via its fixing bracket.

Specification

Supply: +12V DC @ 10mA \pm 2mA

Bandwidth:

LW 150 – 300kHz
MW 530 – 1605kHz
SW 3 – 12MHz
VHF 88 – 108MHz

Input capacitance

80pF \pm 10pF

Dimensions:

100mm long x 22mm square.

Co-ax cable:

31cm long terminated in car aerial plug.

Supply wire:

1 metre unterminated.

Order

XX37S (Car Aerial Booster) £4.99

BATTERIES

Battery Clips 41
Battery Holders 42

Dry Batteries 38
Dummy Battery 42

Mains Adaptors 41
Nickel Cadmium Cells 40

RECHARGEABLE LEAD-ACID BATTERIES

NEW

Introducing a range of maintenance free, sealed construction lead-acid batteries combining small size with high output and long life, in 4V, 6V and 12V versions from 3Ah to 65Ah. The batteries are classified as 'non-spillable', having unique sealing techniques to guarantee that no electrolyte leakage can occur. The batteries are provided with a means of recombining gas internally during normal usage, and in the event that a build-up of gas at excessive pressure should occur, a low pressure venting system, operating at 7 to 10 psi, will dispel the excess and automatically re-seal itself.

The 'non-spillable' feature of these batteries means that they can be operated in any position, unlike the usual form of vented lead-acid battery which is strictly 'one-way-up'. A service life of 5 years should be expected if the batteries are used most often in the 'floating' or 'standby' modes of operation, where top-up trickle charging is regular and discharge is infrequent. The batteries also feature a low 'self discharge' rate of only 3% of rated capacity per month, allowing the battery to be left unused for some period without loss of efficiency or any appreciable deterioration of performance.

Charging

Because these lead-acid batteries are sealed, some care has to be exercised whilst charging, and it is recommended that a stabilised, constant voltage source should be used, with current limiting proportional to the battery's Ah rating; a typical circuit is shown below.

Car battery type chargers must never be used.

Battery performance and service life will be directly affected by the choice and efficiency of the charging circuit used. Constant voltage charging is the most suitable method, and the output must be within 2.25 to 2.30 volts per cell for trickle charging, or in the case of 'cyclic' use (regular discharging) 2.40 to 2.50 volts per cell. It is also recommended that the current output be normally limited to a maximum of 0.25 x rated capacity of the battery (where Ah represents a ratio of current output versus time, e.g. 10Ah = 1 ampere discharge over 10 hours, or 10 amperes over 1 hour). Charging outside these limits will seriously damage the battery.

These batteries, unlike some other makes, can recover full capacity even after they have been subjected to extreme overdischarge unless left standing in a totally discharged state for a long period.

Terminations

The 4V, 6V and 12V batteries YJ65V to XG77J have a pair of moulded-in blade terminals which can accept the 1/4in. push-on connectors shown in the Connectors section. XG78K to XG81C have terminals with which M5, and in the case of XG81C, M6, bolts and nuts are used. These are supplied.

Suitably sized metric solder tags for use with these fittings may be found in the Hardware section - though note that neither of these methods of termination may be able to adequately cope with the maximum short duration discharge current from any battery.

All batteries are encased in grey high impact ABS plastic resin, with black sealed top covers.

YJ65 4V 3Ah

XG70M 6V 4Ah

YJ68Y 6V 2.6Ah

XG76H 12V 4Ah

YJ67X 6V 1.2Ah

YJ66W 6V 1Ah

XG74R 12V 1.9Ah

XG75S 12V 2.6Ah

YJ69A 12V 1.2Ah

XG72P 6V 8Ah

XG73Q 6V 10Ah

XG78K 12V 15Ah

XG77J 12V 6Ah

XG79L 12V 24Ah

XG71N 6V 6Ah

XG80B 12V 38Ah

XG81C 12V 65Ah

For circuit of a suitable charger, see LM317 in Semiconductor Section.

Code	Type	Dimensions	Weight	Voltage	Capacity	Short duration max. discharge	Preferred constant V charging @ A max.	
							For Cycle use:	For Standby use:
YJ65V	NP 3-4	90 x 65 x 35mm	430gm	4V	3Ah	100A	4.8 - 5.0V @ 0.75A max.	4.50 - 4.60V @ 6A max.
YJ66W	NP 1-6	51 x 55 x 42mm	250gm	6V	1Ah	45A	7.2 - 7.5V @ 0.25A max.	6.75 - 6.90V @ 2A max.
YJ67X	NP 1.2-6	97 x 54 x 25mm	300gm	6V	1.2Ah	45A	7.2 - 7.5V @ 0.3A max.	6.75 - 6.90V @ 2.4A max.
YJ68Y	NP 2.6-6	134 x 64 x 34mm	560gm	6V	2.6Ah	100A	7.2 - 7.5V @ 0.65A max.	6.75 - 6.90V @ 5.2A max.
XG70M	NP 4-6	70 x 108 x 46mm	850gm	6V	4Ah	120A	7.2 - 7.5V @ 1A max.	6.75 - 6.90V @ 8A max.
XG71N	NP 6-6	151 x 98 x 33mm	1.25kg	6V	6Ah	180A	7.2 - 7.5V @ 1.5A max.	6.75 - 6.90V @ 12A max.
XG72P	NP 8-6	151 x 98 x 50mm	1.8kg	6V	8Ah	300A	7.2 - 7.5V @ 2A max.	6.75 - 6.90V @ 16A max.
XG73Q	NP 10-6	151 x 98 x 50mm	2kg	6V	10Ah	300A	7.2 - 7.5V @ 2.5A max.	6.75 - 6.90V @ 20A max.
YJ69A	NP 1.2-12	97 x 55 x 47mm	600gm	12V	1.2Ah	45A	14.4 - 15V @ 0.3A max.	13.5 - 13.8V @ 2.4A max.
XG74R	NP 1.9-12	178 x 66 x 34mm	830gm	12V	1.9Ah	75A	14.4 - 15V @ 0.475A max.	13.5 - 13.8V @ 3.8A max.
XG75S	NP 2.6-12	134 x 64 x 68mm	1.1kg	12V	2.6Ah	100A	14.4 - 15V @ 0.65A max.	13.5 - 13.8V @ 5.2A max.
XG76H	NP 4-12	90 x 105 x 70mm	1.75kg	12V	4Ah	120A	14.4 - 15V @ 1A max.	13.5 - 13.8V @ 8A max.
XG77J	NP 6-12	151 x 98 x 65mm	2.4kg	12V	6Ah	180A	14.4 - 15V @ 1.5A max.	13.5 - 13.8V @ 12A max.
XG78K	NP 15-12	180 x 167 x 76mm	5.9kg	12V	15Ah	400A	14.4 - 15V @ 3.75A max.	13.5 - 13.8V @ 30A max.
XG79L	NP 24-12B	175 x 125 x 165mm	8.65kg	12V	24Ah	500A	14.4 - 15V @ 6A max.	13.5 - 13.8V @ 48A max.
XG80B	NP 38-12	196 x 170 x 165mm	13.8kg	12V	38Ah	500A	14.4 - 15V @ 9.5A max.	13.5 - 13.8V @ 76A max.
XG81C	NP 65-12	350 x 175 x 165mm	22.7kg	12V	65Ah	800A	14.4 - 15V @ 16.25A max.	13.5 - 13.8V @ 130A max.

Order		
YJ65V (3Ah Lead Acid Bat 4V)	£9.95	XG72P (8Ah Lead Acid Bat 6V)
YJ66W (1Ah Lead Acid Bat 6V)	£6.60	XG73Q (10Ah Ld Acid Bat 6V)
YJ67X (1.2Ah Ld Acid Bat 6V)	£7.70	YJ69A (1.2Ah L/Acid Bat 12V)
YJ68Y (2.6Ah Ld Acid Bat 6V)	£8.70	XG74R (1.9Ah L/Acid Bat 12V)
XG70M (4Ah Lead Acid Bat 6V)	£10.95	XG75S (2.6Ah L/Acid Bat 12V)
XG71N (6Ah Lead Acid Bat 6V)	£12.95	XG80B (38Ah L/Acid Bat 12V)
		XG81C (65Ah L/Acid Bat 12V)

DRY BATTERIES

Blue Seal



Blue Seal continues the traditional range of blue coloured zinc-carbon batteries from Ever Ready, and are, as before, suitable for a wide range of applications where the total power requirement is relatively low, for example in transistor radios and torches which receive average use. Careful chemical formulation ensures consistently good performance, provided the current drain required is of modest proportions.

Silver Seal

The Silver Seal range replaces the previous High Power and Power Plus groups. A zinc-chloride formulation provides for a good life expectancy when used in



equipment which receives average or intermittent use, and which can be twice that of Power Plus cells when used in appliances on a heavy or continuous basis. The life expectancy is two and a half times that of the Blue Seal range, and Silver Seal batteries are guaranteed leak-proof!

Gold Seal



A new development of long life, alkaline batteries. Gold Seal has been specially developed to give a premium performance in all appliances demanding a high current drain, where typical usage is on a heavy or continuous basis. In addition Gold Seal batteries have a longer 'un-used' life during which time maximum power is immediately available giving excellent 'non-fade' performance. The Gold Seal range also offers maximum protection against leakage.

A Guide To Battery Choice

Daily Use

	Appliance		
Up to 1 hour	Radio	Hand Lamp	Flashgun
1 to 4 hours	Torch	Cycle Lamp	Motorwind
Over 4 Hours	Calculator	Small Cassette	Hi-fi Cassette
	Shaver	Motorised Toy	Table-top Game
	Toothbrush	Hand-held Game	Radio-controlled Toy
	Blue Seal	Silver Seal	Gold Seal
	Silver Seal	Silver Seal	Gold Seal
	Silver Seal	Gold Seal	Gold Seal

Use Silver Seal also for clocks, doorbells and gas ignition.

Types Available

Voltage	Old Type	Dimensions (mm)	Blue Seal	Silver Seal	Gold Seal
1.5V	HP16 (AAA)	44.5 x 10.5	R03B	-	LR03
1.5V	HP7 (AA)	50 x 15	R6B	R6S	LR6
1.5V	HP11 (C)	50 x 26	R14B	R14S	LR14
1.5V	HP2 (D)	62 x 34	R20B	R20S	LR20
9V	PP3	26.5 x 17.5 x 48.5 high	PP3B	PP3S	6LF22

Order

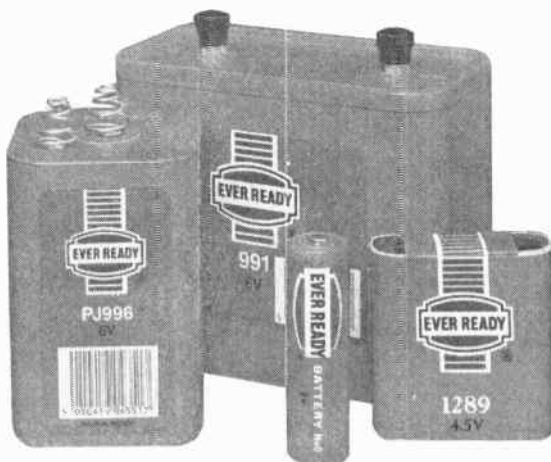
FK54J (Blue Seal R03B)	22p
FK55K (Blue Seal R6B)	19p
FK56L (Blue Seal R14B)	32p
FK57M (Blue Seal R20B)	35p
FK58N (Blue Seal PP3B)	70p
FK59P (Silver Seal R6S)	28p
FK60Q (Silver Seal R14S)	45p
FK61R (Silver Seal R20S)	50p
FK62S (Silver Seal PP3S)	97p
FK63T (Gold Seal LR03)	53p
FK64U (Gold Seal LR6)	53p
FK65V (Gold Seal LR14)	96p
FK66W (Gold Seal LR20)	£1.06
FK67X (Gold Seal 6LF22)	£1.99

Lighting and General Purpose Batteries

There is also a wide choice of general purpose batteries for miscellaneous applications, such as doorbells, valve radios, and burglar alarms etc.



Voltage	Dimensions (mm)	Type	Terminals
1.5V	67 dia. x 172 high	Flag	Screw
1.5V	67 x 67 x 110 high	993	Screw
3V	21.8 dia. x 74.6 high	No.8	Stud
4.5V	62 x 22 x 67 high	1289	Flat Spring
4.5V	102 x 35 x 106 high	AD28	Socket
4.5V	103 x 35 x 92 high	126	Screw
6V	67 x 67 x 102 high	PJ996	Coiled Spring
6V	137 x 73 x 127 high	991	Screw
6V	67 x 67 x 110 high	HP992	Screw
12V	134 x 68 x 137 high	HP1	Socket



Order

FK68Y (Gen Purpose No.8)	38p
FK69A (Gen Purpose 1289)	80p
YJ18U (Gen Purpose PJ996)	£2.43
YJ19V (Gen Purpose 991)	£6.92
YJ20W (Gen Purpose 993)	£3.11
YJ21X (Gen Purpose AD28)	£2.84
YJ22Y (Gen Purpose HP1)	£10.87
YJ23A (Gen Purpose HP992)	£3.56
FK70M (Gen Purpose 126)	£2.13
FK71N (Gen Purpose FLAG)	£4.06

Transistor Power Packs



A range of batteries especially developed for transistorised equipment where maximum performance in the minimum space is required. In addition to the common 9V types, 6V and 4.5V versions are also available.

Voltage	Dimensions (mm)	Type	Terminals
4.5V + 4.5V*	65.1 x 52.4 x 91.3 high	PP11	4 Socket
6V	65.1 x 55.6 x 55.6 high	PP1	Like PP9
6V	65.1 x 51.6 x 200.8 high	PP8	Like PP9
9V	36 x 34.5 x 70.4 high	PP6	Like PP3
9V	46 x 46 x 62.2 high	PP7	Like PP9
9V	66 x 52 x 81 high	PP9	PP9-type

*Can be connected in series or parallel externally.

Order

FM02C (Trans Pwr PP11 6V)	£1.73
FM03D (Trans Pwr PP6 9V)	£1.47
FM04E (Trans Pwr PP7 9V)	£1.47
YJ24B (Trans Pwr PP8 6V)	£5.29
FM05F (Trans Pwr PP9 9V)	£1.49
FM06G (Trans Pwr PP11 4.5V2)	£3.10

Photographic and Test Meter Batteries



A range of alkaline and silver oxide cells as used in photographic equipment and many test meters. Also see Mercuric Oxide range below.

Voltage	Dimensions (mm)	Type	Construction
1.5V	12 dia. x 30 high	LR1	Alkaline
6V	13 dia. x 26 high	PX28	Silver Oxide
15V	27 x 16 x 37 high	BLR121	Alkaline
15V	16 x 15 x 35 high	BLR154	Alkaline
22.5V	27 x 16 x 51 high	BLR122	Alkaline

Order

FM13P (Gold Seal LR1)	55p
FM07H (Photo Batt BLR121)	£2.72
FM08J (Photo Batt BLR122)	£3.67
FM09K (Photo Batt BLR154)	£2.72
QY67X (Photo-Test PX28)	£3.41

Mercuric Oxide Batteries

Recommended for use in a wide range of electronic, photographic, scientific and test equipment applications where the small size, stable voltage characteristics and long life are particularly suitable. These batteries are also for use in hearing aids.



Voltage	Dimensions (mm)	Type
1.35V	16.4 dia. x 16.8 high	PX1/RM1N
1.35V	16 dia. x 6.2 high	PX/RM625
1.35V	11.6 dia. x 5.4 high	PX675
1.4V	8 dia. x 5.4 high	RM13H
1.4V	12 dia. x 30.2 high	BP401
1.4V	11.6 dia. x 5.4 high	BP675
1.4V	11.6 dia. x 5.4 high	RM675H

Order

FM14Q (Merc Batt PX1/RM1N)	£1.13
FM18U (Merc Batt PX/RM625)	61p
FM20W (Merc Batt PX675)	55p
FM21X (Merc Batt RM13H)	34p
FM22Y (Merc Batt BP401)	96p
FM23A (Merc Batt RM675H)	36p
FM24B (Merc Batt BP675)	43p

Zinc Air Batteries

A revolutionary battery system specifically designed for use in hearing aids where it will give twice the life of mercury type batteries. A zinc-air battery is interchangeable with any similarly numbered mercuric-oxide battery and is activated by removing the sealing tab on the base of the battery immediately prior to use.

Voltage	Dimensions (mm)	Type
1.4V	11.6 dia. x 5.4 high	A675
1.4V	7.9 dia. x 5.4 high	A13



Order

FM26D (Zinc Air A675)	56p
FM27E (Zinc Air A13)	47p

Silver Oxide Watch and Calculator Batteries



Especially recommended for quartz watches and small calculators where the long and stable discharge characteristics are important. The high drain types (suffix H) are for watch or calculator applications requiring the battery to possess a pulse surge capability; the low drain series (suffix L) being suitable for quartz analogue watches and calculators without backlight or alarm.

Voltage	Dimensions (mm)	Type
1.5V	6.8 dia. x 2.1 high	B-SR60L
1.5V	8 dia. x 2.1 high	B-SR58L
1.5V	8 dia. x 2.6 high	B-SR59L
1.5V	8 dia. x 3.6 high	B-SR41H
1.5V	8 dia. x 5.4 high	B-SR48H
1.5V	11.6 dia. x 3.5 high	B-SR54H
1.5V	11.6 dia. x 4.2 high	B-SR43H
1.5V	11.6 dia. x 5.4 high	B-SR44H

Order

FM36P (Silver Batt B-SR60L)	£1.20
FM33L (Silver Batt B-SR58L)	£1.20
FM35Q (Silver Batt B-SR59L)	£1.20
FM30H (Silver B-SR41H)	92p
FM32K (Silver Batt B-SR48H)	£1.18
FM31J (Silver B-SR54H)	£1.13
FM29G (Silver B-SR43H)	£1.31
FM28F (Silver B-SR44H)	£1.18

SEALED NICKEL CADMIUM BATTERIES

A range of nickel cadmium cells which will replace dry batteries in medium and high current applications. They are very economical in applications where dry batteries constantly need replacing. They must be recharged using special constant current chargers, but even adding the cost of the charger to the cost of the batteries, they still show a considerable saving over dry batteries after just a few changes. Nickel cadmium cells are not suitable for use in very low power equipment such as electric clocks, and any similar application where a dry cell would only need replacing once a year. Cells are usually supplied discharged in case they are accidentally shorted in transit. It is important never to short circuit nickel cadmium cells, because their very low internal resistance allows very high currents to flow, which may damage the cell.

These high quality, professional cells have sintered plates to give a very low internal resistance. The positive is nickel hydroxide, cadmium is the negative, and the electrolyte is potassium hydroxide. These cells are fitted with a re-sealing one-way safety vent that relieves any excess internal pressure caused by a fault or abuse. It opens at about 200 psi and closes again at about 175 psi. Typical abuse conditions would be charging at too high a current or excessive reverse charging.

A battery is by nature a chemical device, and is therefore affected by temperature in a variety of ways. Below the freezing temperature of the electrolyte (about -30°C) the ni-cad battery will not work. At low temperatures, however, the charging process becomes more efficient, and for continuous charging under these conditions an upper charge voltage limit of 1.55V per cell is often imposed. This means that circuits are designed so that as this voltage is approached the charging current will decrease, so the upper voltage limit is not exceeded. This will greatly reduce the possibility of gassing under these very efficient charge conditions. Temperature will also affect retention of charge on standing, this being much better at lower temperatures.

All the batteries in this catalogue should have a minimum life of at least 500 full charge/discharge cycles. Providing that the charge rate never exceeds the maximum current stated and the discharge rate never exceeds twice that current, the life should be around 3000 full charge/discharge cycles. Cells may be charged at any current up to the maximum stated, but will take progressively longer to charge at lower currents. No harm will result if the cells are charged for longer periods.

Re-Chargeable Type AA Battery

In normal cycling the cells should be charged using constant current of between 25mA and 64mA until they have been charged to 0.75Ah. However, fully discharged cells at temperatures of 20 to 45 degrees C can safely be recharged at a rate of 0.5A for an absolute maximum of 1-25 hours. Considerably faster charging can be used, but under these conditions cells should not be charged to more than 0.4Ah, and precautions should be taken to prevent overheating. Cells may also be continuously charged at temperatures of between 10 and 40 degrees C using constant currents from 25mA to 65mA. At room temperature using normal charging conditions the cell voltage increases from an initial 1.2V to an end-of-charge voltage of approximately 1.45V.

Nominal capacity:	500mAh
Nominal voltage:	1.2V
Height x diameter:	50 x 14-3mm
Weight:	27 grammes



Order

YG00A (Ni Cad AA)	£1.40
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Re-Chargeable Type C Batteries

A replacement for the HP11 battery. This cell is available in both commercial (1200mAh - the type you will find in most shops) and industrial (1800mAh) types. The industrial type is designed for use by manufacturers and may therefore be supplied in a plain white sleeve.

Nominal capacity:	1200mAh (Commercial type) 1800mAh (Industrial type)
Nominal voltage:	1.2V
Max. charging current:	120mA (Commercial type) 180mA (Industrial type)
Max. charging voltage:	1.6V
Charging time:	14 to 16 hours
Height x diameter:	50 x 26mm
Weight:	73 grammes



Order

FV69A (Ni-cad C 1200mAh)	£2.25
YG02C (Ni-cad C 1800mAh)	£2.95

Re-Chargeable Type D Batteries

A replacement for the HP2 battery. This cell is available in both commercial (1200mAh – the type you will find in most shops) and industrial (4000mAh) types. The industrial type is designed for use by manufacturers and may therefore be supplied in a plain white sleeve.

Nominal capacity:	1200mAh (Commercial type) 4000mAh (Industrial type)
Nominal voltage:	1.2V
Max. charging current:	120mA (Commercial type) 400mA (Industrial type)
Max. charging voltage:	1.6V
Charging time:	14 to 16 hours
Height x diameter:	61 x 33mm
Weight:	155 grammes



Order

FV70M (Ni-cad D 1200mAh)	£2.40
YG03D (Ni-cad D 4000mAh)	£4.50

Re-Chargeable PP3 Battery

A direct replacement for the popular PP3 (6F22) size battery. It is extremely cost-effective over a period of time as it may be recharged at least 500 times even under full discharge/recharge conditions provided that ratings are not exceeded.

Nominal capacity:	110mAh
Nominal voltage:	9V
Max. charging current:	11mA
Max. charging voltage:	11V
Charging time:	12 to 15 hours
Size:	48.5 x 25.5 x 16.5mm
Weight:	45g



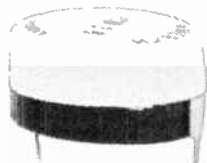
Order

HW31J (Nicaid PP3)	£5.95
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PCB Mounting Battery

Specially designed as a cost effective power back-up, these batteries offer extended working life combined with a sealed leak-proof construction. With a nominal capacity of 110mAh and excellent charge-retention characteristics they offer good protection against extended supply interruption. Their lower internal resistance also makes them suitable for high-current power back-up applications. Charge may be maintained by a trickle current of 0.5 – 1.0mA with no requirement for regulation or smoothing.

Nominal capacity at 22mA discharge rate:	110mAh/2.7V
Nominal voltage:	3.6V
Max. charging current:	11mA
Trickle charge:	1mA
Discharge current:	165mA max.
Height x diameter:	13.3 x 23.5mm
Pulse:	1.5A for 2 sec. max.



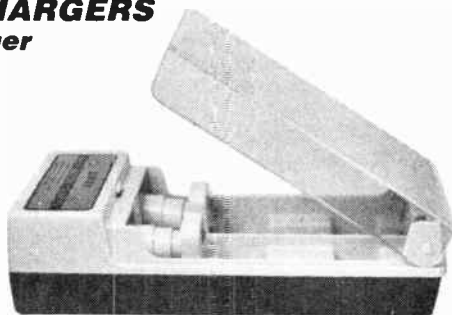
Order

RK46A (PCB Mountg 3.6V Bat)	£3.95
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NICKEL CADMIUM BATTERY CHARGERS

Compact Charger

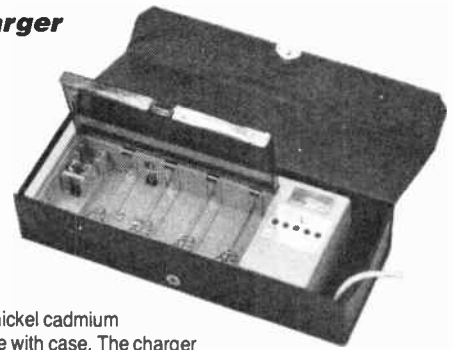
A compact nickel cadmium charger capable of charging 2–4 nickel cadmium cells simultaneously. The unit will charge AA, C or D size cells, or two each of two different types of cells at the same time. Charging rate for AA cells is 50mA, and for C and D size cells 150mA. Thus charging time for AA cells is 15 hours, for C cells is 20 hours and for D cells is 45 hours, for a completely discharged cell. The unit is finished in two tone grey with a transparent, hinged, acrylic cover and is fitted with 1¼m of mains lead. Overall size: 200 x 100 x 55mm.



Order

WY22Y (Ni-Cad Charger)	£6.95
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Universal Charger



An attractively finished nickel cadmium battery charger complete with case. The charger will accept almost any size battery or button cell, and up to four AA, C, or D types can be charged simultaneously. The unit has a hinged plastic dust cover. The five main battery positions have LED 'charge' indicators, and a press button 'test' facility will give an indication of the current state of charge. The overall size is 260mm long x 100mm deep x 50mm high. Supplied with approximately 1.8m of mains lead.

Order

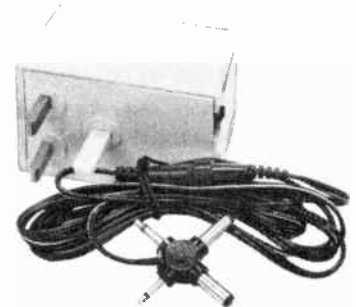
YK31J (Univsl Ni-Cad Chrgr)	£9.95
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MAINS ADAPTORS

Mains adaptor/battery eliminators which plug directly into standard 13A sockets. Each unit has approximately 1.75m of lead terminated in a multiplug unit having 2.5mm and 3.5mm jack plugs and 2.1mm and 2.5mm dc power plugs to suit most battery powered equipment. Polarity is reversible on all types and they all meet British Standard Specifications.

Regulated

This unit is regulated to keep the output voltage constant at all currents up to 300mA, and which is switchable for 6V, 7.5V and 9V DC output.

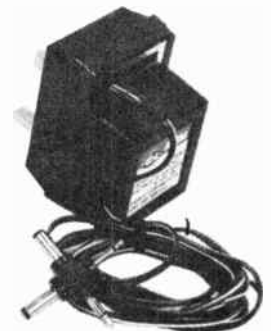


Order

YB23A (AC Adaptor Regulated)	£9.95
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Unregulated

This unit has outputs of 3, 4.5, 6, 7.5, 9 and 12V DC at 300mA (max). Unit is not stabilised and therefore at low current drains the voltage rises. At less than 150mA this rise could be considerable.



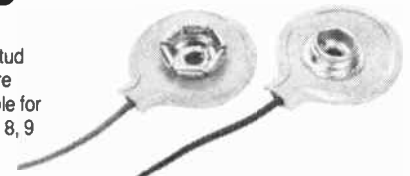
Order

XX09K (AC Adaptor Unregultd)	£4.95
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BATTERY CLIPS

PP9 Type

Standard separate clips, press-stud type. Diameter: 19.1mm. with wire approximately 21cm long. Suitable for use with batteries type PP1, 4, 7, 8, 9 etc.



Order

HF27E (Clips PP9)	24p
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PP3 Type

Dual miniature clip for PP3, 6 etc. Insulated overall with twin wire lead approximately 14cm long.



Order

HF28F (PP3 Clip)	9p
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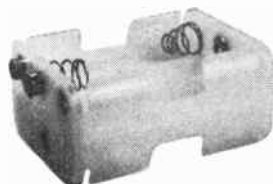
BATTERY HOLDERS

A range of battery holders for HP7(AA), HP11(C) and HP2(D) type cells. The holders are moulded in polythene.

HP11 Batt Box



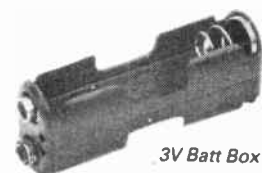
9V Batt Holder



HP2 Batt Box



3V Batt Box



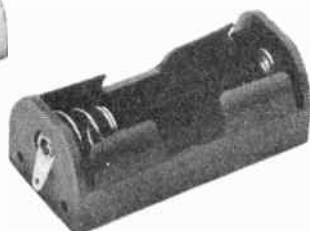
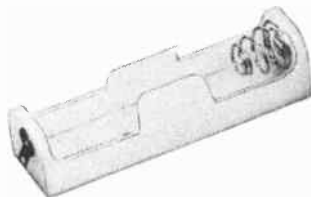
Long HP7 Batt Box



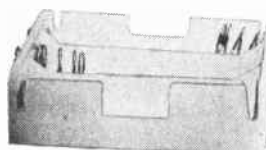
12V NiCad Batry Box



1½V Batt Box

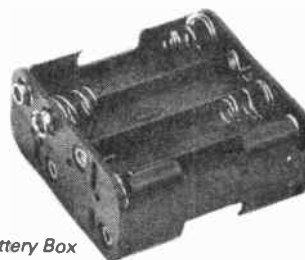


HP11 Single Box

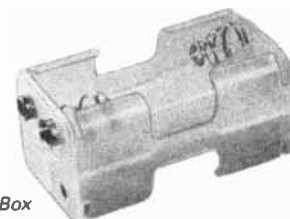


HP2 Single Box

4½V Batt Box



12V Battery Box



6V Batt Box

Cell size	Standard battery type	No. of cells	Standard battery voltage	Ni Cad voltage	Size (mm)	Connector required	Layout	Type
AA	HP7	1	1.5V	1.2V	57x16x14	Solder to tag	—	1½V Batt Box
AA	HP7	2	3V	2.4V	60x27x16	PP3 Clip	Side-by-side	3V Batt Box
AA	HP7	3	4.5V	3.6V	60x47x16	PP3 Clip	Side-by-side	4½V Batt Box
AA	HP7	4	6V	4.8V	60x31x30	PP3 Clip	Side-by-side	6V Batt Box
AA	HP7	4	6V	4.8V	110x26x17	PP3 Clip	2x2	Long HP7 Box
AA	HP7	6	9V	7.2V	62x46x30	PP3 Clip	Side-by-side	9V Batt Hldr
AA	HP7	8	12V	9.6V	58x60x30	PP3 Clip	4x4	12V Batt Box
AA	HP7	10	15V	12V	78x60x32	PP3 Clip	5x5	12V Ni Cad Box
C	HP11	1	1.5V	1.2V	61x28x25	Solder to tag	—	HP11 Single Box
C	HP11	4	6V	4.8V	109x53x24	Solder to tag	2x2	HP11 Batt Box
D	HP2	1	1.5V	1.2V	69x35x27	Solder to tag	—	HP2 Single Box
D	HP2	4	6V	4.8V	251x37x28	Solder to tag	In-line	HP2 Batt Box

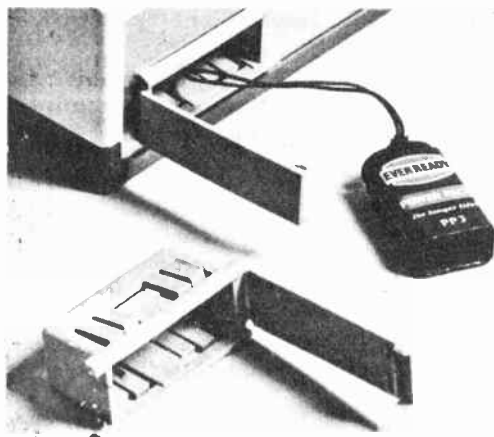
Order

YR59P (1.5V Batt Box)	25p	RK44X (12V Battery Box)	56p
YR60Q (3V Batt Box)	30p	RK45Y (12V NiCad Batry Box)	72p
YR61R (4.5V Batt Box)	35p	BK45Y (HP11 Single Box)	30p
HF29G (6v Batt Box)	38p	HF95D (HP11 Batt Box)	58p
HF94C (Long HP7 Batt Box)	38p	BK46A (HP2 Single Box)	35p
HQ01B (9v Batt Holder)	48p	HF97F (HP2 Batt Box)	85p

PP3 Battery Holder

A clip-in battery holder moulded in grey polypropylene and designed to accept one PP3 9V battery. Will fit panels from 18swg to 10swg and a 58.5 x 24.5mm cut out is required. The cover, moulded as part of the holder, opens easily for battery changing and snaps shut securely. The holder comes complete with PP3 battery-clip and lead.

Overall size 67.5 x 27.5 x 34mm deep. Depth behind front of panel: 29mm.



Versatile Battery Holder

A battery holder in grey polypropylene that will accept two PP3 batteries or four AA cells in a '6V Battery Box' (HF29G).

The holder has a hinged cover which opens easily for battery change and snaps closed securely.

The holder will clip into any panels with a 1.5mm or 3mm gauge or it may be screw fixed (M3) to any thickness panel.

A 45.25mm square cut-out is required in the panel. The battery holder is supplied with two PP3 battery snaps.

Order

HY32K (Large Batt Hldr)	£2.80
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DUMMY BATTERY

A plastic spacer with straight through metal contact for use as a dummy in our AA size battery holders and nickel cadmium battery chargers. The dummy is exactly the same size as an HP7 (AA) size battery.

Order

YX92A (Dummy Battery)	28p
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Order

XX33L (PP3 Battery Holder)	£1.80
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BOOKS

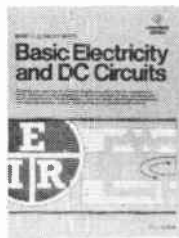
Amateur Radio	54	Dragon Computer	64	Oric Computer	64
Amstrad Books	61	Electrical	43	Programming	59
Apple Computer Books	64	Electronics	43	Projects Books	48
Assembly Language	58	Equivalents	45	QL Computer	65
Atari Computers	62	Hi-Fi Projects	52	Remote Control	50
Audio & Hi-Fi	53	Home Security	50	Robotics	65
BBC Micro Books	60	IC Databooks	46	Servicing	55
Beginners	48	IC Handbooks	47	Software (General)	60
Car Electronics	43	IC Projects	51	Test Gear Books	51
Commodore 64 Computer	63	Loudspeakers	52	Transistor Handbook	45
Computers (General)	57	Microprocessors	56	TV & Video Handbooks	56
Constructor Guides	47	Music	53	VIC20 Computer	65
Data Books	46	Opto-Electronics	52	ZX81 & Spectrum Computer	63

ELECTRICAL BOOKS

Basic Electricity and DC Circuits

by Ralph A. Oliva and Charles W. Dale

A step by step approach for the beginning student. The book covers first concepts and terms, basic mathematics required in the study of basic electricity and direct current circuits. This is a comprehensive text including clearly stated objectives and exercises with answers and is ideal for self-paced individualised learning. American book. 1979. 924 pages. 234 x 184mm, illustrated.



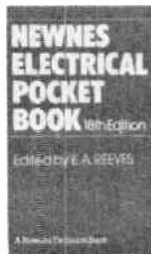
Order

WA27E (Basic Elec & DC Ccts) £10.75NV

Newnes Electrical Pocket Book

Edited by E.A. Reeves, DFH (Hons), C. Eng, MIEE

A thorough guide to electrical engineering practice, which remains an indispensable reference book for the engineer in the field and for all who require handy, concise yet comprehensive information on a wide range of electrical subjects. 1981. 478 pages. 165 x 101mm, illustrated.



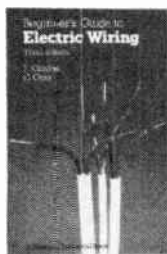
Order

RL27E (Book NB147) £7.95NV

Beginner's Guide to Electric Wiring

by F. Guillou and C. Gray

A practical introduction to the installation of electric wiring in domestic premises, shops and small workshops etc. Explains the latest (15th) I.E.E. wiring regulations and is designed for the layman who wishes to extend or improve his domestic installation, and apprentices in electrical engineering. 1982. 178 pages. 184 x 120mm, illustrated.



Order

RL31J (Book NB157) £4.95NV

Questions and Answers on Electric Wiring

by W. Turner

Up-to-date coverage of the requirements of the I.E.E. regulations for the electrical equipment of buildings. Embraces wiring, installation, control and protection and is of value to electrical apprentices, electricians, electrical contractors etc. 1982. 144 pages. 165 x 110mm, illustrated.



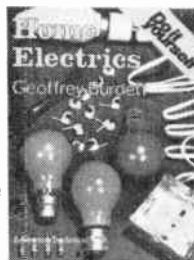
Order

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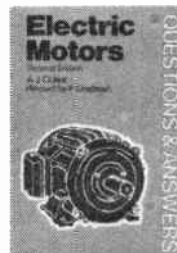
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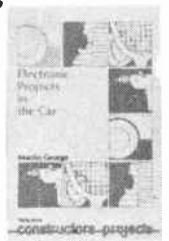
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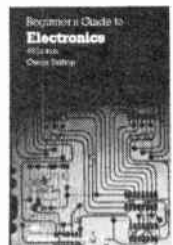
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ELECTRONICS HANDBOOKS

Beginner's Guide to Electronics

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An introduction to electronics which is dealt with non-mathematically with the emphasis on illustrative examples. Contents: Electric currents, direct and alternating currents, electronic components, basic electronic circuits, test instruments etc. 1982. 240 pages 185 x 120mm, illustrated.



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1978, 280 pages, 208 x 132mm, illustrated.

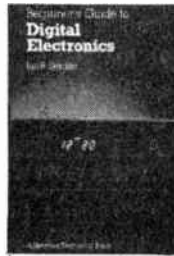
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by I.R. Sinclair

A clear introduction to digital technique progressing from signals and switches through logic gates, clocks, flip-flops and shift registers to displays ending with a complete chapter on microprocessor systems. Although mathematics is kept to a minimum, there is a guide to Boolean algebra.



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Understanding Digital Electronics

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A continuation of 'Understanding Solid-State Electronics', giving an understanding of the electronic circuitry in many types of digital electronics, from the basic idea of a transistor saying 'yes' or 'no', to entire digital systems made up of 1000's of such circuits.



1978. 264 pages. 208 x 132mm, illustrated.

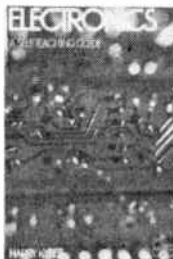
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A self teaching guide that leads you through the basic principles of modern electronics without going into complicated mathematics. The guide shows you how to design your own working circuits. American book.



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by E. A. Parr

The book should be of special value to candidates for the Electronic Servicing certificate of the Radio Trades Examination Board and the City and Guilds of London Institute. 1981. 350 pages. 192 x 126mm, illustrated.



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A comprehensive basic reference text for the fast-changing world of electronics. The book is designed to cover all the electronics content of the revised T.E.C. Certificate and Diploma programmes, fit a wide range of related courses including C.S.E. and 'O' level electronics, suit first year degree courses and those fresh to the world of electronics. It includes a number of large clear diagrams supporting the text, together with photos where necessary. The text follows the pattern of the associated T.E.C. syllabus, but it has been extended to create a comprehensive electronics text.



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This book covers most of the basic theory behind electronics in a readable manner with minimum recourse to mathematics although formulae having a practical bearing are presented with examples to illustrate their applications.



1977. 118 pages. 180 x 108mm, illustrated.

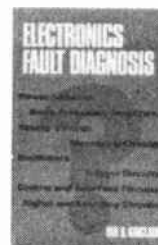
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The operation of numerous typical circuits is discussed along with examples of what can go wrong. In each case the circuit is marked with voltage readings that would be obtained if the circuit were working correctly.



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230 x 150mm, 250 pages, illustrated.

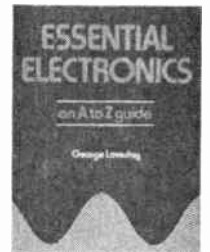
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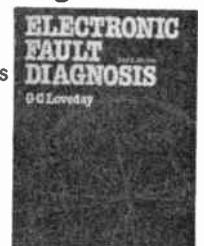
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The ability to rapidly diagnose the causes of faults in electronic equipment and circuits is one of the important skills that can be acquired by the electronics technician. The exercises throughout this book are designed to assist the student in acquiring this ability. The text mainly concentrates on component failure occurring in particular types of circuit. Techniques for localising faults in complete electronic instruments or systems, is covered briefly.



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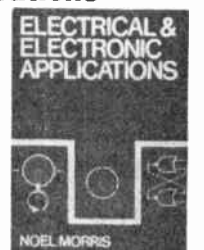
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Electrical and Electronic Applications

by Noel Morris

A book for students containing details of basic AC theory as applied to single and polyphase power generation and electric motors and machines both AC and DC. The book covers semiconductor construction, theory and practice, digital techniques and a brief description of microprocessor operation. The book rounds off with an illustration of various electronic test instruments.



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by Raymond A. Collins

Contains over 1000 different circuits carefully sorted into 60 different categories. A useful sourcebook of ideas mostly taken from IC manufacturers' data books. There is a comprehensive index so that the required circuit can be easily found. American book. 1980, 880 pages, 210 x 130mm, illustrated.



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An easy to understand look at the world of electronic communications. The book gives an overview of the types of systems, the basic concepts of their operation and how they send and receive information. There is an in-depth look at AM/FM radio, TV, telephones, computers and even satellite systems. American book. 1980, 288 pages, 208 x 132mm, illustrated.

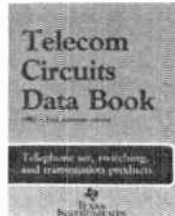


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by George E. Friend, John L. Fike, H. Charles Baker, John C. Bellamy

Data communications – the transmission of words or symbols from a source to a destination – is no longer exclusive to the business world. You can learn the basic principles in this easy-to-understand book, and a whole lot more. Ten chapters cover basic concepts and fundamentals of transmission and reception, asynchronous and synchronous, protocols, error control & networking. Subjects include two wire and coaxial cable communication, waveguides, modems, fibre optics and satellite communication to name a few. 230 x 180mm, 268 pages, illustrated.



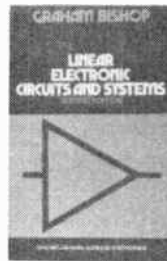
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A comprehensive book of linear circuit theory, from basic AC circuit theory to advanced analog computer circuitry. Transistor construction, operation and circuit design are fully covered. The second edition, which has been revised and updated, now includes FET & IC manufacture plus analogue/digital circuits, etc. 1983, 220 pages, 232 x 152mm, illustrated.



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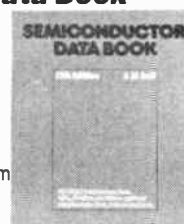
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by Adrian Michaels

Contains a large number of different types of diodes, rectifiers, zeners, LED's, diacs, triacs, thyristors, OC's, photodiodes and display diodes showing possible equivalents from Europe, America and Japan. 1982, 144 pages, 178 x 110mm.



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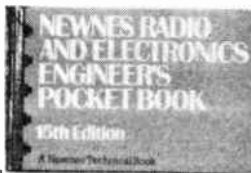
DATA BOOKS

Newnes Radio & Electronics Engineer's Pocket Book

by Editorial Staff ETI

An invaluable compendium of facts, figures and formulae, including common transistor and diode data and pin-outs, TTL and CMOS details,

radio and TV frequencies, metric conversions, wire gauges and much, much more, plus a superb index. 1978. 192 pages. 81 x 125mm, illustrated.



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RL06G (Book NB0740) £4.50NV

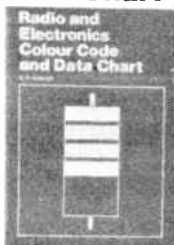
Radio and Electronics Colour Codes and Data Chart

1971. Fold out sheet 584 x 458mm.

Cover size 168 x 114mm.

Order

RH05F (Book BP7) 65pNV



Practical Electronic Calculations & Formulae

by F.A. Wilson

This book aims to bridge the gap between complex technical theory and trial and error practical methods. It is in six sections: units and constants, DC circuits, passive components, AC circuits, networks and measurements. 1981. 250 pages. 180 x 108mm.



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Chart of Radio Electronic Semiconductor and Logic Symbols

by M.H. Babani BSc (Eng)

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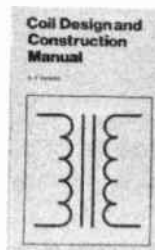
Coil Design and Construction Manual

by B.B. Babani

1960 (Revised 1974). 96 pages. 180 x 108mm, illustrated.

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INTEGRATED CIRCUIT DATA BOOKS

Voltage Regulator Databook

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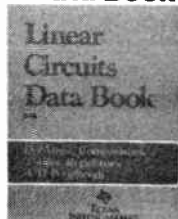


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Full data sheets covering TI's range of op-amps, comparators, timers, video and log amps, voltage level detectors A to D converter components analogue switches and Hall-effect devices. Also covered are TI's zero crossing detector, double balanced mixer, precision level detector, overvoltage sensing circuits. 1984. 416 pages. 232 x 178mm, illustrated.

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WA10L (TI Linear Circuits) £4.00NV



The TTL Data Book

Full data sheets covering TI's very large range of TTL IC's. An interchangeability guide is included. American book. 1984. 1184 pages. 210 x 148mm, illustrated.

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WA14Q (TI TTL Data) £10.95NV



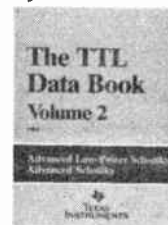
The TTL Data Book, Volume 2

Texas Instruments

Packed with the design data, internal circuit and pin-out diagrams, and dynamic parameters information for some 300 Advanced Low-Power Schottky (ALS) and Advanced Schottky (AS) logic IC's. Included in this volume is a functional index to all types of bipolar digital devices available or under development showing the available technologies for each type, TTL, Schottky, AS, ALS etc. There is also a short explanatory section on logic symbols for new circuit diagrams. 1984. 210 x 150mm, 815 pages, illustrated.

Order

WP31J (TTL Data BOOK) £8.50NV



Digital Integrated Circuit Pocket Guide

A clearly arranged summary of TI's range of TTL IC's with brief data, logic and pin assignments. American book.

1981. 352 pages.

184 x 106mm, illustrated.

Order

WA18U (TI Dig IC Guide) £3.50NV



The Master IC Cookbook

by Clayton L. Hallmark

Contains brief specification and pin-out diagrams for over 350 IC's and includes a description of the function of each IC. The IC's described are mostly standard CMOS 4000 and 74C series and TTL 74 series.

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Full data sheets covering TI's range of 4-bit-slice Schottky processors and μ L micro-computer components. Also included are data sheets for TI's fibre-optic data link controllers, bipolar PROM's, RAM's and FIFO and some support functions.

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WA12N (TI Bipolar Micro) £4.50NV



The 9900 Family Data Book

Full data sheets covering TI's 9900 microprocessors, I/O devices and memory support chips. A benchmark report is included. American book.

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WA15R (TI 9900 Data) £10.00NV



Z80 IC's Data Sheets

Contains full data sheets for the CPU, PIO, DMA and SIO. American book. 1978. 72 pages. 210 x 148mm, illustrated.



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PQ54J (Z80 Data) £2.50NV

The 8080/8085 Microprocessor Book

by Intel

Contains data sheets and applications information on the 8080 and 8085 CPU chips and their support chips. A very comprehensive book containing a wealth of information. Circuits and software are shown to implement complete systems. 1980. 624 pages. 278 x 212mm, illustrated.

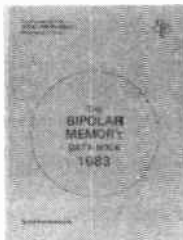


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Full data sheets for TI's range of bipolar PROM's and RAM's, and TI's bipolar FIFO and character generator. A cross-reference guide is included. American book. 1981. 64 pages. 234 x 170mm, illustrated.

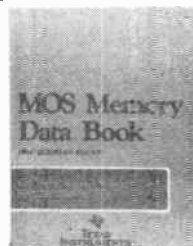


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The MOS Memory Data Book

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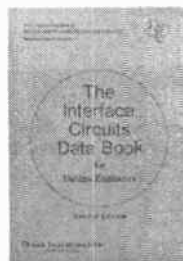


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by T.D. Towers, MBE, MA, BSc, C. Eng, MIERE

Contains over 13,000 American, European, British and Japanese digital ICs with electrical and mechanical specifications quoting manufacturers and available substitutes. The 'Digital IC Selector' is written in the same way as the 'International Transistor Selector' by the same author, and is designed to provide, in one handy reference volume, a comprehensive body of readily accessible, user oriented information across the range of digital ICs. The tables are supported by separate appendices giving additional useful reference information on logic types and coding, package outlines and pin-out diagrams, and a glossary of abbreviations and terminology, etc. 248 x 175mm, 246 pages, illustrated.



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INTEGRATED CIRCUIT HANDBOOKS

How to Identify Unmarked IC's

by K.H. Recorr

The chart shows how to plot the 'signature' of an unmarked IC. This should then enable the IC to be identified with reference to manufacturers' or other data to be used in a specific application, without actually assigning a type number. 1982. Fold-out sheet 640 x 450mm. Cover size 176 x 120mm.



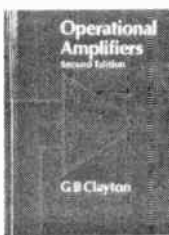
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Operational Amplifiers

by G.B. Clayton, BSc, FlntSP.

Provides an insight into the capabilities of modern operational amplifiers, and also discusses in detail the problems encountered in practical applications. 1978. 416 pages. 216 x 138mm, illustrated.



Order

RR28F (Book NB2028) £13.50NV

How to Use Op-Amps

by E.A. Parr

This designers' guide covering many operational amps serves as a source book of circuits and a reference book for design calculations. The book covers basic circuits, oscillators, audio circuits, filters, power supplies, and a large selection of miscellaneous circuits. There is also a short section of constructional notes and fault finding details. 1982. 160 pages. 176 x 110mm, illustrated.

How to Use Op Amps



Order

WA29G (Book BP88) £2.25NV

A Practical Introduction to Digital IC's

by D.W. Easterling

Besides a number of simple and complex projects, the book contains full construction details of a test set that will enable the reader to identify and test TTL IC's. 1977. 76 pages. 180 x 108mm, illustrated.



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by M.A. Colwell

One of the first things that newcomers to radio and electronics need to come to terms with is the language used. This book aimed primarily at beginners, attempts to break down the barriers which so often deter students from taking up the subject. It takes the reader through the logical steps of building up circuit diagrams from elementary circuit symbols to complex systems. 1976. 112 pages. 216 x 135mm. Illustrated in two colours.



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RR03D (Book NB201) £3.95NV

Electronic Components

by M.A. Colwell

This guide forms an introduction to electronic components, what they are and what they do, and provides guidance on recognition and choice of component for particular applications. It also shows how to recognise faults and prevent failures. 1976. 112 pages. 216 x 135mm. Illustrated in two colours.



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RR27E (Book NB2026) £3.95NV

Printed Circuit Assembly

by M.J. Hughes and M.A. Colwell

This guide takes the mystery out of techniques used in printed circuit assembly and encourages constructors to make their own printed circuit boards. The book describes the characteristics of the various bases used and guides the reader through the stages of translating circuit diagrams into printed circuit layouts. 1976. 96 pages. 216 x 135mm. Illustrated in two colours.



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RR04E (Book NB203) £3.95NV

How to Design Electronic Projects

by R.A. Penfold

An interesting new book which aims to help the reader put together projects from standard circuit building blocks, with the minimum of trial and error and without resorting to advanced mathematics. A series of simple and practical examples are taken, each circuit is analysed and practical designs, including component values, are evolved. A selection of useful circuits are also included. 1983. 102 pages. 178x110mm, illustrated.



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WM67X (Design Electrc Proj) £2.25NV

How to Design and Make Your Own PCB's

by R.A. Penfold

This book should enable you to familiarise yourself with both the simple and more sophisticated methods of producing PCB's. The emphasis is very much on the practical aspects of design and construction, and is highly recommended to all newcomers to electronics. 1983. 66 pages. 177 x 110mm.



Order

WK63T (Make And Design PCBs) £1.95NV

Practical Electronics Handbook

by Ian Sinclair

An excellent handbook for the constructor ranging from resistor colour codes to simple transistor circuit building blocks. An invaluable reference book for everyone from beginners to professional engineers. Covers passive and active discrete components, circuits, linear and digital IC's and TTL and CMOS pinouts. 1980. 186 pages. 216 x 138mm. Illustrated



Order

WG01B (Book NB447) £5.95NV

Introducing Amateur Electronics

by Ian R. Sinclair

This book is designed as an introductory text for anyone wanting to build electronic projects. The book assumes no previous knowledge and teaches the skills of constructing electronic circuits. Details of a number of actual practical experiments are given showing how components work and behave. 1981. 96 pages. 216 x 138mm, illustrated.



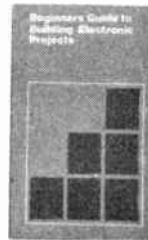
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WG44X (Book AG600) £4.95NV

Beginner's Guide to Building Electronic Projects

by R.A. Penfold

This book will help the complete beginner to tackle the projects in the popular magazines with confidence. Covers component identification, tools, soldering, constructional methods, cases, legends, etc. 1977. 108 pages. 180 x 108mm, illustrated.



Order

RF09K (Book BP227) £1.95NV

How to Get Your Electronic Projects Working

by R.A. Penfold

We have all built circuits from magazines and books only to find that they do not work correctly, or at all, when first switched on. Chapter 1 deals with mechanical faults and describes construction of a tri-state continuity tester. Chapter 2 deals with linear analogue circuits and describes construction of a signal injector. Chapter 3 shows how to check common components with the aid of only a limited amount of test gear. Chapter 4 deals with TTL and CMOS circuits and includes construction details of a pulse generator. 1982. 96 pages. 178 x 110mm, illustrated.



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WA53H (Book BP110) £1.95NV

BOOKS FOR BEGINNERS Electronics - Build and Learn

by R.A. Penfold

The purpose of this book is to help the complete beginner to understand what the main electronic components do and how they are used in practical circuits. The book first describes how to build a 'circuit demonstrator unit' on which the circuits and experiments described later can be set up. Semiconductors, operational amplifiers, oscillators, radio and logic circuits are introduced and fully explained. 1980. 106 pages. 216 x 136mm, illustrated.



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XW53H (Book NB454) £4.35NV

Mastering Electronics

by John Watson

A comprehensive handbook containing all the essential information required to learn and master the principles of electronics. Arranged as a complete self-contained course, for individual or classroom use, it includes basic theory as well as more advanced subjects such as Radio & TV, computers etc. Tested projects are featured to provide the reader with practical experience. This reasonably priced book is recommended for the beginner in electronics. 1983. 382 pages. 215 x 135mm, illustrated.



Order

WM60Q (Mastering Electronic) £3.25NV

Adventures with Micro-Electronics

by Tom Duncan

This superb book is the ideal introduction to electronics as a hobby for children and adults. No soldering is required and you will learn about electronics while building a two-tone doorbell, warbling-wailing siren, two octave electronic organ, pulsed flashing lamp, light operated alarm, electronic dice, traffic lights, pulsed bleeper, four-bit binary counter, reaction timer and a medium wave/long wave radio. The circuits use the very latest CMOS IC's and components may be used over and over again. 1979. 64 pages. 240 x 180mm. Illustrated in two colours.



Order

XW63T (Book JM671) £1.95NV

30 Solderless Breadboard Projects Book 1

by R.A. Penfold

An ideal book for beginners because all the components used are carefully described in a 20 page section at the beginning. The projects can all be built on a Verobloc and wherever possible the components are common to several projects. Thus it is possible, with a small number of relatively inexpensive components, to build in turn every project shown. 1982. 160 pages. 178 x 110, illustrated.



Order

WA51F (Book BP107) £2.45NV

30 Solderless Breadboard Projects Book 2

by R.A. Penfold

As in Book 1 all the projects are built on Verobloc. However, in this book CMOS logic circuits are used where linear IC's were used in Book 1. Absolute beginners must start with Book 1, but this is an ideal follow-on text. 1983. 160 pages. 178 x 110mm, illustrated.



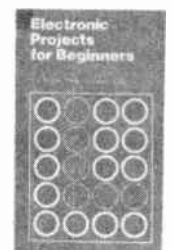
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WA55K (Book BP113) £2.25NV

PROJECTS BOOKS Electronic Projects for Beginners

by F.G. Rayer

Includes a number of projects which can be built without any need for soldering. The book is divided into four sections: 'No Soldering' projects, miscellaneous devices, radio and audio frequency projects and power supplies. Also included are some component & wiring layouts to aid beginners. 1978. 112 pages. 180 x 108mm, illustrated.



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RQ28F (Book BP48) £1.95NV

Popular Electronic Projects

by R.A. Penfold

A selection of the most popular projects, 27 in all, divided into four sections. Radio projects including MW radio, MW/LW radio, short wave converter and receiver, and radio control equipment. Audio projects including pre-amps, 10W power amp, filters and a mixer. Household projects including intercom and metal detector. Test equipment projects including voltmeter, transistor tester and AF signal generator. 1978. 136 pages. 180 x 108mm, illustrated.



Order

RQ29G (Book BP49) £1.95NV

Popular Electronic Circuits Book 1

by R.A. Penfold

Contains 73 projects to build with circuit and short text giving a brief introduction, circuit description and any special notes on construction and setting up. Chapter headings are: audio circuits; project circuits; and miscellaneous circuits. Not suitable for the absolute beginner. 1980. 144 pages. 180 x 108mm, illustrated.



Order

XW67X (Book BP80) £1.95NV

Popular Electronic Circuits Book 2

by R.A. Penfold

A further 73 projects to build covering a wide range of subjects. Chapter headings are: audio circuits, test gear circuits, radio circuits, house and car circuits and miscellaneous circuits. The book is suitable for those capable of building projects from just a circuit diagram, although a description of how it works and any testing or setting up information is given. 1982. 146 pages. 180 x 108mm, illustrated.



Order

WG86T (Book BP98) £2.25NV

Practical Electronic Building Blocks Book 1

by R.A. Penfold

Virtually any circuit will be found to consist of a number of distinct stages when analysed. Some circuits are specialised but in most cases they are built up from building blocks of standard types. This book is designed to aid electronics enthusiasts who like to experiment with circuits and produce their own projects, and gives the circuits for a number of useful building blocks with details of how to change the parameters of each circuit to suit individual requirements where relevant. 1983. 110 pages. 180 x 110mm, illustrated.



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WK51F (Book BP117) £1.95NV

Practical Electronic Building Blocks Book 2

by R.A. Penfold

This is the sequel to Book 1 and follows much the same pattern using different circuits. The two books do not overlap and have been specifically written to complement each other. Book 1 dealing mainly with circuits to generate signals and Book 2 with circuits that process them. 1983. 94 pages. 180 x 110mm, illustrated.



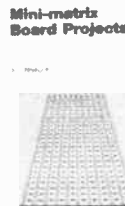
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Mini-Matrix Board Projects

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A selection of twenty useful and interesting circuits any of which can be built on a small Veroboard type 14354 (FL06G). Projects include a MW radio, guitar headphone amp, transistor checker, microphone amp, aerial booster, kitchen timer, baby alarm, touch switch, automatic signal, magnetic lock and 10 more. 1982. 112 pages. 178 x 110mm, illustrated.



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WA35Q (Book BP99) £1.95NV

Multi-Circuit Board Projects

by R.A. Penfold

The book contains 21 electronic projects, any of which may be constructed on the same specially designed pcb. Ready-made pcb's are available from Maplin (GA79L - see Projects Section). Also the same components have been used in each design where possible so that components and pcb may be used over and over again. 1982. 128 pages. 178 x 110mm, illustrated.



Order

WA36P (Book BP103) £1.95NV

50 Projects Using Relays, SCR's and Triacs

by F.G. Rayer

Includes circuits of model train controllers, timers, auto emergency light, alarms, drill speed controller and many more. 1977. 100 pages. 180 x 108mm, illustrated.



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by R.M. Marston

Outlines the essential operating characteristics of the s.c.r. and the triac and presents 110 useful projects in which these devices can be used. The projects range from simple electronic alarms to self-regulating electric heater power controllers. 1972. 138 pages. 216 x 135mm, illustrated.



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RL05F (Book NB074) £5.95NV

Electronic Games

by R.A. Penfold

Circuits for 19 different games including noughts and crosses, combination lock game, electronic roulette, one-armed bandit, snap indicator, electronic die etc. All the projects are inexpensive and easy to construct. 1980. 96 pages. 180 x 108mm, illustrated.



Order

XW37S (Book BP69) £1.75NV

How to Build Your Own Metal and Treasure Locators

by F.G. Rayer, TEng (CEI), Assoc. IERE

Includes principles and construction, details of various coils, detectors and amplifiers. With comprehensive construction details. 1976. 96 pages. 180 x 108mm, illustrated.



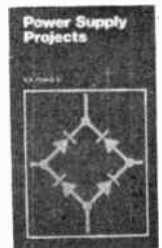
Order

RH25C (Book BP32) £1.95NV

Power Supply Projects

by R.A. Penfold

Gives details of stabilised, un-stabilised, fixed and variable power supplies and explains how to design your own power supplies. There are also circuits for train controller, ni-cad charger, electronic fuse, shaver inverter and others. 1980. 96 pages. 180 x 108mm, illustrated.



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XW52G (Book BP76) £1.95NV

Electronic Household Projects

by R.A. Penfold

Constructional projects include two-tone door buzzer, automatic porch light, electronic thermostat, lamp dimmer, bedside radio, burglar alarm, baby alarm, smoke and gas detectors and many more. 1980. 112 pages. 180 x 108mm, illustrated.



Order

XW44X (Book BP71) £1.75NV

Model Railway Projects

by R.A. Penfold

Contains complete circuit and construction details of a number of different model train controllers and accessories. The accessories include a point controller, automatic signal, signal controller and various sound effects.

1981. 112 pages. 175 x 110mm, illustrated.

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WG60Q (Book BP95) £2.15NV



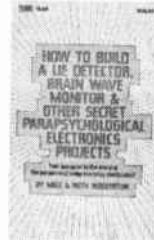
How to Build a Lie Detector, Brain-Wave Monitor & Other Secret Parapsychological Electronic Projects

by Mike and Ruth Wolverton

All of the projects in this unique and unusual book were taken from recent scientific research in the field of parapsychology. Full instructions are given, showing how to build a simple telepathic message receiver and an inexpensive brain-wave monitor. You can build biofeedback projects, control psychokinetic energy, perform electronic dowsing. In addition Kirlean photography is explained and details are given for building a UFO detector and communicator. American book.

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WG94C (Book FT1349) £12.75NV



Electronic Timer Projects

by F.G. Rayer

The book covers many of the applications of timer circuits with some of the more complicated ones made up from a number of simpler circuits which are dealt with individually. The author shows how these may be combined in various ways to make some quite sophisticated projects.

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WG72P (Book BP93) £1.95NV



Electronic Projects in Photography

by R.A. and J.W. Penfold

Fifteen inexpensive and simple to build projects with full construction details, setting-up procedures and components lists for the beginner including flash slave, sound-operated flash, print timer, auto safe-light, thermostat, slide timer etc.

1981. 81 pages. 216 x 135mm, illustrated.

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WG50E (Book NB500) £3.95NV



Telephone Accessories you can Build

by Jules H. Gilder

Includes details of how to build fifteen telephone accessories such as remote ring indicator, speakerphone, scrambler, auto-dialler, telephone burglar alarm, answering machine, phone lock, etc.

American book. 1976. 96 pages. 208 x 132mm, illustrated.

Order

WG18U (Book HD748) £9.85NV



Understanding Telephone Electronics

by J.L. Fike and G.E. Friend

This takes the reader step-by-step from the simplest explanation of telephonic principles through to an intermediate level of telecommunications learning. It covers signalling, switching, digital types, modems & cordless phones. American book.

Order

WK45Y (Undrstn Phone Elctrn) £4.50NV



Electronic Science Projects

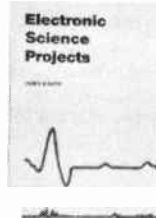
by O. Bishop

A set of interesting projects with a strongly scientific flavour ranging in complexity from a colour temperature meter to an infra-red laser. Other projects include a pH meter, an electro-cardiometer, an oscilloscope with a solid-state display and many more.

1982. 144 pages. 178 x 110mm, illustrated.

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WA49D (Book BP104) £2.25NV



REMOTE CONTROL BOOKS

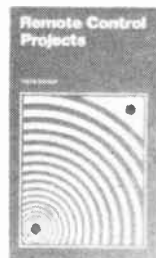
Remote Control Projects

by Owen Bishop

The book contains lots of circuits, designs and applications for remote control projects. Not only are radio control methods covered, but also ultrasonics and infrared. All the circuits are fully explained and therefore easily adapted for your particular application.

Order

XW39N (Book BP73) £2.50NV



Radio Control for Beginners

by F.G. Rayer

Contains constructional details of various types of transmitters and receivers, many with complete board layouts. The construction of a field strength meter is also described, to aid setting-up the transmitters. Full details of what is permissible are given and the book also explains the various electromechanical methods of achieving movement in the model.

1980. 128 pages. 180 x 108mm, illustrated.

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XW66W (Book BP79) £1.75NV



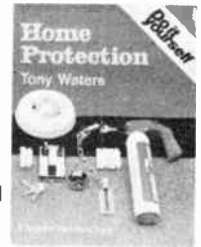
BOOKS ABOUT HOME SECURITY Home Protection

by Tony Waters

The book will help you plan the protection you need, choose from the equipment available and fit it correctly. The book covers intruder deterrents, locks, bolts and electronic alarm systems and also summarises domestic fire risks, heat and smoke detectors and advises what to do in the event of a fire.

Order

WA62S (Book NB769) £4.95NV



Electronic Security Devices

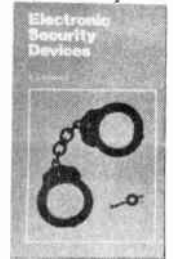
by R.A. Penfold

The book covers switch activated burglar alarms with exit and entry delays, infrared, ultrasonic and Doppler shift systems as well as smoke and gas detectors, water temperature and baby alarms. All the circuits are fairly simple and Veroboard layouts are given.

1979. 102 pages. 180 x 108mm, illustrated.

Order

RL43W (Book BP56) £1.95NV



Electronic Projects for Home Security

by Owen Bishop

With burglaries and house break-ins on the increase, this book comes at an opportune moment for those keen to protect their property. Projects include perimeter detector, alarms, exit door timer, intruder deterrent, infra-red detector, combination sentry, touch alarm etc.

1981. 92 pages. 216 x 135mm, illustrated.

Order

WG54J (Book NB535) £3.95NV



110 Electronic Alarm Projects for the Home Constructor

by R.M. Marston

Includes full circuit details of burglar alarms, car alarms, temperature-operated and light-sensitive alarms, as well as power failure alarms, over-voltage alarms etc. etc. This book is packed with useful circuits.

1977. 112 pages. 216 x 138mm, illustrated.

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RB10L (Book NB269) £5.95NV



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TEST GEAR PROJECTS Electronic Test Equipment Projects

by Alan C. Ainslie

Several interesting projects are covered and full constructional details are given. Projects include millivoltmeter, audio oscillator, frequency meter, RF signal generator, function generator etc.

1981. 88 pages.
216 x 135mm, illustrated.



Order

WG53H (Book NB529) £3.95NV

Electronic Test Equipment Construction

by F.G. Rayer

Contains full constructional details of dozens of useful pieces of test equipment including analogue multimeter, zero current voltage measurement, capacitance bridge, sine wave generator, RF probe, RF multi-band signal generator, transistor tester, FET 'grid' dip oscillator, standing wave indicator and many many more.

1980. 96 pages. 180 x 108mm, illustrated.



Order

XW51F (Book BP75) £1.75NV

How to Build your own Solid State Oscilloscope

by F.G. Rayer

The book describes the construction of a simple oscilloscope assembled from individually constructed and tested modules. The author gives clear and concise practical instructions so that even the inexperienced hobbyist should be able to construct the instrument with the minimum of difficulty and expense.

1979. 96 pages. 180 x 108mm, illustrated.



Order

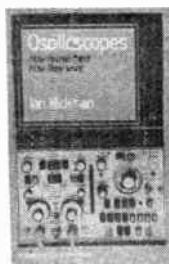
XW07H (Book BP57) £1.95NV

Oscilloscopes: How to use them: How they work

by Ian Hickman

The book describes the functions of the oscilloscope and how to use them. Accessories are described as well as more advanced instruments and special purpose types. The book then explains how oscilloscopes work and ends with a list of manufacturers' names and addresses.

1981. 128 pages. 216 x 135mm, illustrated.



Order

WG34M (Book NB472) £4.95NV

110 Waveform Generator Projects for the Home Constructor

by R.M. Marston

Waveform generators form the basis of many electronic instruments and gadgets, from simple alarms to complex test gear. 110 different types are shown, many with useful applications in the home and at the workbench.

1978. 134 pages.
215 x 137mm, illustrated.



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RQ30H (Book NB353) £5.95NV

INTEGRATED CIRCUIT PROJECTS BOOKS 52 Projects Using IC 741

by R. & U. Redmer

Includes pre-amps, mixer, amplifiers, telephone monitor amp, power supplies, rev counter, guitar pre-amp and many more, interesting projects.

1975. 80 pages.
180 x 108mm, illustrated.



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RH18U (Book BP24) £1.75NV

110 Operational Amplifier Projects for the Home Constructor

by R.M. Marston

Outlines the essential characteristics of the op-amp then using the 741 presents 110 useful projects ranging from single amplifiers to sophisticated instrumentation circuits.

1975. 128 pages.
216 x 135mm, illustrated.



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RL30H (Book NB153) £5.95NV

Modern Op-Amp Projects

by R.A. Penfold

Contains a wide range of projects making use of all the latest types of op-amps including transconductance types. All of the projects are fairly easy to construct and a Veroboard layout is provided for most of them.

1982. 112 pages.
178 x 110mm, illustrated.



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WA50E (Book BP106) £1.95NV

IC 555 Projects

by E.A. Parr, BSc., C.Eng., MIEEE

Describes dozens of circuits using the NE555 timer, including car wiper delay, rev counter, emergency flashers, model railway shuttle service, station stop/start, computer voice, signal generator, police siren, 'Star Trek' siren etc. etc.

1978. 144 pages.
180 x 108mm, illustrated.

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LY04E (Book BP44) £2.50NV

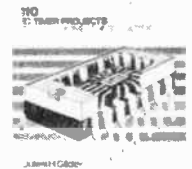


110 IC Timer Projects

by Jules H. Gilder

The book contains 110 circuits using the ever popular NE555 including 9 monostables, 13 astables, 8 logic circuits, 37 test instrument circuits, 20 car circuits, 11 alarm and control circuits and 12 power supplies and converters.

American book.
1980. 124 pages. 228 x 146mm, illustrated.



Order

XW38R (Book NB480) £5.95NV

50 CMOS IC Projects

by R.A. Penfold

Fifty interesting and useful projects divided into four sections: Multivibrators, Amps and Oscillators, Trigger Devices and Special Devices.

1977. 102 pages.
180 x 108mm, illustrated.



Order

RB24B (Book BP224) £1.35NV

Second Book of CMOS IC Projects

by R.A. Penfold

Many simple projects to build including model traffic lights, thermostat, over-voltage cut-out, sound activated switch, door buzzer, basic burglar alarm with entry and exit delays, logic probe, plus over 20 more interesting and useful circuits.

1979. 128 pages. 180 x 108mm, illustrated.



Order

RQ66W (Book BP59) £1.95NV

50 Circuits Using 7400 Series IC's

by R.N. Soar

Fifty simple but useful circuits using eleven of the more common 74 series IC's. Circuits include logic level indicator, low frequency audio oscillator, fuse tester, two bit decoder, twin-tone oscillator, simple signal injector and many more.

1979. 76 pages. 180 x 108mm, illustrated.



Order

RL44X (Book BP58) £1.85NV

OPTO ELECTRONIC BOOKS

50 Simple LED Circuits

by R.N. Soar

Circuits using LED's and Displays. 50 different ones are described. 1977. 64 pages. 180 x 108mm. Illustrated.



Order

RF12N (Book BP42) £1.65NV

50 Simple LED Circuits Book 2

by R.N. Soar

A useful sourcebook of circuits using LED's. Fifty are shown including LED test circuit, battery monitor, flasher, diode and transistor testers, magic boxes and many more. 1981. 64 pages. 180 x 108mm, illustrated.



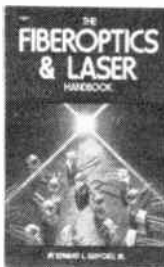
Order

WG43W (Book BP87) £1.45NV

The Fibre Optics and Laser Handbook

by Edward L. Safford, Jr.

Video disk players that use laser beams to 'read' information stored on the disk, laser devices that read bar graph data on food packages, fibre optic sensing devices that can relay information on malfunctioning car parts to a warning indicator on your dashboard. These are just a few of the many ways that lasers and fibre optics are making an impact in today's world. Whether you are simply curious about the subject, an engineer looking for a thorough overview of the latest practical applications or an electronics experimenter who wants some ideas on making your own laser and fibre optic devices, then this is probably the most complete book available on the state of the art! American book. 210 x 130mm, 356 pages, illustrated.



Order

WP00A (Fib Op Laser Handbk) £14.70NV

Counter Driver and Numeral Display Projects

by F.G. Rayer

Various types of numeral display and projects using popular counter and driver IC's are discussed in this book. Circuits are described that count, divide and display. 1980. 96 pages. 180 x 108mm. Illustrated.



Order

XW34M (Book BP67) £1.75NV

The Opto-Electronics Data Book

Full data sheets covering TI's complete range of opto products: photo-detectors, infrared emitters, opto couplers, sensor/emitter arrays, LED's, displays, amplifiers for photo-diodes, optical waveguard transmitter and plastic fibre-optic data links. Data sheets for TI's thermal print heads are also included. An interchangeability guide is included. American book. 1984. 320 pages. 208 x 148mm, illustrated.



Order

WA08J (TI Opto Data) £6.55NV

Projects in Opto Electronics

by R.A. Penfold

Contains dozens of useful and interesting projects using LED's, LDR's, etc. Circuits include automatic fader, audio compressor, lamp dimmer, stopwatch, modulated light transceivers, etc. 1978. 112 pages. 180 x 108mm, illustrated.



Order

LY05F (Book BP45) £2.10NV

Electronic Projects using Solar Cells

by Owen Bishop

Contains a number of projects that benefit from and are capable of being powered by solar cells rather than batteries. 1981. 110 pages. 180 x 108mm, illustrated.



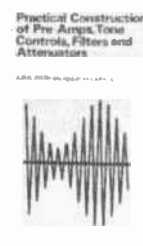
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XW62S (Book BP82) £1.95NV

BOOKS OF HI-FI PROJECTS Practical Construction of Pre-Amps, Tone Controls, Filters and Attenuators

by A.D.M. Smlth

The book gives practical circuits for tape, microphone and disc pre-amplifiers, tone controls, presence unit, high pass, low pass, rumble and scratch filters. A telephone simulation filter is also described. 1979. 112 pages. 180 x 108mm, illustrated.



Order

XW08J (Book BP60) £1.95NV

Audio Projects

by F.G. Rayer

The book covers the construction of a wide range of audio projects including pre-amps, mixers, power amps, tone controls, matching and a range of miscellaneous projects including audio tracer, level meters, sine wave source, dummy load, audio limiter, light modulator, VOX unit etc. 1981. 96 pages. 180 x 108mm, illustrated.



Order

WG46A (Book BP90) £1.95NV

Audio Amplifier Construction

by R.A. Penfold

Circuits of a wide range of preamplifier and power amplifier designs, from low noise microphone & tape head preamps to 100W MOSFET amps, are provided in this book. The projects are relatively easy to construct using the PCB or stripboard designs given. Setting up and testing procedures are described, although in most cases no test gear is required. 1983. 99 pages. 178 x 110mm, illustrated.



Order

WM31J (Audio Amp Constrct) £2.25NV

BOOKS ABOUT LOUDSPEAKERS

First Book of Hi Fi Loudspeaker Enclosures

by B.B. Babani

A comprehensive look at the types of enclosures which can be utilised including over 50 pages of diagrams of enclosures for many sizes of speaker and styles of cabinet. 1974. 96 pages. 180 x 108mm, illustrated.



Order

RH38R (Book BP205) 95pNV

Loudspeaker Enclosure Design and Construction

This booklet contains a broad selection of cabinet designs and enclosures for the chassis loudspeaker units in Maplin's BIG CAT range of loudspeakers and many others. Comprehensive guide-lines are given for tackling construction, stressing important points such as the care needed and details to consider in selecting materials, making joints, sealing, baffle mounting the driver units, wadding the cabinet and paying proper attention to electrical connections to guarantee a worthwhile finished product. Twenty-three designs are described, from small-sized bass reflex cabinets using 12in dia. full range drivers, through folded horns, to monster multi-way high power systems. 1983. 298 x 210mm. 53 pages, illustrated.



Order

WM82D (Spkr Cabinet Designs) £3.00NV

Designing, Building & Testing Your own Loudspeaker System

by D.B. Weems

The book contains many detailed plans for speaker-box construction, for one, two or three-way systems. Simplified design charts are provided so that it is easy to design your own system. Full circuit details of many different types of crossover networks are given and much of the theory is explained, and includes much background theory with useful mathematical formulae. The appendix even includes a speaker design program listing to run on a TRS-80 microcomputer. American book. 1981. 192 pages. 210 x 130mm, illustrated.



Order

WG82D (Book FT1364) £10.30NV

High Performance Loudspeakers

by Martin Colloms

Considerable changes have taken place in the area of high performance loudspeaker design, in particular, recent developments in digitally encoded sound sources, producing a new digital programme standard. New work on the laser analysis of diaphragms, investigation into the stored energy in enclosures, driver developments, and even new discoveries into distortion introduced by defective or over driven crossover components, are included in this third edition. Also included are such recent topics as low mass honeycomb speaker enclosures, electrostatic speaker theory, new diaphragm materials, low distortion magnet systems, computer controlled testing procedures, listening room design, enclosure design. 225 x 145mm hard cover, 318 pages, illustrated.



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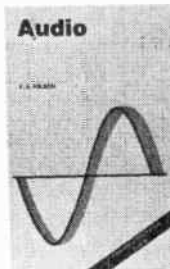
WP21X (Hi Perfmcnce L/Sprks) £14.95NV

AUDIO AND HI-FI BOOKS

Audio

by F.A. Wilson

A very educational and useful reference book for anyone wanting to know more about the behaviour of sound and AF electronics in order to further their understanding of audio amplifiers, loudspeaker systems, electronic music etc. The book begins with an analysis of the sound wave with an explanation of acoustical properties and what they mean, followed by a study of the mechanism of hearing and how we hear various sounds. This logically introduces musical instruments and how they work, the principle of stereophonic sound and the meaning of unwanted 'noise'. This takes the reader on to room acoustics and the essential design requirements of microphones and loudspeaker systems, followed by subsequent sections on amplifiers of various types, descriptions of 'gramophone' disk and magnetic tape recording, and electronic music synthesis. The book finishes with some useful data and formulae. 179 x 110mm, 308 pages, illustrated.



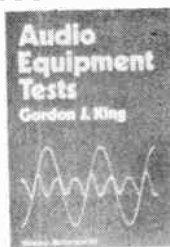
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WP30H (Book BP111) £3.50NV

Audio Equipment Tests

by Gordon J. King

Contains the essential details of more than a hundred proven tests for domestic hi-fi and audio equipment. Each test is carefully described, a list of instruments required is given and the procedure to be followed is explained. Typical results are explained and evaluated. Will help everyone understand what specifications really mean. 1979. 164 pages. 234 x 156mm. Illustrated.



Order

XW26D (Book NB336) £9.95NV

Public Address Handbook

by Vivian Capel

A practical guide for those involved in or wishing to learn about PA with answers to all the common problems that are likely to be encountered. There are also chapters dealing with special techniques for outdoor installations, diagnosing and tracing faults, catering for live music and the provision of auxiliary services. 1981. 216 pages. 214 x 132mm, illustrated.



Order

WG69A (Book AG602) £10.50NV

Microphones in Action

by Vivian Capel

A complete guide to all the different types of microphone available showing the advantages and disadvantages of each. The book explains in what circumstances different types of microphone should be used, how to position them, what effect acoustics and environment will have, how the microphone should be matched and connected up, how hum and noise can be combatted and what accessories are necessary. 1978. 154 pages. 208 x 142mm, illustrated.



Order

XW83E (Book AG512) £5.50NV

ELECTRONIC MUSIC BOOKS

Electronic Music and Creative Tape Recording

by M.K. Berry

The book shows how electronic music can be made at home with the simplest and most inexpensive of equipment. It then describes how the sounds are generated and how they may be recorded to build up the final composition. Circuits are included of VCO's, VCA's, VCF's, envelope shapers, mixers, fuzz and noise generators etc. and a 10-note programmable sequencer. 1978. 86 pages. 180 x 108mm, illustrated.



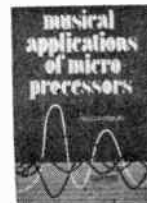
Order

RQ36P (Book BP51) £1.95NV

Musical Applications of Microprocessors

by Hal Chamberlin

A comprehensive book covering methods of music synthesis, voltage control and sound modification as well as computer control and digital synthesis. Most computer and electronic music techniques are covered including some never before published. The book is very readable and both beginners and experienced experimenters in this field will find it invaluable. Highly recommended. American book. 1980. 672 pages. 228 x 150mm, illustrated.



Order

WG40T (Book HD753) £24.15NV

Electronic Synthesiser Projects

by M.K. Berry

Construction details are given of the individual parts of a synthesiser then the book shows how to assemble these to make a complete instrument. Chapter headings are: analogue delay line; single-chip synthesiser; programmable sequencer; voltage controlled oscillator; envelope shaper; and voltage controlled amplifier; putting it all together. 1981. 92 pages. 180 x 108mm, illustrated.



Order

XW68Y (Book BP81) £1.75NV

Electronic Projects in Music

by A.J. Flind

Contains circuits and full construction details of several useful musical projects including guitar and microphone pre-amps, treble and bass boosters, fuzz, waa-waa, and tremolo generators, mini organ and electronic drum etc. Economical designs and clear and easy to follow text and pictures make this an excellent little book. 1979. 88 pages. 216 x 135mm, illustrated in two colours.

Electronic Projects in Music

Order

XW09K (Book NB391) £3.95NV

Electronic Music Projects

by R.A. Penfold

Contains circuits and construction details of many not too complex electronic music projects including fuzz-box, waa-waa pedal, sustain unit, reverberation, phaser unit, tremolo generator and many more. 1980. 112 pages. 180 x 108mm, illustrated.



Order

XW40T (Book BP74) £1.75NV

AMATEUR RADIO BOOKS Beginner's Guide to Amateur Radio

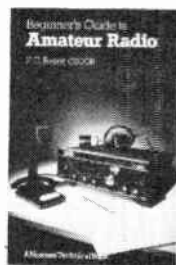
by F.G. Rayer G30GR

Whether you are new to radio or have become interested in CB, you will find here a wealth of information that will help to prepare you for the Radio Amateurs Examination. The book will teach you about radio communication and explains simply, many of the aspects of radio that can be baffling to the newcomer.

1982. 240 pages. 186 x 120mm, illustrated.

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WA90X (Book NB112) £4.95NV



25 Simple Shortwave Broadcast Band Aerials

by E.M. Noll

25 simple shortwave aerial project ideas are covered in this easy to understand, illustrated book.

1984. 68 pages. 178 x 112mm, illustrated.



Order

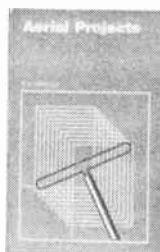
WM33L (25 Aerials Book) £1.95NV

Aerial Projects

by R.A. Pentfold

The book contains various practical aerial designs including active, loop and ferrite aerials which give good performances yet are relatively simple and inexpensive to build. Complex theory and mathematics of aerial design have been avoided. Constructional details are given for a number of aerial accessories including a preselector, attenuator, filters and tuning unit.

1982. 96 pages. 178 x 110mm, illustrated.



Order

WA37S (Book BP105) £1.95NV

Solid State Short Wave Receivers for Beginners

by R.A. Pentfold

Includes several modern solid state short wave receiver circuits that will give a fairly high level of performance using relatively few components.

1976. 92 pages. 180 x 108mm, illustrated.



Order

RB22Y (Book BP222) £1.95NV

How to Build Advanced Short Wave Receivers

by R.A. Pentfold

Includes full construction details of a number of receivers which should have levels of performance at least equal to that of commercially built sets of equal complexity. Also contains Q-Multiplier, S-Meter, Noise Limiter etc.

1977. 118 pages. 180 x 108mm, illustrated.



Order

RB26D (Book BP226) £1.95NV

How to make Walkie-Talkies

by F.G. Rayer

Covers licensing requirements, permitted wavebands, practical circuitry and details of suitable aerials.

1977. 112 pages. 180 x 108mm, illustrated.



Order

RF18U (Book BP43) £1.95NV

Projects in Amateur Radio

by F.G. Rayer G3 0GR

Full construction details are given for several radio projects including short wave converter for medium wave radio, carrier injector for morse and ssb, direct conversion receiver for 80m, converter for 2m etc. The book also includes frequencies and short wave data and details of aerials for long distance reception.

1981. 96 pages. 216 x 135mm, illustrated.



Order

WG52G (Book NB502) £3.95NV

25 Simple Indoor and Window Aerials

by E.M. Noll

For the short-wave listening enthusiast who may be living in a flat or similar accommodation where the use of external aerials is impossible, this book describes how one can install aerials in or around the room, ceiling, windows, attic, etc - twenty-five different permutations are shown in detail. The book also shows how simple variations can be improved for optimum performance. Much information is given on the short-wave bands, aerial directivity, time zones, working dimensions etc.

1984. 178 x 110mm. 70 pages, illustrated.

Order

WM81C (25 Simple Ind Aerial) £1.75NV



25 Simple Tropical and MW Band Aerials

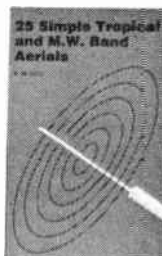
by E.M. Noll

Not about how to construct an aerial that will withstand the climatic rigours of a tropical climate, rather, this book contains details of how to construct antennae for receiving the 60, 75, 90 and 120 metre tropical broadcast bands. The 49 metre band is also included. In addition, information is given for the construction of MW aerials in the 550-1600kHz band. An essential addition to the library of all radio amateurs.

1984. 177 x 110mm. 54 pages, illustrated.

Order

WM93B (25 Simple Trop Aer) £1.75NV



Microcomputers in Amateur Radio

by Joe Kasser G3ZCZ

The book describes how to use a computer as an accessory in an amateur radio station. Interfaces are described and programs are shown. Morse code generation and RTTY software are shown. The book is of interest to any amateur radio operator who wants to tune in to the latest technical innovations. American book.

1981. 308 pages. 208 x 130mm, illustrated.



Order

WG95D (Book FT1305) £10.80NV

How to Tune the Secret Shortwave Spectrum

by H.L. Helms

Have you ever wondered what coded messages used by spies sound like? Or about an echo that comes back from 'nowhere', with a time-lag unexplainable with our present knowledge of propagation and transmitter power? If your curiosity is stirred by the subject of unusual signals then this book is for you. It's a shortwave listener's bible. American book.

1981. 182 pages. 210 x 130mm, illustrated.



Order

WG80B (Book FT1185) £9.80NV

Guide to Broadcasting Stations by Wireless World

The book contains lists both in geographical order and in frequency order of long and medium wave European stations and short wave stations world wide. In addition there is a list of European VHF radio stations and a concise guide to suitable aerials, signal identification and reception reports. New 18th edition. 1980. 236 pages. 185 x 120mm, illustrated.



Order
XW43W (Book NB467) £4.95NV

World Radio TV Handbook

A complete directory of international radio and television with details of every broadcast station in the world, including frequencies, operating times, announcers station identification and signature tune. Also contains articles of interest to listeners to world broadcasts. Annual, current edition supplied. 600 pages in 1985 edition. 224 x 144mm, illustrated.



Order
XW91Y (Book WRTV) £17.95NV

Long Distance TV Reception for the Enthusiast by Roger Bunney

A practical and authoritative introduction to TV DXing including details of many ingenious devices used by active enthusiasts. 1981. 144 pages. 180 x 108mm, illustrated.



Order
RQ33L (Book BP52) £1.95NV

Build a Personal Earth Station for Worldwide Satellite TV Reception by Robert J. Traister

Begins with a review of standard television fundamentals and satellite-to-earth station transmission and reception. Tells how to put a station together using surplus equipment, kits or building from scratch. Gives detailed instructions on installing the aerial and aiming it to pick up the signals you want to receive. American book. 1982. 304 pages. 210 x 130mm, illustrated.



Order
WA61R (Book FT1409) £9.95NV

The Complete Guide to Satellite TV by Martin Clifford

If you've ever tried to find information on TVRO reception; details on siting and installing TVRO base stations; or specifics on satellite orbits, uplinks and downlinks, and decibel calculations, you've probably found that search a frustrating and timeconsuming experience. Now this book provides answers to just about any question you could ask on TVRO's, how signals are processed and the components and installations of your own home system. American book 208 x 130mm, 250 pages, illustrated.



Order
WM99H (Satellite TV Guide) £11.25NV

CB Projects by R.A. Penfold

Full construction details of a number of useful CB projects including a speech processor, interference filters and even a simple CB radio receiver. Where appropriate, setting-up procedures are described in detail, and no special test equipment is necessary to get the finished projects to function properly. 1981. 96 pages. 180 x 108mm, illustrated.



Order
WG73Q (Book BP96) £1.95NV

Beginner's Guide to Radio by Gordon J. King

Surveys the whole field of radio from basic principles of electricity and magnetism, transistors and their circuits, up to radio transmission, stereo broadcasting and reception, and hi-fi reproduction. Instills a basic understanding of how and why radio receivers work. 1977. 240 pages. 186 x 120mm, illustrated.



Order
RH59P (Book NB016) £4.95NV

ELECTRONIC SERVICING Servicing Radio, Hi-Fi and TV Equipment by Gordon J. King

The book deals with servicing domestic electronic equipment with the emphasis on a speedy fault diagnosis. Semiconductor principles and circuitry are described and fault diagnosis in various types of circuits is covered. The book contains much practical advice and is invaluable to the service engineer, students and the hobbyist presented with faulty equipment. 1982. 205 pages. 216 x 138mm, illustrated.



Order
WG89W (Book NB132) £7.95NV

Repairing Pocket Transistor Radios by Ian R. Sinclair

The text outlines the basic principles of a radio, how to identify the major components and how to solder. It shows you how to search for mechanical and electrical faults and how to put them right using only a screwdriver and the radio's own loud-speaker. Construction of a simple signal tracer is shown as well. 1977. 64 pages. 212 x 138mm, illustrated.



Order
XW88V (Book AG569) £3.50NV

Transistor Radio Fault-Finding Chart by C.E. Miller

This excellent chart contains lots of very useful tips and will help you find faults easily on AM transistor radios. 1980. Fold-out sheet 635 x 445mm. Cover size 180 x 120mm.



Order
XW32K (Book BP70) 50pNV

Questions and Answers, Radio Repairs by Les Lawry-Johns

Covers most types of radio set found in the U.K. and explains how to repair them in a practical way without resorting to theory. The author describes from practical experience what goes wrong with radio sets, and describes how to find the fault and how to put it right. 1979. 96 pages. 165 x 111mm, illustrated.



Order
RQ59P (Book NB367) £2.95NV

Electronic Servicing by Rhys Lewis

Part of a series covering the Part II Core Studies syllabus in the City and Guilds Institute Course 224, it could nevertheless be a useful reference book of basic electronic principles. The book follows a logical teaching order, components and devices being described in themselves prior to the presentation of actual circuits. The topics covered are LCR circuits, transformers, semiconductor diodes, transistors and other devices, voltage amplifiers, waveform generation and shaping, the cathode ray tube and power supplies. A minimum of the essential basic mathematics is included, although physical explanations are used throughout. 1983. 142 pages. 232 x 156mm, illustrated.



Order
WM86T (Elect Servicing) £6.95NV

Fault Diagnosis of Digital Systems

by Don L. Cannon

This book helps the reader to understand the workings of digital systems and operation of the components in the system so that he may go on to tackle faultfinding, and the book covers this area in detail. A must for those who are concerned about the welfare and maintenance of their home computer and is also of use to those wanting to take up the servicing of digital systems as a career. 1984. 210 x 147mm. 270 pages, illustrated.



Order

WM88V (Fault Diag Dig Syst) £8.75NV

TV SERVICING BOOKS Newnes Colour Television Servicing Manual Vol. 3

by Gordon J. King

A study of the circuits of nine basic colour TV chassis, covering in depth the normal operation of the sets. Each chapter concludes with detailed servicing notes on decoder alignment, adjustments, fault symptoms and corrections. The book is profusely illustrated with circuit diagrams, chassis layouts, and normal oscilloscope traces. It will prove extremely useful to the apprentice technician and the qualified engineer as well as to the television enthusiast.

Contents: B & O 4000/5000, Bush Z179, CTV1526, Decca 40 series, CS2254/2654, DER 5757, 7C09, 7C10, Ferguson 3722, 3C30, 3C28, Hitachi CSP680, CFP475, CNP860, CS685, CNP865, ITT CVCB, CK720, Marconi 4722, Multibroadcast 7757, Murphy Z179, Philips G9 etc., Radio Rentals 8757, Rank Z179, RR Contracts 1757, Skala 7C09/10, Thorn 9000, 9300, 7C09/10. 1977. 234 pages. 254 x 190mm, illustrated.

Order

RF17T (Book NB240) £13.50NV



Colour Television Servicing

by Gordon J. King

Covers the servicing of PAL receivers with the minimum of mathematics. Includes a fault-finding procedure chart in four colours. Also includes: locating the fault area, servicing procedures, tuned circuit alignment, faulty picture tube symptoms, purity and convergence, timebases E.H.T. and power supplies, vision, chroma, reference generator and sound stages etc. 1975. 348 pages. 254 x 160mm, illustrated.



Order

RL23A (Book NB137) £11.95NV

Practical Repair and Renovation of Colour TV's

by Chas E. Miller

Shows how to obtain a working colour TV for relatively little outlay. Includes CRT tester, Cross Hatch Generator etc. 1976. 80 pages. 180 x 108mm, illustrated.



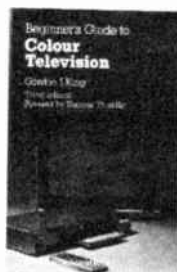
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RH27E (Book BP34) £1.95NV

TV and VIDEO HANDBOOKS Beginner's Guide to Colour Television

by Gordon J. King

Explains how and why colour television works. Includes: historical transmission, colour picture tubes, domestic aerial systems, the PAL receiver, SECAM basics colour receiver and controls. 1984. 198 pages. 185 x 118mm, illustrated.



Order

RL14Q (Book NB101) £4.95NV

Video Techniques

by Gordon White

Written for the non-specialist who wants to learn about general video techniques, for those taking examinations for professional qualifications and also for the practising video engineer or technician who wishes to enlarge his knowledge of other parts of the industry. 1982. 312 pages. 216 x 138mm, illustrated.



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WA95D (Book NB506) £14.25NV

Questions & Answers on Video

by Steve Money

What are VHS, Betamax, V2000 and LVR? How is a television picture displayed? What are SECAM and PAL? How does a video camera work? What are the basic types of video recorder? How is a picture contained in a video disc? These and many more questions are answered clearly and concisely. 1983. 122 pages. 165 x 110mm, illustrated.



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WG77J (Book NB553) £2.95NV

MICROPROCESSOR BOOKS

From Chips to Systems

by Rodney Zaks

A basic text on microprocessors discussing concepts and definitions; how the micro operates, techniques and components needed to implement memory and input/output functions; relative merits of major microprocessor chips; how to assemble the components into a system; applications and how to build for them; interfacing to standard peripherals; and simple programming. American book. 1981. 560 pages. 228 x 176mm, illustrated.



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RQ01B (Book Sybex C201) £17.95NV

A Practical Introduction to Microprocessors

by R.A. Penfold

The purpose of this book is to provide an introduction to the subject which includes a very simple microprocessor circuit which can be constructed so that the reader can experiment and gain practical experience. 1983. 90 pages. 180 x 112mm, illustrated.



Order

WM32K (Micro Introduction) £1.95NV

Practical Microprocessor Systems

by Ian R. Sinclair

The book provides a description of how a microprocessor is connected to its supporting chips and how programs are written and developed for such units. The author deals with hardware, software and firmware through a rudimentary 'build-it-yourself' assessment unit which will help the reader grasp the practicalities involved in microprocessor system design. 1981. 144 pages. 217 x 136mm, illustrated.



Order

WG78K (Book NB496) £6.95NV

The 8086 Primer

by Stephen P. Morse

Written by the man who actually designed the architecture of the 8086 microprocessor, the book describes the 8086 in detail. The fundamentals of designing an 8086-based computer are described along with various methods of programming. American book. 1980. 216 pages. 228 x 152mm, illustrated.



Order

WG24B (Book HD165) £18.65NV

How to Build your own Working 16-Bit Microcomputer

by Ken Tracton

Everything you will need to know to use the T1 TMS9900 single chip 16-bit processor. The book shows you how to build up to a computer that possesses time sharing and a variety of languages, with interfaces to floppy disc, cassette tape and a host of different terminals. American book. 1979. 96 pages. 208 x 128mm, illustrated.



Order

XW15R (Book HD813) £4.95NV

Digital Interfacing with an Analogue World

by Joseph J. Carr

The book tells you how to convert energy produced by pressure, force, position, temperature etc. into a form your microcomputer can deal with. Designed for the micro user who wants to use his machine to measure certain conditions or to control external devices. American book. 1978. 406 pages. 208 x 130mm, illustrated.



Order

XW98G (Book FT1070) £12.75NV

Microprocessor Interfacing Techniques

by Austin Lesea and Rodney Zaks

The book presents a complete set of techniques to interface a microprocessor to the external world. The book will show you how to interconnect a complete system and interface it to all the usual peripherals. Covers 8080, Z80, 6800, and 8085. Includes circuits for a microprocessor controlled music synthesiser. American book. 1979. 456 pages. 216 x 138mm, illustrated.



Order

RQ02C (Book Sybex C207) £15.95NV

Interfacing to Microprocessors and Microcomputers

by Owen Bishop

Consists of a series of practical projects for the home constructor by which a micro system may be linked to the world around it. The theory and circuit of each interface is fully explained, full construction details, strip-board layouts, component lists and hints on alignment and trouble-shooting are given. Also included are flow charts and suggestions for methods of programming the system to operate with the interface. 1982. 147 pages. 216 x 135mm, illustrated.



Order

WA92A (Book NB129) £6.95NV

Simple Interfacing Projects

by Owen Bishop

This book contains a variety of interfacing projects, ranging from the relatively simple which a beginner can build, to those requiring more experience of construction. It includes a voice-operated controller, a sound processor a realtime clock, music generator and digitiser projects. Full constructional details, hints on testing and troubleshooting, programming notes, component listings, and a circuit or logic diagram are given. 1983. 163 pages. 234 x 156mm, illustrated.



Order

WK29G (Simple Interface Bk) £6.95NV

Micro Interfacing Circuits - Book 1

by R.A. Penfold

It is now perfectly feasible for the average amateur electronics enthusiast to build reasonably simple add-ons for a microcomputer, and transform it into a versatile and sophisticated piece of equipment for measurement or control. This book will help those who, although having some previous knowledge of electronics, are unfamiliar with 'interfacing jargon'. It describes the basic principles of interfacing circuits to microprocessor equipment, but not just in a purely theoretical manner. The circuits are all practical ones using real devices. Subjects covered include address decoding parallel and serial interfacing. A to D and D to A converters etc. 1984. 178 x 110mm. 98 pages, illustrated.



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WM79L (Micro I/Face Ccts) £2.25NV

Micro Interfacing Circuits - Book 2

by R.A. Penfold

Following on from 'Micro Interfacing Circuits Book 1', above, Book 2 deals with practical applications beyond parallel or serial interfacing to the microprocessor. It is about 'real world' interfacing and includes such topics as speech and sound generators, temperature and optical sensors, motor control etc. As with Book 1 practical circuits using real devices are provided with circuit descriptions and any relevant background information, such that anyone with a reasonable knowledge of electronics should be able to use or adapt the provided circuits for their own particular applications. 178 x 110mm, 90 pages, illustrated.



Order

WP12N (Micro I/F Ccts - Bk2) £2.25NV

Advanced 6502 Interfacing

by John M. Holland

For anyone interested in robotics and computer control, here is a collection of design techniques and actual circuits that can be used or adapted to virtually any situation. Thoroughly covered are input and output port design, serial communications, timing and timers, A/D and D/A conversion, data acquisition and closed loop control. Though offering advanced solutions to some rather complex and perplexing problems, it is written in an easy-to-understand manner, with clear explanations of circuit applications and operation for those looking for new ideas. American book. 1982. 192 pages. 216 x 134mm, illustrated.



Order

WA41U (Advanced 6502 I/Face) £12.95NV

Data Converters

by G.B. Clayton

The book enables the reader to gain thorough understanding of digital to analogue and analogue to digital converters. Principles of operation are explained in detail and considerations involved in connecting these devices to microprocessors are examined. Procedures for implementing practical applications are shown and the book shows how to interpret data sheet specifications. An excellent text on this important new area in electronics. 1982. 242 pages. 234 x 156mm, illustrated.



Order

WA02C (Book MM495) £8.95NV

GENERAL COMPUTER BOOKS

Disc Drives for Microcomputers

by M. Browne

A useful guide to the operation and programming of disc drives, showing how they affect the type of programs that can be written. The book includes a detailed explanation of the 'Index Sequential Access Method' (ISAM) and shows how to create an ISAM for your computer. Also included is a full explanation of record and file design. Many examples are given to demonstrate the technical points. 1983. 162 pages. 215 x 135mm, illustrated.



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Get More from The Epson Printer

by Susan Curran

Buying a printer is a big step for any home computer owner, and of all the different types now available, the Epson range is dominating the market for inexpensive dot matrix printers. They are popular choices for use with practically any home, educational or small business computer. This book shows you how to get the best from your Epson, with many practical programming examples given for obtaining different type styles, defining new characters for use in special applications, printing out screen images and much more. Written in a clear, simple style, the book assumes some previous experience and knowledge of writing in BASIC. 234 x 153mm, 166 pages, illustrated.



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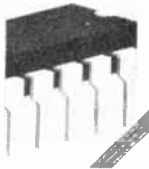
ASSEMBLY AND MACHINE LANGUAGE PROGRAMMING BOOKS

An Introduction to 6502 Machine Code

by R.A. & J.W. Penfold

The 6502 microprocessor is used in many popular home computers including the Electron, BBC models A and B, VIC-20, ORIC-1/Atmos and Atari models. This book illustrates how to use machine code programming with such machines, which enables a vast increase in running speed, instead of using a built-in high-level computer language such as BASIC. The programming does become somewhat more complex, however, although it is not as difficult as might be supposed. The book includes some simple demonstration programs which can be run on any of the aforementioned computers. 1984. 177 x 110mm. 108 pages, illustrated.

An Introduction to 6502 Machine Code

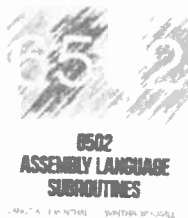


Order
WM92A (Intro 6502 Mach Cde) £1.95NV

6502 Assembly Language Subroutines

by Lance A. Leventhal & Winthrop Saville

This book will help you learn 6502 assembly language quickly. It provides code for more than 40 common subroutines, including code conversion, string processing array manipulation, bit manipulation, I/O and interrupts. The book tells you how to add instructions and addressing modes. You can use the routines shown to speed up a BASIC program and much more. American book. 1982. 550 pages. 234 x 186mm, illustrated.



Order
WA05F (6502 Assembly Subs) £19.95NV

Programming the 6502

by Rodney Zaks

A complete text on how to program in machine language using the 6502. The complete instruction set is explained in detail and then addressing and I/O techniques are discussed. Many examples. Fourth edition. 1983. 408 pages. 216 x 140mm, illustrated.



Order
XW80B (Book C202) £13.95NV

6502 Applications Book

by Rodney Zaks

Shows how to build a complete home alarm system including fire detection, an electronic piano, a motor-speed regulator, a time-of-day clock, a simulated traffic control system and a morse code generator using mainly a SYM1 microprocessor board. Full program listings in machine code are given and a 6502 assembler in Basic is included. American book. 1979. 288 pages. 216 x 140mm, illustrated.



Order
XW81C (Book D302) £7.95NV

6800 Assembly Language Programming

by Lance A. Leventhal

Comprehensive coverage of the 6800 microprocessor assembly language. Each 6800 instruction is fully explained and there is a complete instruction set reference table. The book is full of useful sample programs with source code and object code listings. Details are also given of I/O devices and interfacing methods. American book. 1978. 480 pages. 203 x 132mm, illustrated.



Order
XW70M (Book M3) £17.50NV

The 6809 Companion

by M. James

Written for the average assembly language programmer, this is not a beginners book. The TRS80 colour computer uses the 6809 and it is becoming a very popular microprocessor since it was designed specifically with ease of programming in mind. The book covers all aspects: registers, addressing modes, instruction set, interrupt handling, programming style and converting 6800 programs. 1982. 96 pages. 180 x 108mm, illustrated.



Order
WG88V (Book BP102) £1.95NV

Programming the 6809

by Rodney Zaks and William Labiak

This book covers the 6809 inside and out. You will learn how signals are handled within the chip itself and how to get them to control all essential I/O functions. Whether you are a first time or experienced programmer, this book will make it possible for you to use the 6809 to its fullest capacity. 1983. 362 pages. 227 x 151mm, illustrated.



Order
WK30H (Programming 6809) £14.50NV

68000 Assembly Language Programming

by G. Kane, D. Hawkins and L. Leventhal

This book provides the information you need to tap the full potential of the most powerful microprocessor yet: the 68000, with its highly-evolved architecture and impressive resources. Each of the 68000's instructions is fully explained and there is a wealth of practical programming examples. Assembler conventions, I/O device programming and interfacing methods are also included. American book. 1981. 624 pages. 234 x 164mm, illustrated.



Order
WA04E (68000 Assembly Prog) £19.95NV

Programming the M68000

by Tim King & Brian Knight

This comprehensive guide explains how to program the M68000, which is one of the most advanced microprocessors available at the present time. It is written in a clear and readable manner and provides a wealth of information. The basic M68000 architecture is introduced and then each instruction is explained. Many practical programs are given and readers are encouraged to write effective programs. A complete small monitor program which will handle input & output, test programs etc. is also included. 1983. 235x156mm. 154 pages, illustrated.



Order
WM76H (Programming M68000) £9.95NV

8080/8085 Assembly Language Programming

by Lance A. Leventhal

Comprehensive coverage of the 8080A/8085 microprocessor assembly language. Each 8080A/8085 instruction is fully explained and there is a complete instruction set reference table. The book is full of useful sample programs with source code and object listings. Details are also given of I/O devices and interfacing methods. American book. 1978. 448 pages. 230 x 170mm, illustrated.



Order
XW69A (Book M2) £19.95NV

A Z80 Workshop Manual

by E.A. Parr, B.Sc., C.Eng., M.I.E.E.

The book details the Z80 instruction set and assembly language programming is discussed with examples. Hardware details of the Z80 and associated I/O devices are given. Z80 hex machine code and assembler instructions are given in tabular form along with I/O connections for the various devices discussed.

1983. 160 pages.
178 x 110mm, illustrated.



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WA54J (Book BP112) £2.75NV

Z80 Assembly Language Programming

by Lance A. Leventhal

Comprehensive coverage of the Z80 microprocessor assembly language. Each Z80 instruction is fully explained and there is a complete instruction set reference table. The book is full of useful sample programs with source code and object code listings. Details are also given of I/O devices and interfacing methods. American book.

1979. 660 pages.
230 x 170mm, illustrated.



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XW71N (Book M4) £19.95NV

Programming the Z80

by Rodney Zaks

A thorough introduction to machine language programming from basic concepts to advanced data structures and techniques. With detailed examples and numerous programs, the reader will gain not only an understanding of programming in the Z80 language, but also a detailed understanding of the way a microprocessor actually executes instructions. American book.

1980. 626 pages. 216 x 140mm, illustrated.



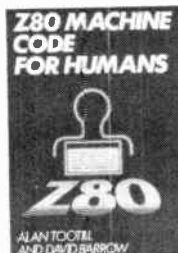
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Whatever your interest — games, business programs, control of machinery or models — machine code will help you achieve the speed, efficiency and certainty of timing to match your needs. This book is designed to be the human interface book offering short understandable routines that can be used in building up some interesting and imaginative applications.

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WK81C (Z80 Machine Code) £7.95NV

An Introduction to Z80 Machine Code

by R.A. & J.W. Penfold

Machine code programming is a means whereby the user can get to grips directly with the microprocessor using the binary numbers which the computer actually handles. This negates using a built-in high-level language such as BASIC, wherein instructions have of necessity a number of options which use up memory and time. Machine Code can be very much faster since only the function you want is the one that is executed; such operands can easily be only a few machine cycles long. To use Machine Code effectively you have to become familiar with the microprocessor's architecture, its Instruction Set, use of The Stack, data storage etc, and be reasonably conversant with the hexadecimal binary numbering system. This book shows you how with the Z80 or faster Z80A, as used in many popular home computers such as the Sinclair ZX Spectrum and Z81, the Memotech MTX500 and MTX512, and the Amstrad CP464. Some simple demonstration programs are included.

178 x 111mm, 136 pages, illustrated.



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BOOKS TEACHING BASIC and PASCAL in Parallel

by S.J. Wainwright

This book takes the two languages and develops programs in both simultaneously. Emphasis is placed on structured programming by the systematic use of control structures, and modular program design is used throughout. Example programs are used to illustrate the program structures as they are introduced, and the reader can learn by example. As the title suggests the book is intended as a bilingual introduction to programming which can be used to learn both languages simultaneously, and to learn programming techniques which are compatible with both languages.

1983. 60 pages. 180 x 110mm, illustrated.



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WK53H (Book BP126) £1.50NV

BASIC and FORTH in Parallel

by S.J. Wainwright

Forth is a very different language from Basic, but this book takes both languages and investigates how things are done in each of them. Basic is used as a familiar 'handle' with which to grasp the various programming techniques. A Forth-Stack simulator program is included which runs on a 16K or 48K Spectrum computer. The Stack is central to the operation of Forth and an understanding of the Stack is fundamental to the Forth programmer.

178 x 110mm, 85 pages, illustrated.



Order

WM95D (BASIC & FORTH) £1.95NV

BASIC and FORTRAN in Parallel

by S.J. Wainwright & A. Grant

A novel book which can be used to learn FORTRAN or BASIC, or both! FORTRAN has occupied an important position in high level programming, for scientific applications, for many years; it is therefore a very useful language to learn. BASIC needs no introduction — this book covers the two languages, at a very reasonable price. An appendix includes a FORTRAN interpreter written in Sinclair Spectrum BASIC, which supports most of the common features of the language and makes it possible to 'get the feel' of writing FORTRAN programs.

1983. 178 x 110mm. 79 pages, illustrated.



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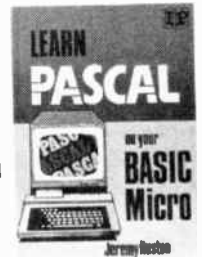
WM66W (Basic/Fortran) £1.95NV

Learn PASCAL on Your BASIC Micro

by Jeremy Rushton

An introduction to Pascal, that includes a compiler written in BASIC so that Pascal techniques can be tried on your BASIC computer. The book contains many example programs and most important Pascal statements are described.

1983. 84 pages.
210 x 150mm, illustrated.



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Discover FORTH

by Thom Hogan

A computer language of building blocks that is optimised for speed and requires little computer support. The author explains the history and uses of FORTH and provides a tightly structured synthesis of material from programming manuals, independent programmers and the FORTH interest group. Whether you are a beginner or serious FORTH programmer this book is a useful reference. American book.

1982. 158 pages. 234 x 166mm, illustrated.



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WA68Y (Discover FORTH) £19.95NV

Exploring FORTH

by Owen Bishop

FORTH is ten times as fast and four times as compact as BASIC. This introductory book explains simply and clearly how you can use FORTH, with many practical examples, on different micros.

1984. 178 pages.
232 x 156mm, illustrated.



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WK98G (Exploring Forth) £6.95NV

Writing Interactive Compilers and Interpreters

by P.J. Brown (University of Kent)

This practical book covers planning and performing the task of implementing an interactive language as well as describing the theoretical concepts. Readers will require a knowledge of programming and interactive systems, but the book is otherwise simple and very readable.



1985. 265 pages. 236 x 166mm, illustrated.

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SPECIALISED SOFTWARE BOOKS

The CP/M Handbook

by Rodney Zaks

For beginners, the book offers step-by-step instructions for using CP/M, whilst for the experienced programmer there are comprehensive descriptions of all CP/M facilities and resources including advanced operations. The book discusses all versions of CP/M up to 2.2 and includes MP/M and CDOS. American book. 1980. 336 pages. 214 x 136mm, illustrated.



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XW79L (Book C300) £13.95NV

Working with dBASE II

by M. de Pace

This book provides a complete guide to the powerful and flexible dBase II software. It will enable new users to set up a comprehensive information processing system: for experienced users it sets out more sophisticated methods – showing how to gain greater control of, and get more value from, data bases. Methods of setting up screen menus, writing enquiry facilities, producing documents such as invoices, and other personal and business processing requirements are also covered. 1984. 233 x 155mm. 172 pages, illustrated.



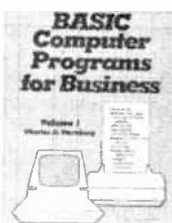
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BASIC Computer Programs in Science and Engineering

by Jules H. Gilder

Complete listing in BASIC with sample run and brief description of general maths, engineering maths, complex maths, matrix maths data analysis, basic electricity, basic electronics, computer-aided circuit design, active filter design, communications passive filters and attenuators. American book. 1980. 256 pages. 246 x 178mm, illustrated.



Order

XW60Q (Book HD762) £17.55NV

BOOKS ABOUT THE BBC MICRO

The BBC Micro – An Expert Guide

by Mike James

A practical introduction to the advanced features of the BBC Micro, covering both hardware and software. The book gives a connoisseur's guide to BBC BASIC and an introduction to the machine operating system. Graphics, sound generation and interfacing are all covered, and two chapters are devoted to assembly language programming.



1983. 160 pages. 234 x 153mm, illustrated.

Order

WK04E (BBC Micro Book) £6.95NV

Discovering BBC Micro Machine Code

by A. P. Stephenson

You can unlock your micro's latent powers with machine code, generate fast-moving graphics, make more effective use of peripherals and ancillary equipment, save precious memory and get to know your machine better. This book will show you how to get started, using many short programs and routines.



1983. 148 pages. 234 x 155mm, illustrated.

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WK56L (BBC Machine Code Bk) £6.95NV

Assembly Language Programming on the BBC

Learn to write in assembly language on your BBC Micro and speed up the execution of your programs – great for moving graphics and controlling external devices. Programming in assembly language brings you into direct contact with the basic building blocks of your micro. It allows much faster running of your programs and much more efficient use of the memory space. This book offers advice for the user, with many practical examples to try.



1983. 235 x 155mm. 305 pages, illustrated.

Order

WK65V (BBC Assembly Lang.) £7.95NV

Advanced Machine Code Techniques for the BBC Micro

by A.P. Stephenson & D.J. Stephenson

This book for advanced readers gives a much more detailed treatment of the machine with many useful examples for you to try. 1984. 260 pages. 232 x 156mm, illustrated.



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WK88V (Machine Code BBC) £7.95NV

Putting your BBC Micro to Work

by Chris Callender

A series of 15 programs designed for home and office use. Titles include; Home Accounts, Telephone Directory, Wordscreen, Stock Control, etc. The programs in this book will allow you to use your BBC Micro in a wide variety of ways.

1983. 111 pages.

210 x 145mm, illustrated.



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WM44X (Putting BBC To Work) £4.95NV

Advanced Programming Techniques for the BBC Micro

by J. McGregor & A. Watt

This book describes clearly and systematically the principles and techniques behind arcade games and character animation, data structures and data bases, text processing, board games, and finally, the beginnings of artificial intelligence. At every stage the reader is encouraged to develop programs based on the material provided.



1983. 376 pages. 235 x 155mm, illustrated.

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DIY Robotics & Sensors with the BBC Computer

by John Billingsley

An interesting introduction to Robotics and its application to the BBC Computer. By using practical projects to construct many gadgets, from a joystick to a robot and explaining the software required for interfacing; the author provides an excellent grounding in the principles of digital and analogue input and output.



1983. 119 pages. 235 x 155mm, illustrated.

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WM53H (DIY Robotics BBC) £6.95NV

Interfacing Projects for the BBC Micro

by Bruce Smith

This book explains clearly, in non-technical language, the hardware and software required to build a variety of devices connected to, and controlled by, the BBC micro. Full details of circuit diagrams, Veroboard layouts, construction and component lists are included; plus the tested programs required to run the projects. The projects include: a burglar alarm, a rain detector, a light pen, an EPROM programmer, an X-Y plotter and a joystick controller. 1983. 235 x 158mm. 134 pages, illustrated.



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WM74R (Interface Proj BBC) £6.95NV

BBC Hardware Projects

by Don Thomasson

This book will enable you to add a whole new world of electronic projects to your BBC micro. Included are projects to build a Light Pen, a switched Joystick Adaptor, a Thermometer, a Graphic Voltmeter, a Computer Oscilloscope, a Hexadecimal Keypad, and many more. This book also contains an in depth explanation of the BBC's hardware operation which is backed up with circuit diagrams and a detailed run down on how each component functions. 210 x 140mm, 184 pages, illustrated.



Order

WP01B (BBC Hardware Proj) £8.95NV

The BBC Micro Add-On Guide

by Allan & Mike Scott, & Philip Gardner

The BBC is probably the most expandable micro on the market, and this book explains for the benefit of non-technical BBC owners what to look for in the way of joysticks, speech synthesizers, light pens, graphics pads, modems, extra memory, disk drives, etc. It describes what they do, how they work and most importantly how to incorporate them into your programs. Contains all the information you need to set up a tailor made system for your particular needs. 235 x 152mm, 140 pages, illustrated.



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WP18U (BBC Add-ons Guide) £6.95NV

BBC Micro Wargaming

by Owen & Audrey Bishop

For BBC micro users looking for new and interesting games to play, and who are new to wargaming, or for experienced wargamers who would like to introduce the computer to the wargaming table. This book describes the principles of wargaming, providing modular routines that you can use directly, or adapt to suit yourself. There are also several complete programs which will also run on the Acorn Electron. The scenarios provided include battles from the popular Medieval, Napoleonic and World War II periods, including a futuristic Space War. 235 x 153mm, 230 pages, illustrated.



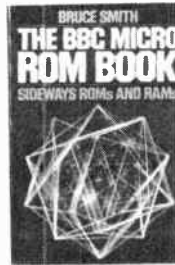
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WP27E (BBC Micro Wargaming) £8.95NV

The BBC Micro ROM Book

by Bruce Smith

The use of ROM-based software is a feature almost unique to the BBC micro, and this book shows how the paged ROM system, and ROM filing system work, providing programming examples to help readers produce their own sideways ROMs using EPROMs, and sideways RAMs. A large amount of available page ROM associated hardware, such as ROM boards, sideways ROM and EPROM programmers, and ROM based software – including 'toolkits', monitors and utilities – are examined in detail. 235 x 152mm, 280 pages, illustrated.



Order

WP23A (BBC Micro ROM Book) £9.95NV

BOOKS ABOUT THE AMSTRAD CPC464

An Introduction to Programming the Amstrad CPC464

by R.A. & J.W. Penfold

The excellent hardware of the Amstrad CPC464 running with Locomotive Basic go to make up an extremely potent and versatile machine and this book has been written to help the reader expand the potential of this powerful combination. The book contains details on Variables and Arrays, Decision making, Graphic modes, Animation, Interfacing, Interrupts and much more. 178 x 110mm. 125 pages, illustrated.



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WM97F (Intro Prog Amstrad) £2.25NV

How to Write Amstrad CPC464 Games Programs

by W. Smister

A step-by-step guide to help you write your own graphics games programs on the Amstrad CPC464. By working through each program in the order given in this book it is hoped that within a fairly short time you will acquire a better understanding of Locomotive BASIC, and how to logically plan your own programs. It is recommended that this book be studied while actually sitting at the computer, so that you can readily SAVE all that you enter immediately onto tape. 178 x 110mm, 136 pages, illustrated.



Order

WP20W (Write Amstrad Games) £2.50NV

The Working Amstrad

by David Lawrence & Simon Lane

A collection of practical subroutines and programs, all clearly explained and written in easily identifiable sections in such a way that it is possible for the methods described to be easily copied into your own programs. Areas covered include home finance and tax, information storage and retrieval, household and diary management, creative graphics and effective display techniques, music, education and a collection of smaller programs which explore the possibilities of the Amstrad as a time machine. The Amstrad is breaking new ground among the home micros, and this book shows how the full power of the Amstrad can be released through its powerful new BASIC. 235 x 154mm, 216 pages, illustrated.



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WP14Q (The Working Amstrad) £5.95NV

Ins and Outs of the Amstrad

by Don Thomasson

Although there is a rapidly expanding variety of books relating to software for the Amstrad CPC464 now available, hardware considerations have been somewhat overlooked. This book explores some of the important features of the CPC464, one of which is the ease with which all major software functions can be accessed by simple calls to the operating system, meaning that the maximum use can be made of the computer, whether you are a first time user or an experienced programmer. In particular a comprehensive description of how to add external devices through the use of the expansion and printer ports is given, and anyone wanting to get more involved in hardware for the Amstrad will find this book indispensable. 210 x 140mm, 126 pages, illustrated.



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Practical Programs for the Amstrad CPC464

by Owen & Audrey Bishop

Fourteen useful and practical programs for the CPC464 are outlined including an accounting program for the home or small business, stock taking, spreadsheet cashflow program, alphabetical indexing, and sound generation. Full instructions and suggested applications are provided so that you can adapt the programs for your use. The book is a good starting point for gaining experience in writing programs for the Amstrad.

235 x 154mm, illustrated.

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WP15R (Prc Prog for Amstrad) £6.95NV



Adventure Games for the Amstrad CPC464

by A.J. Bradbury

Create your very own adventure games using the powerful Locomotive BASIC. Whether you are an experienced programmer or a complete novice, you will find all the information needed to prepare, map and program complete adventures, using the modular routines and listings supplied. References to professional techniques are made throughout, and it is possible with practice that the user will eventually be able to write his own truly remarkable adventures.

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WP17T (Advtr Games Amstrad) £7.95NV



Games for the Atari

by S. Roberts

The book contains a BASIC listing for eight games and a machine code listing for one large game, Gunfight. The book also provides hints and tips for programming your own games. Screen movements are covered along with overlap detection, programming the joystick, sound features and ANTIC. The GTIA display list interrupts and character set redefinition are also described. American book.

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WA47B (Games For The Atari) £5.95NV



Filing Systems and Databases for the Amstrad CPC464

by A.P. Stephenson & D.J. Stephenson

Entirely devoted to the storage, manipulation and retrieval of data, using the built in cassette tape unit, this book shows how to construct both general purpose and specialised filing systems using cassettes. BASIC sorting and searching techniques are described in detail; complete listings and sub-routines are given and written in modular form so that users should find it easy to tailor them to suit their own individual needs. Alternative fast machine code sorting routines are also provided with full directions for splicing them into main programs.

234 x 153mm, 184 pages, illustrated.

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WP22Y (Filing Database Amstrad) £8.95NV



Dynamic Games for the Amstrad

by Clive Gifford

Contains fifty games programs, specifically created for the Amstrad, making the most of the computer's colour and sound capabilities. Games include arcade action style games, gambling, board games, and adventures. This book serves as an introduction to writing programs for the Amstrad as well as playing the games themselves.

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WP16S (Dymnc Games Amstrad) £5.95NV



BOOKS ABOUT ATARI COMPUTERS

Easy Programming for the Atari Micros

by Eric Deason

Ideal for new Atari owners and 'apprentice' programmers, this book contains over 60 programs fully listed complete and ready to RUN. The book is very detailed, and includes ideas at the end of each chapter for do-it-yourself projects. A number of appendices contain such valuable information as the Atari character set, BASIC keywords, hints on debugging and PEEKing the Atari memory map.

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WP13P (Easy Prog Atari Micr) £6.95NV



The Amstrad CPC-464 Advanced User Guide

by Mark Harrison

The book assumes that you have got your 464 running, and you have had some experience writing simple programs for the Amstrad. Even so, it begins with a description of how the 464 works and how it communicates with other external devices, together with a brief summary of BASIC. A comprehensive reference section is included offering an explanation of any BASIC command or keyword. The book contains forty complete programs ready-to-run, ranging from the short demonstration type through to large, complex programs for code breaking, databases, sorting, and graphics. The book is divided into sections dealing with strings and characters, Input Output, arithmetic operations, memory mapping, time, clocks and interrupts, data processing and structures, graphics and sound.

219 x 149mm, 140 pages, illustrated.

Order

WP32K (Amstrad User Guide) £6.95NV



Exploring Adventures on the Atari 48K

by Peter Gerrard

A thoroughly comprehensive guide to writing your own adventure games in BASIC, and assumes only a limited knowledge of the language. Everything you need to know is explained, from creating maps to introducing random elements. Three complete adventure games are listed also. The book provides clear instructions on producing high quality games with minimum effort.

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WP19V (Expngl Advntrs Atari) £6.95NV



The Atari 600XL Program Book

by Peter Goode

The Atari 600XL offers more potential for games programming, in colour, than other micro's on the market - the collection of programs in this book is designed to show off these capabilities. Included are Arcade style games, adventures, puzzles & games of chance, and various utility and control programs.

Order

WM71N (Atari 600XL Prog Bk) £5.95NV



The Atari Book of Games

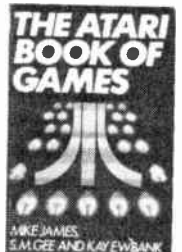
by Mike James, S.M. Gee & Kay Ewbank

A book of 21 games for the Atari, in full colour and with sound. Virtually all the games feature moving graphics and most are designed to exploit the Atari's exceptional graphics and speed. Each game is written in BASIC, with an explanation of how it works, and details of how to personalise it - or change it as your skill improves.

1983. 156 pages. 235 x 155mm, illustrated.

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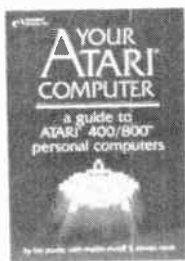
WM38R (Atari Book Of Games) £5.95NV



Your Atari Computer

by Lon Poole with
Martin McNiff & Stephen Cook

Here's an invaluable all-in-one guide for Atari 400/800 computer users. The authors provide complete operating instructions and troubleshooting tips on hardware, peripherals and compatible software. Two chapters are devoted solely to the superb Atari graphics capabilities. For beginners there is a tutorial in Atari BASIC plus instructions for use of colour and sound. The book has a comprehensive reference of BASIC statements and functions. American book. 1982. 464 pages. 234 x 164mm, illustrated.



Order
WA40T (Your Atari Computer) £17.50NV

The Working Commodore 64

by David Lawrence

This is based on a collection of solid, sophisticated programs in areas such as data storage, finance, graphics, household management, education and games of skill. The programs have been designed to make the most of the CBM 64's special features. Some of the programs are a word processor and text editor, a music and sound synthesiser, a sprite editor, and one which allows the user to enter hi-res graphics mode. This is not available in the standard BASIC. 1983. 158 pages. 234 x 156mm, illustrated.



Order
WK46A (The Working CBM 64) £5.95NV

Commodore 64 Machine Code Master

by David Lawrence & Mark England

This two part book opens up a new world for those interested in machine code programming on the Commodore 64. Part 1 provides a full listing and explanation of the Commodore 64 'master code assembler' — a sophisticated program. Part 2 contains a collection of tested machine code routines which extend the standard Commodore BASIC with more than a dozen commands. 1983. 192 pages. 234 x 154mm, illustrated.



Order
WM18U (Commodore Code Book) £6.95NV

The Master Memory Map for the Commodore 64

by Paul Pavelko & Tim Kelly

A clear and concise American book which gives a complete guide to memory locations of the Commodore 64. For the beginner there are many programming examples, including music creation, sound generation and graphics. For the advanced programmer this book will form a powerful reference manual. 1983. 228 x 153mm. 186 pages, illustrated.



Order
WM75S (Mstr Mem Map CBM64) £14.55NV

Secrets of the Commodore 64

by P. Cornes & A. Cross

A beginners guide to the Commodore 64, which contains masses of useful information and programming tips. It also describes how to get the best from the sound and graphics modes. The book is divided into 10 chapters, dealing with such subjects as Character and Sprite Graphics, Sound, Machine Code etc. This handy little guide will complement the Commodore 64 Users Manual. 1984. 178 x 110mm. 109 pages, illustrated.



Order
WM70M (Secrets Comm 64) £1.95NV

ZX SPECTRUM BOOKS

Spectrum Micronet Book

by Alan Giles

This book provides a wealth of detail about using a Spectrum computer to access the pages of MICRO-NET and PRESTEL. Information is given on the PRISM VTX5000 interface and how to use it to convert the computer into a PRESTEL terminal and thereby gain access to the quarter of a million pages that are currently available. Also included is a set of suggestions to improve the BASIC control program of the VTX5000. 210 x 140mm, 85 pages, illustrated.



Order
WP02C (Spectrum Micronet) £5.95NV

Spectrum Machine Language for the Absolute Beginner

Edited by William Tang

If you are frustrated by the limitations of BASIC and want to write faster, more powerful, space-saving programs, then this is the book for you. Even with no previous experience of computer languages, you will be able to discover the ease and power of the Spectrum's own language. Each chapter includes specific examples which can be used on your Spectrum, as well as a self-test questionnaire. At the end of the book this is all brought together into an entire machine language program — from design right through to the complete listing of an exciting, original arcade game. 1983. 244 pages. 210 x 139mm, illustrated.



Order
WK40T (Spectrum Bgnners M/C) £5.95NV

Spectrum Interfacing & Projects

by Graham Bishop

A book of interfacing projects for the Sinclair Spectrum Computer, describes how with the addition of simple circuit boards that will plug into the expansion socket, the ZX Spectrum can be used as a sophisticated 'control computer'. Described in detail are three major expansion boards, enabling you to build an analogue to digital converter, digital to analogue converter and a latch board. Also a Spectrum expansion interface is described, along with programming techniques allowing you to make use of it. Many other projects to build are included; joysticks, voice recording, light pen and position servos for example. Maplin supply three PCB's or complete kits for the three major projects in this book. See Projects Section for details. 1984. 228 x 152mm. 140 pages, illustrated.



Order
WM52G (Spect.Intfcng + Proj) £6.95NV

An Introduction to Programming the Atari 600/800XL

by R.A. and J.W. Penfold

Learning to program in BASIC might at first appear to be a daunting task, but it can be made much easier if tackled in a sensible way. This book takes the reader, step by step, from the fundamentals of BASIC, on to more advanced topics such as animated graphics, allowing the reader to exploit the Atari's exceptional graphics and sound capabilities. Although it is impossible to cover every aspect of a micro as versatile as the Atari fully, the authors have attempted to complement the manufacturers' information rather than just copy it. Hopefully readers will be able to write their own programs and progress onto more advanced programming. Chapters include variables and arrays, strings and codes, INPUT, PRINT and DATA, sound generator, animation etc. 1984. 178 x 110mm. 116 pages, illustrated.



Order
WM80B (Intro Prog Atari XL) £1.95NV

COMMODORE 64 BOOKS

Commodore 64 Computing

by Ian Sinclair

This is an introductory guide and reference book for all CBM 64 users, and is essential for getting the best out of this machine. It covers the setting up and operation of the micro and its many facilities in detail. BASIC syntax is comprehensively summarised with examples, and the book sets out and fully explains the features which make this computer such remarkable value for both business and domestic users — such as graphics, sprites, programmable function keys, colour commands, programming for sound, using the 64K option, CP/M and running programs written for PET machines. 1983. 134 pages. 232 x 155mm, illustrated.



Order
WK47B (CBM 64 Computing) £5.95NV

The Complete Spectrum ROM Disassembly

by Dr. Ian Logan & Dr. Frank O'Hara

Every routine in the ROM has full comments on what its function is and how it relates to the other functions in the ROM. Overall, the 16K ROM program offers an extremely wide range of BASIC functions and commands, and this book makes all the functions and entry points available for use in your own programs or for modifications into special routines.



1983. 232 pages. 214 x 141mm, illustrated.

Order
WM57M (Spectrum ROM Disassembly) £9.95NV

Easy Add-On Spectrum, ZX81, & Ace Projects

by Owen Bishop

The book describes how to build a number of projects for use with Spectrum, ZX81 or Jupiter Ace computers. All the projects are fairly simple and inexpensive; included are, a pulse detector, picture digitiser, 5-key pad, magnetic catch, light pen, photo-flash, lap sensor & more.



1983. 182 pages. 180 x 110mm, illustrated.

Order

WM67X (Add On Projects) £2.75NV

ZX Spectrum Astronomy

by Maurice Gavin

A book aimed at Spectrum owners who wish to expand their computing knowledge to include astronomy. All aspects of the subject are introduced, including star charts, star systems, tracking the orbit of a planet, satellites etc, plus much more. High quality graphics can be achieved, to display such things as the simulated movement of stars.

ZX spectrum astronomy



1984. 234 x 153mm. 229 pages, illustrated.

Order

WM84F (Spectrum Astronomy) £6.95NV

Master Your ZX Microdrive

by Andrew Pennel

This book contains all the information you will need to use the ZX Microdrive to the full. It is clearly explained with many examples, and is equally suited to the relative newcomer or the experienced programmer. As well as the Microdrive, two other features of the ZX Interface 1 are explained — the RS232 port and networking. A program that adds easy to use commands for the Microdrive is included, plus a full explanation of how to add your own commands.

master your zx microdrive



1983. 135 pages. 235 x 155mm, illustrated.

Order

WM40T (Master ZX Microdrive) £6.95NV

Introducing Spectrum Machine Code

by Ian Sinclair

A wide range of extra facilities — plus high speed — become available by programming directly in machine code. This book shows the user what to do in easy stages, step by step.



1983. 154 pages. 232 x 156mm, illustrated.

Order

WM04E (Intro Spec Machine) £7.95NV

20 Simple Projects for the ZX81

by Stephen Adams

Turn your computer into a thermometer, voltmeter, burglar alarm etc. all costing a lot less than individual specialised units. Programs are shown where necessary, but they are kept simple so that they and the projects can be used with virtually any personal computer.



1982. 104 pages. 210 x 149mm, illustrated.

Order

WA80B (20 ZX81 Projects) £6.45NV

Mastering Machine Code on your ZX81

by Toni Baker

This book is designed for those who know BASIC, but haven't much idea about machine code. The author takes those who know absolutely nothing about machine code through from the true basics to the point where they would have a real knowledge of how to do it.



1981. 185 pages. 210 x 149mm, illustrated.

Order

WA82D (ZX81 Machine Code) £7.50NV

BOOKS ABOUT OTHER COMPUTERS

Apple II Users Guide

by Lon Poole

A carefully organised guide for the Apple II, that will enable it's full power to be utilised. This book will help you to program in two versions of BASIC using sound, colour and graphics; it contains information on the disc drive and printer and describes how to use the machine language monitor and high resolution graphics with integer BASIC. There are also tips on advanced programming topics plus a detailed description of every BASIC statement, command and function. American book.



1981. 400 pages. 235 x 165mm, illustrated.

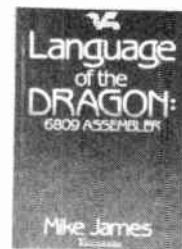
Order

WG41U (Book M46) £19.95NV

Language of the Dragon: 6809 Assembler

by Mike James

A step-by-step guide through every detail of assembly language programming concepts with the 6809 micro-processor (as used in the Dragon), leading to the techniques needed to write professional programs. Thus enabling the reader to obtain exciting visual effects and high speed program operation with his Dragon.



1984. 215 x 146mm. 233 pages, illustrated.

Order

WM73Q (Lang of Dragon 6809) £6.95NV

Oric and Atmos Machine Code

by Ian Sinclair

Most users feel the need to get to grips with machine code after a while, not only because of the advantages of greater speed and versatility but also because it enables them to get to know their machine. This book is essential for Oric owners who take their computing seriously and want to get the maximum performance from their machine. Many illustrative programs are provided throughout.



1984. 148 pages. 232 x 156mm, illustrated.

Order

WM36P (Oric Atmos Mach Cde) £6.95NV

Easy Add-on Projects for Commodore 64, VIC-20, BBC Micro and Acorn Electron

by Owen Bishop

This book describes how to build a number of useful add-on electronic circuits which can be used with the Commodore 64, VIC-20, BBC Micro or the Acorn Electron — but if the reader is using the BBC Micro Model A then a user port upgrade and, for one of the projects, the analogue upgrade too will be required.

Easy Add-on Projects for Commodore 64, VIC-20, BBC Micro & Acorn Electron



All the projects are simple and easy to build, having a minimum component count and utilise inexpensive ICs. Once built the add-ons are easy to use, and sample programs are provided to help those less experienced at programming to get started, but the projects are not limited to this and the more experienced programmer can have a lot of fun writing elaborate programs which use any of the projects.

After an introductory section, each project is described in detail in following sections and include a picture digitiser, model controller, pulse detector, lamp flasher, light pen, photo-flash, rain detector, thermometer and many more. A special decoder circuit is described which is required to enable all the add-ons to be interfaced easily.

176 x 110mm, 194 pages, illustrated.

Order

WP29G (Book BP134) £2.95NV

An Introduction to Programming the Sinclair QL

by R.A. & J.W. Penfold

In order to complement the information supplied by the manufacture rather than just duplicate it, the authors have adopted a step-by-step approach, starting with the fundamentals and then moving on to more advanced topics, with many example programs being included to illustrate and clarify points. This book covers Variables and Arrays, String Variables, Sound Generator, Graphics, QL Interfaces and more.

178 x 110mm, 100 pages, illustrated.

Order
WM94C (Intro Prog Sincl QL) £1.95NV



Vic Revealed

by Nick Hampshire

This book goes deep within the VIC20 to show you its most innermost secrets. Each chip within the VIC is analysed and its function described. For those interested in electronics, comprehensive circuit diagrams are also given. A detailed memory map points out useful memory locations. Entry points to various VIC KERNAL routines are also given. Useful programs enabling you to produce your own high resolution graphics and sound on the VIC are also included.

1982. 272 pages. 232 x 156mm, illustrated.

Order
WA32K (VIC Revealed) £9.95NV



Android Design

by Martin Bradley Weinstein

This highly practical book covers designing main mechanical and motor drives, problems of stairways, the battery, collision avoidance, fingers, vision, verbal literacy, mapping, the atlas and probability shells and brains. A very readable and informative book. American book.

1981. 256 pages. 226 x 146mm, illustrated.

Order
WG61R (Book HD192) £17.55NV



Assembly Language Programming on the Sinclair QL

by Andrew Pennell

Many useful and explanatory machine code listings are given in this book along with relevant BASIC procedures and functions, including a full disassembler. The most important features of QDOS are revealed along with how best to use them in your own programs. The internal structure and register set is explained and many addressing modes clearly detailed. In fact, this book explains all you need to know about programming the 68008 and in addition it shows how to use the hardware and software facilities of the QL, including the 8G49 second processor.

232 x 153mm, 168 pages, illustrated.

Order
WP05G (Assembly Language QL) £7.95NV



An Introduction to Simulation Techniques on the Sinclair QL

by John Cochrane

You too can make your computer think it's a dog, fly a Jumbo Jet in your living room, find out what the Stock Exchange is going to do tomorrow, or anything else that takes your fancy with the aid of computer simulation. The author is an experienced consultant engineer and an expert in computer simulations. He shows how you can make the most of the considerable potential of the Sinclair QL, working within its limitations as far as simulation is concerned. The book takes the reader logically through the world of computer simulations, building up knowledge of the techniques used by the professionals to produce useful programs to create working electronic models which may, for example, be used to solve a practical problem.

1984. 235 x 155mm. 125 pages, illustrated.

Order
WM87U (Intro Sim Sinclair) £6.95NV



ROBOTICS BOOKS

How to Build your own Self-Programming Robot

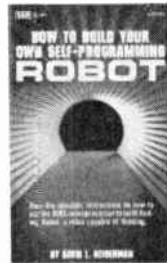
by David L. Heiserman

The book describes the construction of Rodney Robot, a unique little creature that can pick up signals and stimuli from his environment and develop perceptions just like humans do. Rodney is self-programming, so no two are exactly alike, yet he is fully trainable and his 'personality' can be altered and moulded by human intervention. American book.

1979. 238 pages. 210 x 130mm, illustrated.

Order

XW73Q (Book FT1241) £9.88NV



How to Design and Build your own Custom Robot

by David L. Heiserman

All the procedures for planning, putting together and programming a custom designed artificial intelligence machine are here in this detail-packed guide. Electrical and mechanical subsystems including driving and steering mechanisms are fully covered. There are lots of electronic circuits and working plans for three microprocessor systems are given along with flowcharts and listings for 8080A, 8085 and Z80 mnemonics. American book.

1981. 462 pages. 208 x 130mm, illustrated.

Order

WG92A (Book FT1341) £12.75NV



The Robot Book

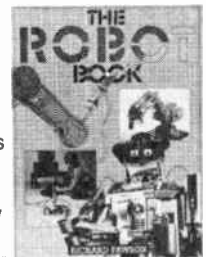
by Richard Pawson

A very comprehensive study in not only the basics of robots but also something of their history and development. It is an ideal beginner's guide to the entire field of robotics, and it will appeal to anyone interested in the new technology, but who do not necessarily wish to build their own robot – but for those who do, full step-by-step instructions for more than a dozen robots you can build yourself, and control from a home computer, are provided.

192 pages. 280 x 210mm, illustrated in full colour.

Order

WP34M (The Robot Book) £7.95NV



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BOXES

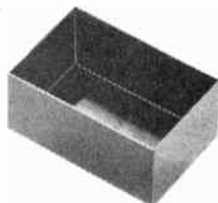
Accessories 71
Cloth 73

Foot Switches 68
Metal Boxes 69

PSU Boxes 68
Wall Box 70

PLASTIC BOXES Potting Boxes

A range of potting boxes for use with our potting compound. Boxes are moulded in black ABS.



Internal dimensions (mm)

Type	Length	Width	Height
Miniature	28	18	14
Small	38	33	19
Large	73	48	34

Wall thickness is 1mm. Length and width are a fraction less at base of box as sides taper slightly. Dimensions shown are measured at top of box.

Order

LH56L (Potting Box Min)	12p
LH57M (Potting Box Small)	18p
LH59P (Potting Box Large)	24p

Small Plastic Boxes



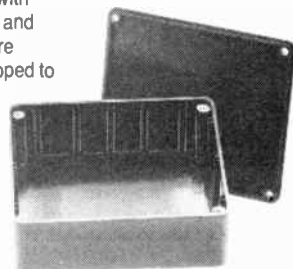
Small plastic box available in black or white. Size: 114 x 76 x 38mm.

Order

LF01B (Box PB1 White)	£1.25
LH14Q (Box PB1 Black)	£1.25

MB Plastic Boxes

A range of glossy finish black plastic boxes moulded in ABS with brass inserts. Lid and screws to fix lid are supplied. Lid is lipped to ensure a good fit. Insides of all except MB1 are grooved on all walls to accept pcb's etc.



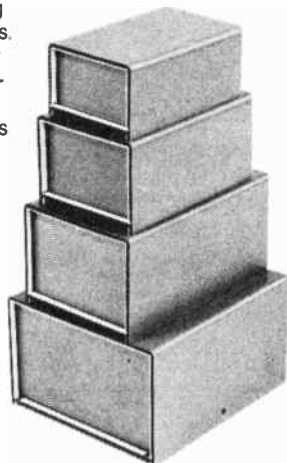
Type	Internal(mm)	External(mm)
MB1	76 x 56 x 35	80 x 61 x 41
MB2	95 x 71 x 35	100 x 76 x 41
MB3	115 x 95 x 37	119 x 99 x 44
MB4	210 x 125 x 77	215 x 130 x 85

Order

LH20W (ABS Box MB1)	£1.25
LH21X (ABS Box MB2)	£1.35
LH22Y (ABS Box MB3)	£1.65
LH23A (ABS Box MB4)	£3.35

Snap-together Plastic Boxes

A range of boxes in which the end and top snap together, with no other fixings. The exterior is silver grey and the interior is white, with the two end plates reversible giving choice of colours. Available in four sizes. All dimensions given are internal. All sizes are in mm.

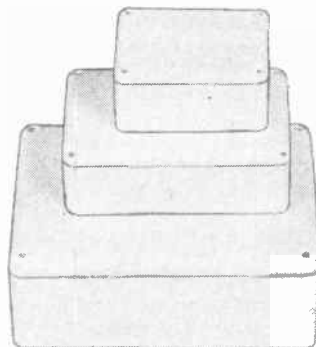


Type	Length	Width	Height
B1	80	50	30
B2	90	60	40
B3	110	70	50
B4	100	100	60

Order

YK48C (Snap Box B1)	£1.25
YK49D (Snap Box B2)	£1.45
YK50E (Snap Box B3)	£1.85
YK51F (Snap Box B4)	£1.95

Small Mountable Boxes



A group of three small boxes having the distinctive feature of being provided with two holes in the base, whereby the boxes may be attached or mounted to a wall or panel. The holes are countersunk from the inside. The boxes are white in colour and have removable lids with chamfered edges retained by four screws.

Dimensions (mm)

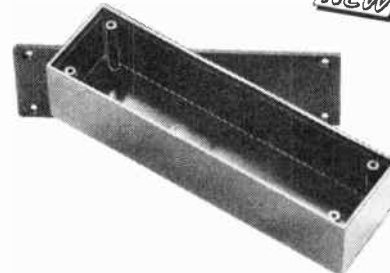
Type	Length	Width	Depth
1521	50	37	24
321	75	50	25
3415	102	76	38

Order

FK72P (Box 1521)	38p
FK73Q (Box 321)	68p
FK74R (Box 3415)	£1.10

Small Narrow Box

NEW

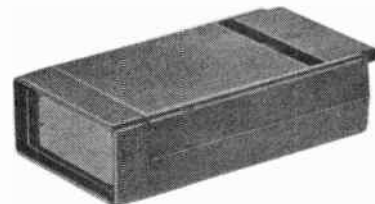


A plain version of the new case for the Logic Probe Project, this small box conveniently fills the gap between matchbox sized plastic cases and the more 'conventionally' sized hand-held boxes where the latter may be too unwieldy for certain uses. The moulded black plastic box is 124mm long by 29mm wide by 29mm deep. It has a removable lid which fits into a lipped recess to form a good seal, and is secured with four self tapping screws, supplied. Ideal for small, hand-held probes, miniature circuits or even as a housing for the protection of a block of screw terminals serving as a junction box for a number of cables etc.

Order

FT31J (Small Narrow Box)	88p
--------------------------	-----

Small Remote Control Box



A small, flat box with a smart recessed panel and surround at one end, readily suitable as a hand-held transmitter/ sender as part of a remote control system. The box includes a battery compartment with removable slide-on lid, particularly suitable for PP3 etc. The box is split in two halves using a tongue and groove type joint, secured by two screws. The 'front panel' surround is removable as a unit, allowing access to the plastic panel itself, which is then free to allow hole-cutting for ultrasonic/infrared transmitting devices, cables etc. The box is 119mm long x 67mm wide x 32.5mm deep. Front panel area is 62 x 27mm. The box is moulded in matt black finish plastic. Two fixing screws supplied.

Order

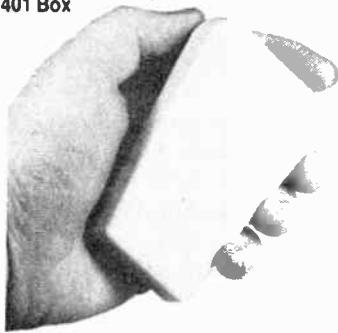
LH90X (Small Remote Control Box)	£2.95
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PHONE NOW
0702 552911



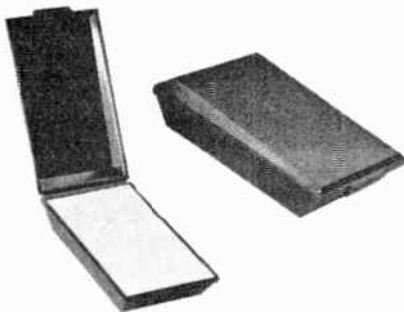
Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

401 Box



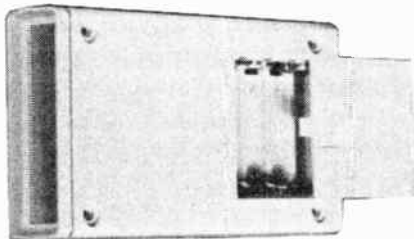
This box is moulded in white high impact ABS. It is designed as a hand-held plastic control box and will find many applications including model control, car racing controllers, ultrasonic controllers etc.

600 Series



A pair of boxes with hinged snap-shut lids. Moulded in black matt finish polypropylene. A clear anodised aluminium alloy front panel is supplied which clips into box. Pillars are moulded into base and a pcb may be mounted on these using selftapping screws (supplied). A flat area is located at the back of the box, designed for mounting sockets etc.

705 Box



This box has a very smart front bezel styling and is moulded in two sections (top and bottom) from light grey high impact polystyrene. Vertical guide slots are provided for fixing up to three circuit boards vertically and mounting points are provided for mounting circuit boards horizontally. Fixing into these points requires Self-Tapper No. 4 x 3/8in. (not supplied). An all round tongue and groove joint between box sections ensures rigidity and excellent sealing. The two sections are held together by four screws which enter through countersunk holes in the base. Feet are not supplied, but our Stick-on-Feet are suitable for use with this box. Plastic film covered aluminium front panel is supplied. The box has a moulded in battery compartment with a clip-on lid which fits tightly into place. The compartment has a moulded-in holder for four HP7 type batteries, with sprung metal connectors to hold them in place and provide the electrical connection.

Overall Dimensions

Type	Verob Part No.	Width (mm)	Depth (mm)	Height (mm)
101	202-21029J	65	120	40
102	202-21030K	80	150	50
103	202-21031G	110	188	60
106	202-21027E	50	100	25
201	202-21034J	205	140	40

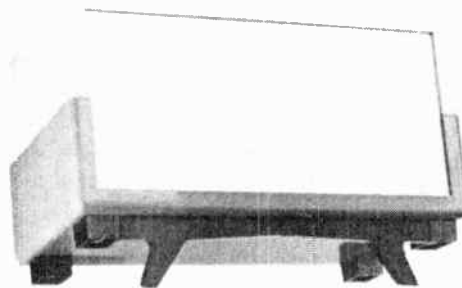
Type	Verob Part No.	Width (mm)	Depth (mm)	Height (mm)
202	202-21035F	205	140	75
203	202-21036G	205	140	110
211	202-21040F	153	84	39.5
212	202-21041C	153	84	59
213	202-21042L	153	84	79
214	202-21037L	180	120	40
215	202-21038H	180	120	65
216	202-21039N	180	120	90
217	202-21033A	171	121	75/37.5
301	202-21024B	71.5	49	24.5
303	202-21390D	120	80	35
305	202-21391A	180	110	55
401	202-21026G	94	61	27
601	202-21317D	75	130	34
602	202-21319J	127	196	51
705*	202-21306L	92	155	45

*Includes battery compartment and clip-on lid

Order

LH00A	(Verobox 101)	£3.70
LH01B	(Verobox 102)	£4.25
LL00A	(Verobox 103)	£5.75
LL03D	(Verobox 106)	£3.95
LL05F	(Verobox 201)	£7.95
LL06G	(Verobox 202)	£8.95
LL07H	(Verobox 203)	£10.95
LL08J	(Verobox 211)	£4.50
LL09K	(Verobox 212)	£4.95
LL10L	(Verobox 213)	£5.95
LQ07H	(Verobox 214)	£5.32
LQ08J	(Verobox 215)	£5.65
LQ09K	(Verobox 216)	£5.95
LL11M	(Verobox 217)	£6.95
LL12N	(Verobox 301)	78p
LH50E	(Verobox 303)	£1.85
LH51F	(Verobox 305)	£2.95
LL14Q	(Verobox 401)	98p
LQ03D	(Flip-Top Box 601 Blk)	£3.50
LQ05F	(Flip-Top Box 602 Blk)	£5.25
LH30H	(Verobox 705)	£7.95

Tilt Leg Assembly



A tilt leg which fits Veroboxes type 201, 202 and 203. Supplied with four rubber feet and a tilt leg which hinges up when not in use.

Order

HQ47B	(Tilt Leg Large)	£2.45
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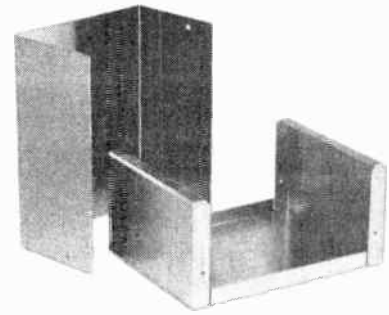
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METAL BOXES

Aluminium Boxes

A range of low cost aluminium boxes with lid.

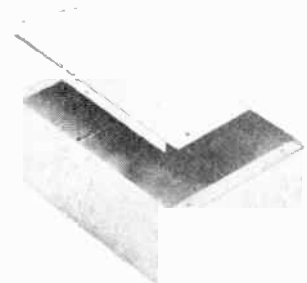


Type	Length mm (ins)	Width mm (ins)	Height mm (ins)
AB12	76 (3ins)	51 (2ins)	25 (1 ns)
AB11	102 (4ins)	64 (2½ins)	51 (2ins)
AB9	102 (4ins)	70 (2½in)	38 (1½ins)
AB28	102 (4ins)	70 (2½ins)	64 (2½ins)
AB23	102 (4ins)	102 (4ins)	64 (2½ins)
AB7	133 (5½ ns)	70 (2½ins)	38 (1½ins)
AB10	133 (5½ins)	102 (4ins)	38 (1½ins)
AB24	133 (5½ins)	102 (4ins)	64 (2½ins)
AB13	152 (6ins)	102 (4ins)	51 (2ins)
AB31	152 (6ins)	114 (4½ins)	76 (3ins)
AB15	203 (8ins)	152 (6ins)	76 (3ins)

Order

LF08J	(Box AB7)	98p
LF10L	(Box AB9)	98p
LF11M	(Box AB10)	98p
LF12N	(Box AB11)	98p
LF13P	(Box AB12)	80p
LF14Q	(Box AB13)	£1.30
XB71N	(Box AB15)	£2.50
LF15R	(Box AB23)	£1.20
LF16S	(Box AB24)	£1.25
LH10L	(Box AB28)	£1.20
XB69A	(Box AB31)	£1.50

Chassis



Aluminium chassis with four sides and corner plates, and aluminium base panel.

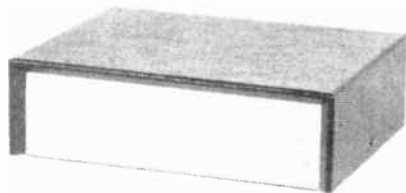
Dimensions:

Type No.	Length	Height	Width
AC64	152.5	63.5	102
AC86	203	63.5	152.5

Order

XB56L	(Chassis AC64)	£1.80
XB68Y	(Chassis AC86)	£2.40

Vinyl-Covered Boxes



A range of very low cost aluminium boxes consisting of a 'U' shaped base and a cover of black PVC-coated aluminium.

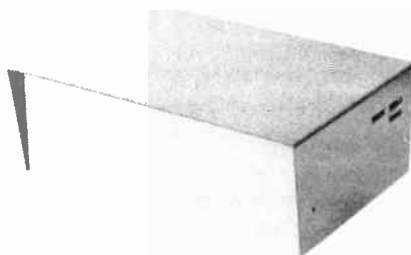
Dimensions (mm)

Width	Depth	Height	Type No.
127	63.5	57	Case WB1 Vinyl
152	114	44	Case WB2 Vinyl
203	127	51	Case WB3 Vinyl
230	133	63.5	Case WB4 Vinyl
279	159	76	Case WB5 Vinyl
279	190	89	Case WB6 Vinyl
305	159	133	Case WB7 Vinyl

Order

LF02C	(Case WB1 Vinyl)	£1.98
LH37S	(Case WB2 Vinyl)	£2.95
LH38R	(Case WB3 Vinyl)	£3.50
LH39N	(Case WB4 Vinyl)	£3.95
LH40T	(Case WB5 Vinyl)	£4.95
LH41U	(Case WB6 Vinyl)	£5.95
LH42V	(Case WB7 Vinyl)	£6.95

Aluminium Instrument Cases



A range of superbly finished instrument cases having a two-part construction and including a chassis. The cases have a visor-shaped top with ventilation slots punched in the sides. Top and sides section is finished in glossy blue hammertone and the base, front and rear section is finished in glossy birch grey. The base is fitted with self-adhesive feet. The chassis which fits into the base of the box is 10mm high.

The following sizes are available (mm)

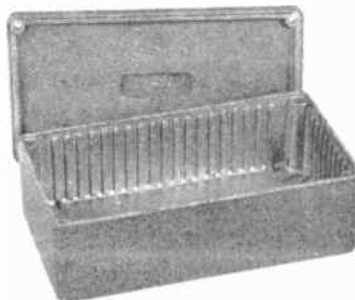
Model	Width	Depth	Height
235	100	150	100
212	150	100	75
231	150	150	75
236	150	150	100
222	200	125	75
226	200	125	100
237	200	150	100
233	250	150	75
238	300	150	100

Order

XY41U	(Blue Case 235)	£4.95
XY42W	(Blue Case 212)	£4.70
XY44X	(Blue Case 231)	£5.90
XB67X	(Blue Case 236)	£6.60
XY45Y	(Blue Case 222)	£5.70
XY46A	(Blue Case 226)	£6.70
XY47B	(Blue Case 237)	£7.95
XY48C	(Blue Case 233)	£6.95
XY49D	(Blue Case 238)	£9.95

Diecast Boxes

Aluminium alloy diecast boxes finished in grey hammertone. The boxes have close-fitting flanged lids to provide fully screened enclosures. The box has guide slots for holding 1.5mm thick pcb's. Fixing screws are supplied.



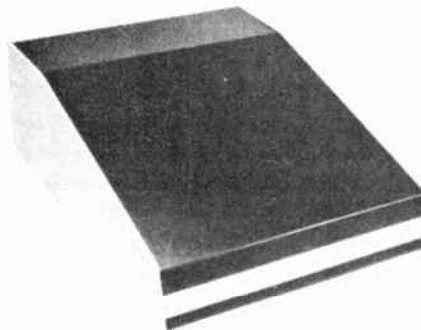
Type	Internal (mm)	External (mm)
M5002	96 x 46 x 21	100 x 50 x 25
M5004	116 x 61 x 36	120 x 65 x 40
M5007	116 x 91 x 56	120 x 95 x 60
M5005	146 x 76 x 46	150 x 80 x 50
M5006	186 x 106 x 56	190 x 110 x 60

Order

LH70M	(Box DCM5002)	£2.40
LH71N	(Box DCM5004)	£3.35
LH72P	(Box DCM5007)	£4.45
LH73Q	(Box DCM5005)	£3.95
LH74R	(Box DCM5006)	£5.95

Sloping Front Cases

High quality sloping front all aluminium construction cases. Top is finished in a matt black stove enamel with a narrow brushed aluminium trim at the front (which could be lettered with a name for example). Base is finished in a textured light stone colour. Ventilation holes are punched in the base and rear. The control area slopes at 15° from the horizontal. Self-adhesive feet are supplied.



The following sizes are available (mm).

Model	Width	Height Rear	Height Front	Length of Front of Top	Length Base
103	165	76	33	160	56
108	431	76	33	160	56

Order

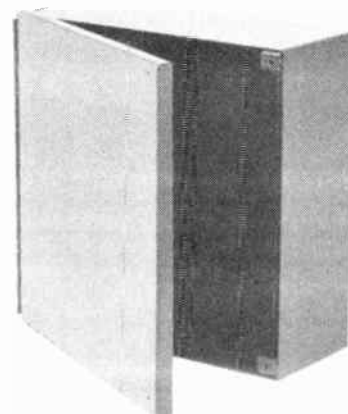
XY59P	(Console 103)	£10.95
XY60Q	(Console 108)	£15.95

PHONE NOW
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Phone before 2pm for same day despatch.

Wallbox

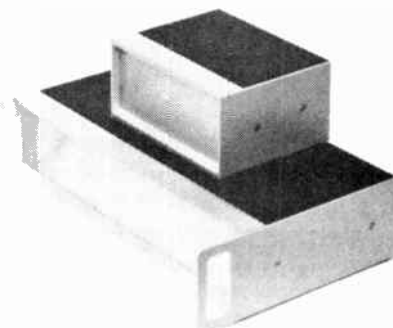


A large, steel case that is a plain, undrilled version of the wallbox used to house the Maplin Home Security System. The case is 250mm square (9 7/8 x 9 7/8 in.) by 100mm (4 in.) deep. The flanged lid is hinged along the length of one side, and is secured in the closed position by two 2BA round-head screws, not supplied. Although primarily intended to be mounted on a wall, the case may find applications in many other areas where a tough, durable enclosure is required, but it is not really suitable for use outdoors. The case is finished in grey enamel.

Order

YJ11M	(Wallbox Plain)	£9.95
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NM Instrument Cases



A multi-part instrument case to suit a variety of applications. The construction is based on four high quality anodised aluminium extrusions. The unique assembly system provides easy access, allowing the top, base, rear and chassis panels to be removed without dismantling the case frame. Only the two front extrusions are visible on the assembled case, and these form a recessed escutcheon and attractive satin trim. The case is supplied packed flat and includes all fixing screws and self-adhesive feet. The top, base and rear panels are in matt black, the side panels are in textured grey, and the front panel is in brushed aluminium.

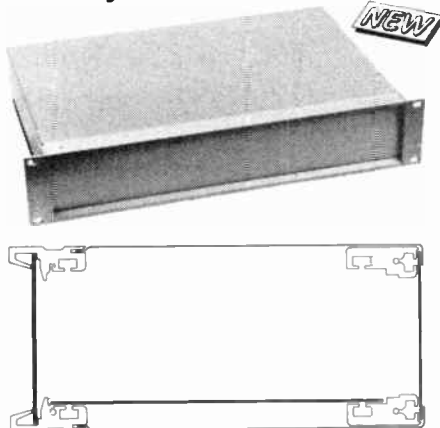
Model	Width	Depth	Height
NM1	200	187	90
NM2	300	150	90
NM3	300	150	130
NM4	390	187	90
NM5	390	187	130
NM6H	200	187	90
NM7H	325	187	130

Note Models NM6H and NM7H have handles formed in the side plates.

Order

YK41U	(Instrument Case NM1)	£11.95
YK42V	(Instrument Case NM2)	£13.95
YK43W	(Instrument Case NM3)	£15.95
YK44X	(Instrument Case NM4)	£16.95
YK45Y	(Instrument Case NM5)	£18.95
YK46A	(Instrument Case NM6)	£12.95
YK47B	(Instrument Case NM7)	£17.95

Rack Style Instrument Cases



A pair of professional quality instrument cases, suitable for mounting in 19in. equipment racks, and having fixing brackets at each side. The front and rear structures are based on four heavy duty aluminium extrusions. The front structure supports the recessed satin anodised front panel, and the combined alloy extrusions and top and bottom panels of steel form a strong rigid case with no fixing screws visible either at the front or on top of the case. A separate chassis plate locates in the bottom of the case so that components can be mounted internally leaving the exterior unmarked. Each case is supplied packed flat with assembly instructions. Finished in anodised satin alloy with stoved epoxy semi-gloss cream covers.

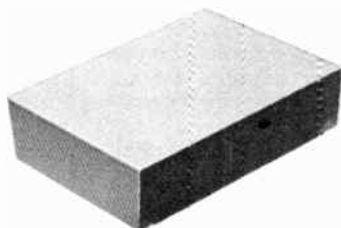
Two sizes available (dimensions in mm.):

Type	Overall Width	Depth	Height	Front Panel Width
230	483	300	89	432
330	483	300	133	432

Order

XG84F	(19" Rackmount 89 hgt)	£24.95
XG85G	(19" Rackmount 133Hgt)	£27.95

G-Range Cases



A range of beautifully finished cases featuring a black PVC clad aluminium alloy upright front panel surrounded by a sloping visor. The case top which slides on over the front and rear panels and is fixed by four screws through the feet on the base is 14swg (2mm thick) solid aluminium alloy etched and anodised to give a superb hard glistening silver finish. The front and rear panels are also removable and although the working surfaces, front, rear and base are totally accessible for drilling and component assembly, the fastenings that hold the box together are completely hidden when the box is assembled.

The boxes are available in two sizes:

Overall dimensions (mm)

Type	Width	Depth	Height
3G	224	176	64
4B	304	210	84

Order

XQ09K	(G-Range 3G)	£17.95
XQ10L	(G-Range 4B)	£24.95

Wood-End Cases

Two very attractive cases with wood veneered end cheeks and an internal chassis. The end cheek wood veneers are matched and polished American Walnut. The rest of the cabinet is manufactured in aluminium. The rear panel is finished in matt black stove enamel as are the top and base. Internal frames, chassis and front panel are finished in glossy birch grey and a self-adhesive brushed aluminium strip is supplied for fixing to the front panel if required. The base is fitted with rubber feet. The internal chassis is 7mm high. The front edge of the top and base is finished with a polished aluminium trim. Fixing screws are only visible from the rear.



The following sizes are available (mm)

Model	Width	Depth	Height	Front Panel Size
1437	392	177	80	356 x 63
1449	392	227	104	356 x 87

Order

XY57M	(Wood-End Case 1437)	£19.95
XY58N	(Wood-End Case 1449)	£23.95

ACCESSORIES FOR BOXES AND CASES

Cabinet Feet



Black soft synthetic rubber feet 15.9mm (.625in.) dia. 4BA clearance mounting hole. Supplied in packs of four.

Order

FW19V	(Feet Cab)	8p
--------------	------------	----

Stick-On Feet



Flexible plastic stick-on feet with a strong adhesive backing. Simply peel off backing sheet and press on - will adhere to most surfaces. Size: depth 3.5mm; diameter 11.5mm. Supplied as a set of four.

Order

FW38R	(Stick-on Feet)	24p
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Heavy-Duty Feet

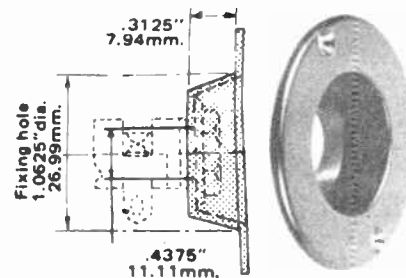


Large heavy-duty plastic moulded cabinet feet with inset 2BA fixing hole. Overall diameter: 37mm. Height: 15mm. Supplied singly.

Order

FW39N	(HD Feet)	10p
--------------	-----------	-----

Recess Plate

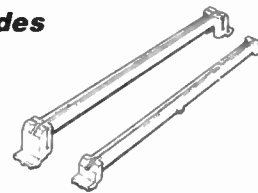


A recess plate to allow flush mounting of our jack sockets and some other panel mounting components.

Order

HH23A	(Recess Plate)	15p
--------------	----------------	-----

PCB Guides



These guides snap into the basic frame and allow fitting of pcb's or modules. Two types are available, one to fit standard size Eurocards (160 x 100mm) and one to fit modules and standard size International Cards (165 x 114.3mm). Two are required except for 12E and 24E modules when four are required.

Order

YR54J	(Eurocard Guide)	48p
YR55K	(Mod Int Card Guide)	38p

PCB Mounting Bracket



These brackets are used to fix cards to front panels and are moulded in black ABS. They give a rigid fixing and allow maximum space for components on the front panel. Supplied in kits of two brackets and fastenings.

Order

YR53H	(PCB Brackets)	80p
--------------	----------------	-----

Castors



A heavy duty castor with a 50mm (2in.) diameter plastic wheel connected via a ball race to a 50mm square mounting plate. Fixing by four corner holes 38 x 38 x 6.3mm. dia. Supplied in pairs only.

Order

FX96E	(Castors)	£2.95
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Chromed Portable Cabinet Legs



A set of very smart chromed legs, primarily designed for use with our piano cabinets. They are very easily assembled and dismantled, but are very rigid in use. Finish is bright chrome flashed on tubular steel with rectangular tube section crosspiece. Size: 480mm (19in.) across base of leg; 230mm (9in.) long cabinet fixing plate with fixing holes 200mm (8in.) apart; overall width of legs 960mm (38in.); overall height 685mm (27in.).

Order

XY31J (Piano Legs) £29.95

Ventilation Grille



Manufactured in black in a specially heat-resistant nylon. Fits cut-out size 142 x 35mm.

Order

FX06G (Cool Grille) 38p

HANDLES Plastic Handle

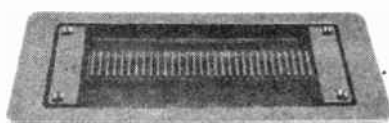


A strong handle moulded from glass filled nylon and with an elegant matt black appearance with very high strength. The handle has a black plastic insert and is supplied with fixing bolts. Fixing centres: 63mm. Overall size: 89 x 38 x 8mm. Bolts require 4BA hole.

Order

FG42V (Plastic Handle) 80p

Heavy-Duty Strap Handle with Recess Plate



This is a high quality all-plastic assembly designed for use on all types of portable instrumentation. The design and materials give a breaking strength above 200kg. Fixing is by four woodscrews or suitable nuts and bolts. The recess plate permits flush mounting so cabinets can be stacked. Supplied in black matt only. Fits recess size 210 x 85mm, 15mm deep. Overall size is 250 x 110mm. Comes as four pieces, screws are not supplied.

Order

BK29G (HD Strap + Recess) £2.95

Carrying Handle



Strap-type carrying handle, with chrome end pieces and fixing bolts and black plastic handle. Overall length with handle fully retracted 165mm approx.

Order

FW81C (Handle) 80p

Heavy-Duty Strap Handle



A heavy duty strap-type flexible carrying handle. Moulded in a smart black ribbed flexible plastic with a strong sprung steel carrier. End pieces are black plastic. Overall length with handle fully retracted: 200mm.

Order

FW82D (HD Strap Handle) £1.25

Flexible Handle

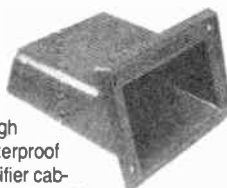


A flexible handle in matt black glass filled nylon for extra strength despite its slim and stylish appearance. Rated at 60lbs loading capacity. It is provided with two recessed screw holes suitable for self tapper No.8, 2BA etc. Length 179mm, width 25mm, height 20mm. Fixing centres: 155 x 5.4mm dia.

Order

FG79L (Flex Handle) 80p

Recess Handle



A flush fitting cabinet handle made from tough black impact and shatterproof material ideal for amplifier cabinets and other heavy casings. Cut-out required: 48 x 105mm. Total depth in cabinet: 75mm. Bezel dimensions: 134 x 68mm. Fixing centres: 113 x 46mm.

Order

LH08J (Recess Handle) 48p

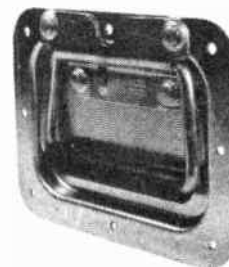
Heavy Duty Handle

A heavy duty flush fitting black cabinet handle with a strong 25.4mm bar. Ideal for speaker cabinets and other very heavy casings. Cut-out required: 225 x 125mm. Total depth in cabinet: 63mm. Bezel dimensions: 159 x 273mm. Fixing centres: 124 x 124 x 133mm.

Order

LH11M (Heavy Duty Handle) £2.95

Flight Case Handle



A heavy duty flip handle as used on flight cases. Fits rebate size 142 x 95 x 15mm.

Order

YL05F (Flip Handle) £4.95

CABINET CORNERS Plastic Type



Moulded in extra tough black nylon, they are designed to protect the corners of small or large portable cabinets.

Order

YX00A (Cab Corners Small) 25p
FX04E (Cab Corner Large) 18p

Metal Type

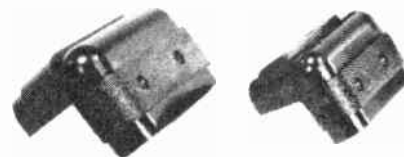


High quality chromed metal corner protectors available for two or three-side fixing.

Order

FX94C (Corner Two-Side) 25p
FX95D (Corner Three-Side) 35p

Cabinet Corner/Foot



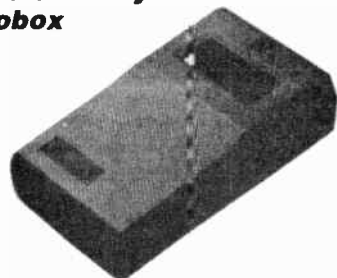
Moulded from rigid black PE, they are designed for use on ply or chipboard cabinets. Fixing is by countersunk screws, and screw holes are rebated to avoid abrasion. They are available in two sizes, approx heights are 85mm and 55mm.

Order

BK25C (Cab Corner/Foot Lge) 60p
BK26D (Cab Corner/Foot Sm) 45p

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Maplin SHOP
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Calculator-Style Hand-Held Verobox



An attractive calculator-style hand-held box moulded in black ABS plastic with a textured finish. A battery compartment is moulded into the case and has its own clip-on cover. The compartment will accept two PP3 batteries. Three pillars are provided in the base to which a PCB measuring 105 x 56mm may be fixed using No. 4 self-tapping screws. A PCB (107 x 71) can also be mounted in the top section using the



pillar next to the battery compartment. The box is supplied with four self-tapping screws for holding the two parts together. In the top section of the case (window end) there is a removable insert to facilitate cable entry.

Overall size: 154 x 81 x 37.5/33mm.
Window size: 49 x 20mm.

Order

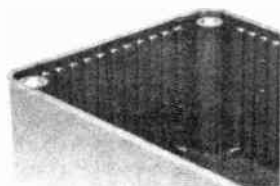
YK24B (Calc-Style Verobox).....£3.85

2000 Range Plastic Boxes



A complementary range of plastic boxes similar to the MB range but in different sizes and moulded in grey ABS with brass inserts. Lid is lipped to ensure a good fit and fixing screws are supplied. The box has guide slots for holding 1.5mm thick pcb's.

Type	Internal(mm)	External(mm)
2002	96 x 46 x 21	100 x 50 x 25
2004	116 x 61 x 36	120 x 65 x 40
2005	146 x 76 x 46	150 x 80 x 50
2006	186 x 106 x 56	190 x 110 x 60



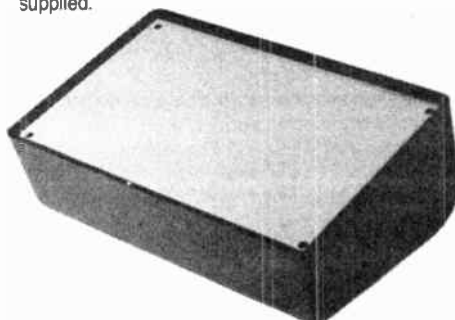
A slotted plastic strap is supplied with this box so that boards mounted lengthwise are supported at the top in the middle. However if this strap is used the height available will be reduced to 50mm.

Order

WY03D (ABS Box 2002).....	£1.25
LH60Q (ABS Box 2004).....	£1.55
LH61R (ABS Box 2005).....	£1.75
LH62S (ABS Box 2006).....	£3.25

Desk Console Style 1

Glossy black finish boxes moulded in ABS with brass inserts and having a sloping aluminium front panel that sits recessed into the top of the box. The box has guide slots for holding 1.5mm thick pcb's and 3mm high stand-off bosses in the base (for use with self-tappers No. 4). The aluminium front panel is finished in a matt light grey on one side and is 1mm thick. Front panel fixing screws and stick-on feet are supplied.

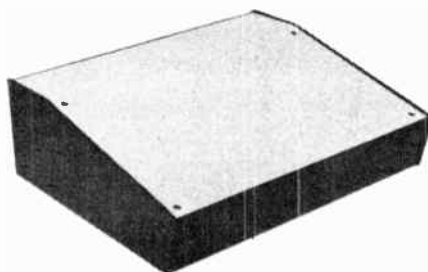


Type	Internal (mm)	External (mm)
M1005	156 x 91 x 47/34	161 x 96 x 61/39
M1006	210 x 125 x 62/41	215 x 130 x 78/47

Order

LH63T (ABS Console M1005).....	£2.50
LH64U (ABS Console M1006).....	£3.70

Desk Console Style 2



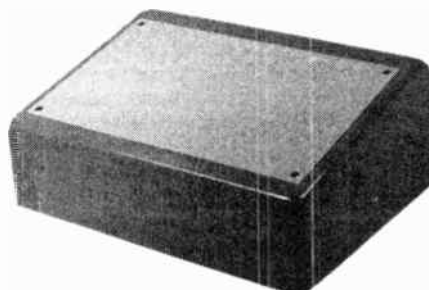
Glossy black finish boxes moulded in ABS with brass inserts and having an aluminium front panel flat at the rear then sloping down to the front. The box has 3mm high stand-off bosses in the base (for use with No. 4 self-tapping screws). The aluminium front panel is finished in a matt light grey and is 1mm thick. Front panel fixing screws and stick-on feet are supplied.

Type	External	Max pcb size
M6005	105 x 143 x 55/31	80 x 128
M6006	170 x 143 x 55/31	140 x 128
M6007	170 x 213 x 82/31	140 x 198

Order

LH65V (ABS Console M6005).....	£2.85
LH66W (ABS Console M6006).....	£3.50
LH67X (ABS Console M6007).....	£4.95

Desk Console Style 3



A three-part construction box moulded in grey ABS with brass inserts, a sloping aluminium front panel and a separate ABS base. The base has 3mm high stand-off bosses for use with No. 4 self-tapping screws and the main part has slotted sides for pcb

mounting. The aluminium front panel is finished in a matt light grey and is 1mm thick. Front panel and base fixing screws and four stick-on feet are supplied.

Type M8005 dimensions(mm)

External:	169 x 126 x 70/45
Internal:	163 x 121 x 55/35
Front panel:	157 x 92
Max pcb size in base:	160 x 100

Type M8007 dimensions(mm)

External:	243 x 187 x 103/66
Internal:	237 x 182 x 85/55
Front panel:	225 x 135
Max pcb size in base:	233.4 x 160

Order

LH68Y (ABS Console M8005).....	£3.95
LH69A (ABS Console M8007).....	£6.95

PCB Guide Adaptor



A plastic moulding that can be slid into the pcb guide slots on boxes type M4003-4-5, M2002-4-5-6, M1005-6, M5002-4-5-6-7, M6006-7 and M8005-7. The adaptor grips the board horizontally and with one adaptor on each of the four corners of a pcb the whole assembly may be slid into a box. Pcb's may be stacked using the adaptor then finally the adaptor cut so that the box lid holds it in place. Adaptors are 52mm long.

Order

YR72P (Pcb Guide Adaptor)..... 6p

Plastic Boxes with Aluminium Panel



A range of glossy black finish plastic boxes moulded in ABS with brass inserts and having an aluminium top panel. The panel sits recessed into the top of the box. The box has guide slots for holding 1.5mm thick pcb's. The aluminium panel is finished in a matt light grey on one side and is 1mm thick. Screws and four stick-on feet supplied.

Type	Internal (mm)	External (mm)
M4003	80.5 x 51.5 x 26	85 x 56 x 35
M4004	106.5 x 66.5 x 39	111 x 71 x 48
M4005	156.5 x 91.5 x 50	161 x 96 x 59

Order

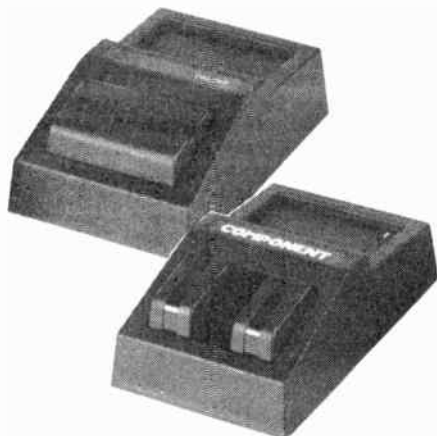
WY00A (Metal Panel Bx M4003).....	£1.60
WY01B (Metal Panel Bx M4004).....	£1.80
WY02C (Metal Panel Bx M4005).....	£2.50

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Foot Switches



A pair of tough moulded plastic foot switches that are extremely robust and reliable. Available in double and single switch format, they also form the ideal basis for effects units, as they include PCB mounting bosses, a 0.25in jack socket, and one or two switches. The single switch box also has a built-in battery compartment suitable for a PP3 size battery. Dimensions: 125 x 87 x 47mm (max)

Order

YK74R (Single Foot Switch)	£6.95
YK75S (Double Foot Switch)	£7.50

Foot Switch with Lead



A tough shatterproof ABS box with scratch resistant textured finish and non-slip rubber base pads. Large, easy-to-use foot-operated actuator has push-on, push-off action.

Specification:

Max voltage	: 125V
Max current	: 0.5A
Switch life	: 100,000 operations
Contact resistance	: 5mΩ

The box has a knock-out to fit an LED and a position to stick on a name or logo, and is supplied with 2.5m of single core screened lead terminated in a standard (1/2in) mono jack plug. Overall size: 121 x 82 x 46

Order

YK26D (Pedal Switch Box)	£5.95
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PSU Box



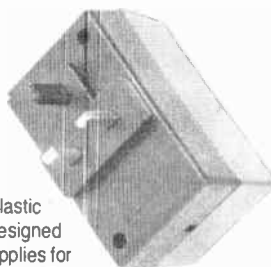
A moulded black plastic case with ventilation holes in top and base. Various holes are punched in the case — a 1/2in hole central in each end and various fixing holes in the base. The base has four plastic feet moulded on it.

Internal dimensions: 107 x 57 x 38mm high. Designed primarily for small power supplies.

Order

LF03D (PSU Box)	£1.48
-----------------	-------

PSU Box with Plug



A moulded black plastic case specifically designed to house power supplies for low voltage equipment. The case features a plastic earth pin and brass live and neutral pins to allow the unit to plug directly into a 13A socket. It will accommodate the components of a power supply including the transformer, and safety is assured with the inclusion of a special internal moulding which, as well as retaining the earth pin, separates the mains input from the low voltage output circuitry and transformer laminations. The case is in impact resistant ABS in two screw together sections and incorporates a shallow recess intended for a label.

External dimensions: 56.5 x 92 x 62.5mm.

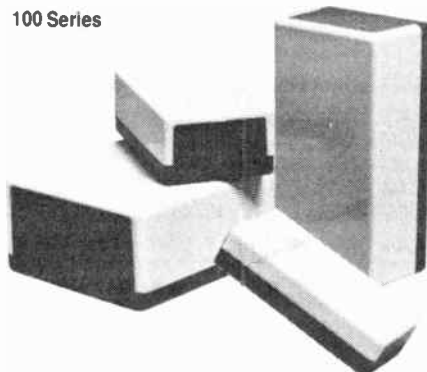
Order

FG41U (PSU Box and Plug)	£2.45
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PLASTIC VEROBXES

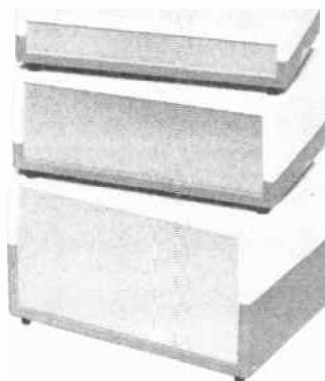
A range of high quality moulded boxes featuring a tongue and groove construction to ensure a perfect fit.

100 Series

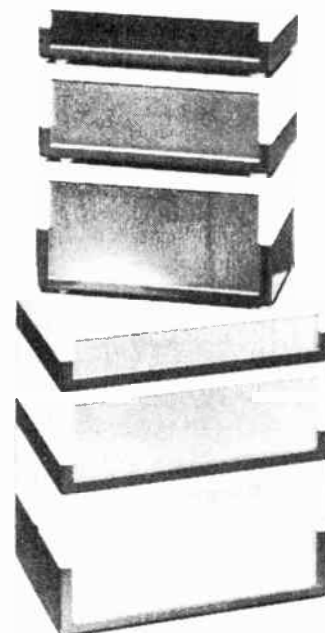


Type 100 boxes are moulded in two-tone grey high impact polystyrene with the two parts held together by screws. The lower section is provided with threaded (M3) brass inserts for mounting circuit boards.

200 Series



Type 200 boxes are moulded in two-tone grey high impact ABS. Top and bottom sections which include fixing points for circuit boards or chassis plates are held together by four screws entering through the base concealed by plastic feet through which they pass. Anodised aluminium front and rear panels are

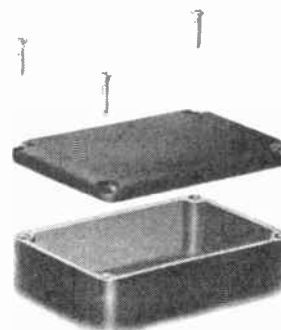


automatically retained in position when the two halves of the box are screwed together. Moulded guide slots are provided to allow circuit boards to be mounted vertically. On 210 types, the boxes clip together and therefore have no screws, though four



self-adhesive feet are provided. Type 217 is different in that the front panel is fixed with four screws and vertical guide slots are not provided.

300 Series



These boxes are moulded in high impact ABS and are supplied with lid and four self-tapping screws. All types are black.



**FAST SERVICE
LOWEST PRICES**

HINGES

Small Lift-Off Hinge



A small chromed hinge, overall size 47 x 39mm. Two per pack.

Order

YL24B (Small Hinge) 98p

Lift-Off Hinge



A chromed lift-off hinge, overall size 57 x 45mm. Two per pack.

Order

YL04E (Lift off Hinge) £2.95

Lockable Catch



A spring loaded lockable catch. Overall size: 55 x 33mm. Supplied with two keys. Two per pack.

Order

YL25C (Lockable Catch) 98p

FLEXIBLE LAMINATE PANELS

A completely new idea to help you make your home-made cabinets look professional. Easier to fit than real wood-veneer, but grained to feel and look like real wood. It is flexible and easier to cut with a sharp knife than "Formica" type laminates, so that corners are easily effected. It has a very strong adhesive backing, but will always lie completely flat unlike "Fablon" type laminates, which are prone to having air bubbles. The material is inherently strong enough to eliminate the possibility of corners unsticking and curling up, but it is flexible enough to stick to cylindrically curved surfaces.

Wood-Grain Effect



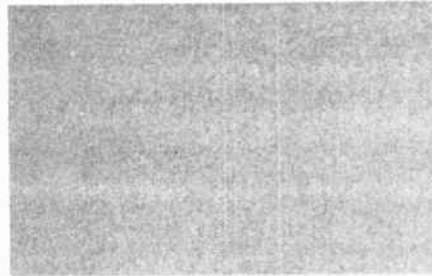
This effect is available in a dark wood finish only. Supplied in 0.838 x 0.305 metre (2ft 9in x 1ft) sheets, sufficient to cover the top and sides of most speaker cabinets. The dark wood effect is Penang Walnut.

Order

XY18U (Laminate Penang W/Nu) £2.95

Brushed Aluminium Effect

This effect is ideal for front panels since holes can be very easily cut and trimmed neatly and transfer lettering sticks positively. The effect is extremely attractive and gives an apparent non-reflective depth to the panel. Supplied in two sizes. Small: 292 x 241mm (11½ x 9½in.). Large: 482 x 190mm (19 x 7½in.).



Order

XY19V (Laminate Alum Small) £2.20
XY20W (Laminate Alum Large) £2.95

MATERIALS

Loudspeaker Cabinet Wadding

A high quality wadding, acoustically designed for use in loudspeaker cabinets. The material is 2.54cm (1in) thick, but may be layered to make up greater thickness. Available in 0.61m (24in) widths only, and is sold per ½m (19½in).

Note: Price shown is for ½m length. We will cut to length required in multiples of ½m only. Max. length in one piece: 18m.

Order

RY06G (Acoustic Wadding) 68p

Loudspeaker Grille Cloth



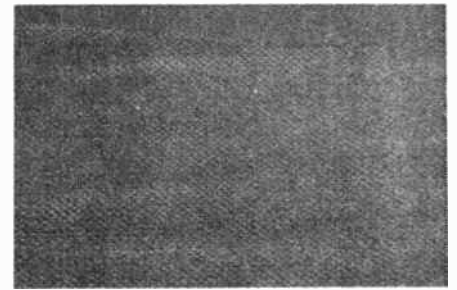
A high quality Tygan material for use as grille cloths on loudspeaker cabinets. The material is acoustically highly transparent. It is available in two widths: 1.14m (45in.) and 0.57m (22½in.), and is sold per ½m length (9.8in.). Available in two colours, black or a brown which will complement light or dark woods.

Note: Price shown is for ½m length. We will cut to length required in multiples of ½m only. Max length in one piece 30m.

Order

RY00A (Black Tygan 45in.) £1.95
RY01B (Black Tygan 22.1/2in) 98p
RY02C (Brown Tygan 45in.) £1.95
RY03D (Brown Tygan 22.1/2in) 98p

Cabinet Covering Cloth



A high quality cloth-backed plastic material for covering cabinets. Very hard-wearing and similar to "Rexine" in appearance. To fix, simply glue to chipboard or plywood etc. Available in black only. It is available in two widths: 1.27m (50in) and 0.635m (25in) and is sold per ½m length (9.8in).

Note: Price shown is for ½m length. We will cut to length required in multiples of ½m only. Max length in one piece: 30m.

Order

RY04E (Covering Cloth 50in.) 98p
RY05F (Covering Cloth 25in.) 50p

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CABLES

Cable Clips	81
House Wiring Cable	77

IDC Cable	76
Mains Cable	76

Screened Cable	76
Sleeving	80

WIRE Wire-Wrapping Wire (1/0.25)

A solid-core single silver-plated copper conductor designed especially for wire-wrapping. Insulation resists shrinkage when soldering.

Single core:	1/0.25mm silver-plated 30AWG. (33SWG)
Sheath:	0.125mm Kynar
Overall diameter:	0.5mm
Nom. conductor area:	0.05mm ²
Max. working voltage:	300V RMS
Max. current:	0.4A
Colours:	Black red and white

On 25m reels only.

Order	
BL77J (Wire-Wrap Black)	£1.98
BL82D (Wire-Wrap Red)	£1.98
BL83E (Wire-Wrap White)	£1.98

Solid Core Wire (1/0.6)



A wire having a single solid core ideal for plate-wiring (running wires across a chassis with all wires straight or at right-angles to one another) because wire stays exactly in formed shape without ties.

Single core:	1/0.6mm copper 22AWG (23SWG)
Sheath:	0.3mm PVC — conforms to DEF61-12 (part 6) Type 2
Overall diameter:	1.2mm
Nom. conductor area:	0.28mm ²
Max. working voltage:	1000V RMS
Colours:	Black, Blue, Brown, Green, Orange, Red, White, Yellow.

In 10m packs and on 100m drums.

Order	
BL85G (Bell Wire Black)	28p
PA56L (100m Bell Wire Blk)	£2.20
BL86T (Bell Wire Blue)	28p
PA57M (100m Bell Wire Blu)	£2.20
BL87U (Bell Wire Brown)	28p
PA58N (100m Bell Wire Brn)	£2.20
BL88V (Bell Wire Green)	28p
PA59P (100m Bell Wire Grn)	£2.20
BL90X (Bell Wire Orange)	28p
PA60Q (100m Bell Wire Orn)	£2.20
BL92A (Bell Wire Red)	28p
PA61R (100m Bell Wire Red)	£2.20
BL94C (Bell Wire White)	28p
PA62S (100m Bell Wire Wht)	£2.20
BL95D (Bell Wire Yellow)	28p
PA63T (100m Bell Wire Yel)	£2.20

Light-Duty Connection Wire (10/0.1)



A flexible wire, which is ideal for signal interconnections within apparatus where it is necessary to pack a large number of wires into a small space.

Stranded core, single:	10/0.1mm copper
Sheath:	0.3mm PVC
Overall diameter:	0.9mm

Nom. conductor area:	0.0785mm ²
Max. working voltage:	1000V RMS
Max. current:	0.5A
Colours available:	Black, Blue, Brown, Green, Grey, Orange, Pink, Red, Violet, White, Yellow.

On 25m reels only.

Order	
BL46A (L/C Wire Black)	70p
BL47B (L/C Wire Blue)	70p
BL48C (L/C Wire Brown)	70p
BL49D (L/C Wire Green)	70p
BL50E (L/C Wire Grey)	70p
BL51F (L/C Wire Orange)	70p
BL52G (L/C Wire Pink)	70p
BL53H (L/C Wire Red)	70p
BL54J (L/C Wire Violet)	70p
BL55K (L/C Wire White)	70p
BL56L (L/C Wire Yellow)	70p

Hook-Up Wire (7/0.2)



A flexible wire for general interconnections within apparatus.

Stranded core, single:	7/0.2mm copper
Sheath:	0.3mm PVC — conforms to DEF61-12 (part 6) Type 2
Overall diameter:	1.2mm
Nom. conductor area:	0.22mm ²
Max. working voltage:	1000V RMS
Max. current:	1.4A
Colours:	Black, Blue, Brown, Green, Grey, Orange, Pink, Red, Violet, White, Yellow.

In 10m packs, 100m reels and 1000m drums.

Order	
BL00A (7/0.2 Wire 10M Blk)	30p
PA45Y (100m 7/0.2 Wire Blk)	£2.65
PA28F (1000m 7/0.2 Wire Blk)	£24.00
BL01B (7/0.2 Wire 10M Blu)	30p
PA46A (100m 7/0.2 Wire Blu)	£2.65
PA29G (1000m 7/0.2 Wire Blu)	£24.00
BL02C (7/0.2 Wire 10M Brn)	30p
PA47B (100m 7/0.2 Wire Brn)	£2.65
PA30H (1000m 7/0.2 Wire Brn)	£24.00
BL03D (7/0.2 Wire 10M Grn)	30p
PA48C (100m 7/0.2 Wire Grn)	£2.65
PA31J (1000m 7/0.2 Wire Grn)	£24.00
BL04E (7/0.2 Wire 10M Gry)	30p
PA49D (100m 7/0.2 Wire Gry)	£2.65
PA32K (1000m 7/0.2 Wire Gry)	£24.00
BL05F (7/0.2 Wire 10M Orn)	30p
PA50E (100m 7/0.2 Wire Orn)	£2.65
PA33L (1000m 7/0.2 Wire Orn)	£24.00
BL06G (7/0.2 Wire 10M Pnk)	30p
PA51F (100m 7/0.2 Wire Pnk)	£2.65
PA34M (1000m 7/0.2 Wire Pnk)	£24.00
BL07H (7/0.2 Wire 10M Red)	30p
PA52G (100m 7/0.2 Wire Red)	£2.65
PA35N (1000m 7/0.2 Wire Red)	£24.00
BL08J (7/0.2 Wire 10M Vio)	30p
PA53H (100m 7/0.2 Wire Vio)	£2.65
PA36P (1000m 7/0.2 Wire Vio)	£24.00
BL09K (7/0.2 Wire 10M Wht)	30p
PA54J (100m 7/0.2 Wire Wht)	£2.65
PA37Q (1000m 7/0.2 Wire Wht)	£24.00
BL10L (7/0.2 Wire 10M Yel)	30p
PA55K (100m 7/0.2 Wire Yel)	£2.65
PA38R (1000m 7/0.2 Wire Yel)	£24.00

Special Pack

Special pack containing eleven 10m coils (one of each colour of above 7/0.2 Wire 10m.)

Order

XL10L (7/0.2 Wire 11C)	£2.95
------------------------	-------

Hook-Up Wire (16/0.2)



A flexible wire for general purpose and heavy duty interconnections within apparatus.

Stranded core, single:	16/0.2mm copper
Sheath:	0.3mm PVC — conforms to DEF61-12 (part 6) Type 2
Overall diameter:	1.6mm
Nom. conductor area:	0.5mm ²
Max. working voltage:	1000V RMS
Max. current:	3A
Colours:	Black, Blue, Brown, Green, Grey, Orange, Pink, Red, Violet, White, Yellow.

In 10m packs and 100m reels.

Order

FA26D (16/0.2 Wire 10M Blk)	45p
PA64U (100m 16/0.2 Wire Blk)	£4.40
FA27E (16/0.2 Wire 10M Blu)	45p
PA65V (100m 16/0.2 Wire Blu)	£4.40
FA28F (16/0.2 Wire 10M Brn)	45p
PA66W (100m 16/0.2 Wire Brn)	£4.40
FA29G (16/0.2 Wire 10M Grn)	45p
PA67X (100m 16/0.2 Wire Grn)	£4.40
FA30H (16/0.2 Wire 10M Gry)	45p
PA68Y (100m 16/0.2 Wire Gry)	£4.40
FA31J (16/0.2 Wire 10M Orn)	45p
PA69A (100m 16/0.2 Wire Orn)	£4.40
FA32K (16/0.2 Wire 10M Pnk)	45p
PA70M (100m 16/0.2 Wire Pnk)	£4.40
FA33L (16/0.2 Wire 10M Red)	45p
PA71N (100m 16/0.2 Wire Red)	£4.40
FA34M (16/0.2 Wire 10M Vio)	45p
PA72P (100m 16/0.2 Wire Vio)	£4.40
FA35Q (16/0.2 Wire 10M Wht)	45p
PA73Q (100m 16/0.2 Wire Wht)	£4.40
FA36P (16/0.2 Wire 10M Yel)	45p
PA74R (100m 16/0.2 Wire Yel)	£4.40

Power Connection Wire (32/0.2)



A flexible wire, for earth and power interconnections within apparatus.

Stranded core, single:	32/0.2mm copper
Sheath:	0.6mm PVC — Conforms to DEF61-12 (Part 6) Type 3
Overall diameter:	2.5mm
Nom. conductor area:	1.0mm ²
Max. working voltage:	1500V RMS
Max. current:	6A (commercial rating 10A)
Colours:	Black, Blue, Brown, Green, Red, White, Green/Yellow.

Sold per metre (max. length in one piece 100m) and on 100m reels.

Order

XR32K (Wire 3202 Black)	10p
PA00A (100m Wire 3202 Blk)	£6.21

XR33L (Wire 3202 Blue)	10p
PA01B (100m Wire 3202 Blu)	£6.21
XR34M (Wire 3202 Brown)	10p
PA02C (100m Wire 3202 Brn)	£6.21
XR35Q (Wire 3202 Green)	10p
PA03D (100m Wire 3202 Grn)	£6.21
XR36P (Wire 3202 Red)	10p
PA04E (100m Wire 3202 Red)	£6.21
XR37S (Wire 3202 White)	10p
PA05F (100m Wire 3202 Wht)	£6.21
XR38R (Wire 3202 Grn/Ylw)	12p
PA06G (100m Wire 3202 Gn/Yl)	£6.21

High Current Wire (51/0.25) STAR BUY



A flexible wire for high current applications.

Stranded core, single: 51/0.25mm copper
Sheath: 0.8mm PVC - Conforms to BS6231 (Table 6) Type B

Overall diameter: 3.81mm
Nom. conductor area: 2.5mm²
Max. working voltage: 1500V RMS
Max. current: 20A
Colours: Black, Green, Red
Sold per metre (max. length in one piece 25m)

Order

XR57M (HC Wire Black)	30p
XR58N (HC Wire Green)	30p
XR59P (HC Wire Red)	30p

Extra-Flexible Wire STAR BUY



A very flexible wire ideal for test leads, and as interconnection wires which are frequently being moved.

Stranded core, single: 55/0.1mm copper
Sheath: 1mm very flexible PVC
Overall diameter: 2.8mm
Nom. conductor area: 0.43mm²
Max. working voltage: 2000V RMS
Max current: 6A
Colours: Black, Blue, Green, Red
Sold per metre (max. length in one piece 25m)

Order

XR40T (Extra Flex Black)	15p
XR41U (Extra Flex Blue)	15p
XR43W (Extra Flex Green)	15p
XR44X (Extra Flex Red)	15p

Miniature Extra-Flexible Wire



A smaller diameter flexible wire, for use with miniature probes or as test leads.

Stranded core: 30/0.1mm copper
Sheath: 1mm very flexible PVC
Overall diameter: 2.0mm
Max. working voltage: 500V RMS
Max. current: 1.5A
Colours available: Black, Red.
Sold per metre (max. length in one piece 25m)

Order

XR68Y (Min Extra Flex Black)	14p
XR69A (Min Extra Flex Red)	14p

E.H.T. Wire



A heavily insulated wire for very high voltage use. Ideal for use with our laser tube.

Stranded core, single: 16/0.2mm tinned copper
Sheath: 1.5mm flame-retardant white polythene sheathed with 0.55mm red PVC

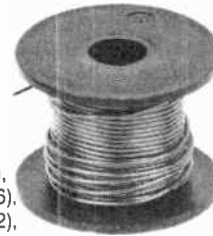
Overall diameter: 4.5mm
Nom. conductor area: 0.34mm²
Max. working voltage: 25kV
Sold per metre (max. length in one piece 25m)

Order

XR22Y (EHT Wire)	45p
------------------	-----

Enamelled Copper Wire

A 2oz roll of enamelled copper wire. Available in the following sizes mm (approx. swg): 2.0 (14), 1.5 (16), 1.25 (18), 1.0 (20), 0.8 (22), 0.56 (24), 0.5 (26), 0.4 (28), 0.315 (30), 0.25 (32), 0.244 (34), 0.2 (36), 0.15 (38), 0.125 (40), 0.1 (42), 0.08 (44) and 0.04 (48).

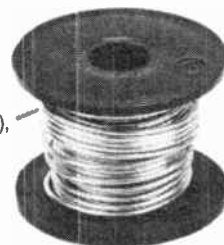


Order

BL16S (EC Wire 2.0mm 14swg)	60p
BL24B (EC Wire 1.5mm 16swg)	70p
BL25C (EC Wire 1.25mm 18swg)	75p
BL26D (EC Wire 1.0mm 20swg)	78p
BL27E (EC Wire 0.8mm 22swg)	80p
BL28F (EC Wire 0.56mm 24swg)	85p
BL29G (EC Wire 0.5mm 26swg)	90p
BL39N (EC Wire 0.4mm 28swg)	95p
BL40T (EC Wire 0.315mm 30swg)	98p
BL41U (EC Wire 0.25mm 32swg)	£1.00
BL42V (EC Wire 0.244mm 34swg)	£1.05
BL43W (EC Wire 0.2mm 36swg)	£1.05
BL44X (EC Wire 0.15mm 38swg)	£1.10
BL60Q (EC Wire 0.125mm 40swg)	£1.25
BL61R (EC Wire 0.1mm 42swg)	£1.50
BL62S (EC Wire 0.08mm 44swg)	£1.90
BL63T (EC Wire 0.04mm 48swg)	£4.95

Tinned Copper Wire

A 2oz roll of tinned copper wire. Available in the following sizes: mm (approx. swg) 1.5 (16), 1.25 (18), 1.0 (20), 0.8 (22) and 0.56 (24).



Order

BL11M (TC Wire 1.5mm 16swg)	70p
BL12N (TC Wire 1.25mm 18swg)	75p
BL13P (TC Wire 1.0mm 20swg)	80p
BL14Q (TC Wire 0.8mm 22swg)	82p
BL15R (TC Wire 0.56mm 24swg)	85p

CABLE Zip Connecting Cable STAR BUY

A flexible twin cable having a "figure 8" shape. Ideal for loudspeaker connections etc.

Stranded core, twin: 7/0.25mm copper
Sheath: White PVC with one side ribbed for identification of polarity

Overall size: 4.0 x 1.63mm
Nom. conductor area: 0.34mm²
Max. working voltage: 60V RMS
Max. current: 1A
Sold per metre (max. length in one piece 100m) and on 100m reels and on 1000m drums.

Order

XR39N (Zip Wire)	7p
PA75S (100m Zip Wire)	£6.10
PA07H (1000m Zip Wire)	£54.95

Heavy Duty Loudspeaker Cable



A flexible twin cable having a "figure 8" shape. The cable will carry up to 15A at 60V rms (17CV peak) suitable for amplifiers up to 500W output.

Stranded core, twin: 42/0.2mm copper
Sheath: White PVC with one side marked with black line for identification of polarity

Overall size: 6 x 3mm
Nom. conductor area: 1.32mm²
Max. working voltage: 60V RMS
Max. current: 15A

Sold per metre (max. length in one piece 100m) and on 100m reels.

Order

XR60Q (HD Loudspeaker Cable)	32p
PA08J (100m HD L/spkr Cable)	£29.95

Hi-Fi Loudspeaker Cable



A flexible twin cable having a "figure 8" shape. The cable will carry up to 18A at 100V rms (280V peak). Recommended by Hi-Fi experts.

Stranded core, twin: 79/0.2mm copper
Sheath: White PVC with one side marked with a black stripe for polarity identification.

Overall size: 7 x 4mm
Nom. conductor area: 2.48mm²
Max. working voltage: 100V RMS
Max. current: 18A
Sold per metre (max length in one piece 100m)

Order

XR72P (HiFi Loudspkr Cable)	45p
PA09K (100m HiFi Spkr Cable)	£39.95

Signal/Burglar Alarm Cable NEW



A general purpose 4-core signal cable, ideal for use with security alarms and other applications where low voltages and low currents are being used. The cable contains four flexible wires each having 7 strands of 0.2mm tinned copper wire insulated with PVC. Insulation colours are:

Red, Blue, Yellow, Black.
Overall insulation is in white PVC.
Max. working voltage 60V RMS
Max. current per core 1A
Overall diameter: 3.5mm

Sold per metre (max. length in one piece 100m) and on 100m reels.

Order

XR89W (4-Wire Burglar Cable)	12p
PA77J (100m 4-Wire Burglar)	£9.95

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Telephone Cable



A high quality cable complying with British Telecom specification CW 1308 for use in wiring telephones in customers' premises. It is also ideal for use in other low voltage, low current applications. The cable contains four solid tinned annealed copper conductors each 0.5mm diameter insulated with PVC. Insulation colours are:

blue-white white-blue
orange-white white-orange

Overall insulation is in white PVC

Nom. conductor area: 0.2mm²

Max. working voltage: 80V

Max. current per core: 0.25A

Overall diameter: 3.6mm

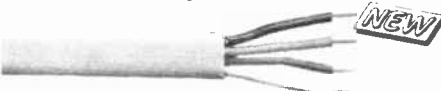
Sold per metre (max. length in one piece 100m) and on 100m reels.

Note: 'British Telecommunications requires of any person who connects subscribers' apparatus directly or indirectly to any telecommunication system, that it runs to comply with the terms and conditions relating to the attachment of subscribers' apparatus under which service is provided by B.T.'

Order

XR66W (4-Wire Phone Cable)	15p
PA76H (100m 4-Wire Phone)	£9.50

Flat IPC Telephone Line Cord



Four way flat D section telephone line cord specifically designed for use with the latest style 4-way IPC (Insulation Piercing Connector) jack plugs, see Connectors Section.

The stranded wires are 7 x 0.15mm, and colour coded Red, Blue, Green and White, and are sheathed overall in a light grey PVC sheath.

For details of how to attach this cable to the 4-way IPC BT line jack plug see telephone accessories in the Connectors Section.

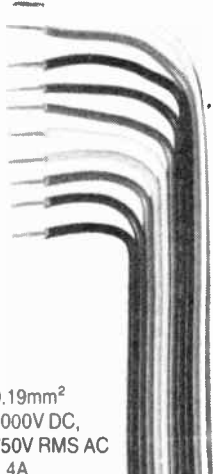
Sold per metre (max. length in one piece 100m).

Order

XR86T (4-Way Flat BT Cable)	18p
--	------------

Ribbon Cables

A flat ribbon-type cable which facilitates wiring in confined spaces. Stranded cores, 14 x 0.13mm tinned copper conductors sheathed in various colour PVC then bonded to its neighbours to form a flat 'ribbon'.



Nom. conductor area: 0.19mm²
Max. working voltage: 1000V DC,
750V RMS AC
Max. current per core: 1.4A

Core colours: 1 Black, 2 Brown, 3 Red, 4 Orange, 5 Yellow, 6 Green, 7 Blue, 8 Violet, 9 Grey, 10 White; then repeated.

Three types available:

10 way (overall size 13 x 1.3mm)

20 way (overall size 26 x 1.3mm)

30 way (overall size 39 x 1.3mm)

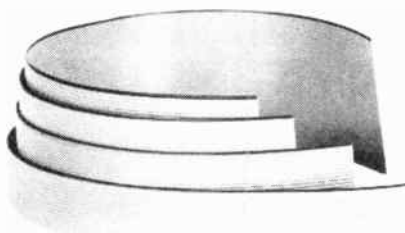
Sold per metre (max. length in one piece 50m)

Order

XR06G (Ribbon Cable 10 Way)	65p
XR07H (Ribbon Cable 20 Way)	£1.30
XR67X (Ribbon Cable 30 Way)	£1.95

INSULATION DISPLACEMENT CABLE

Insulation Displacement Cable 0.05in Spacing



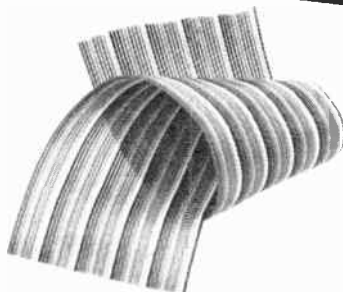
Flat Cable for the 0.05in spacing IDC connectors in the Connectors Section of this catalogue, available in 16, 20, 26, 34, 40 and 50 ways. The grey insulation has a red identifying strip along one edge.

Sold per 30cm (approx 12in). Max. length in one piece 30m. Also available on 30m reels.

Order

XR73Q (Flat IDC Cable 16way)	25p
PA22Y (30m Flat IDC 16way)	£19.95
XR74R (Flat IDC Cable 20way)	29p
PA23A (30m Flat IDC 20way)	£24.95
XR75S (Flat IDC Cable 26way)	34p
PA24B (30m Flat IDC 26way)	£30.95
XR76H (Flat IDC Cable 34way)	45p
PA25C (30m Flat IDC 34way)	£42.95
XR77J (Flat IDC Cable 40way)	55p
PA26D (30m Flat IDC 40way)	£50.95
XR79L (Flat IDC Cable 50Way)	68p
PA27E (30m Flat IDC 50way)	£63.95

Colour Coded IDC Cable NEW



Flat IDC Cable, colour coded as our Ribbon Cable. Available in 16-way, 20-way, 26-way, 34-way, 40-way and 50-way. Each wire has a coloured sheath and is spaced on a 0.05 inch pitch. Stranded cores are 7 x 0.127mm. The cable is manufactured to UL2697. Sold per 30cm (approx. 12in.) Max. length in one piece 30m. Also available on 30m reels.

Order

XR80B (Clr Cd IDC Cable 16W)	31p
PA39N (30m Clr Cd IDC 16W)	£29.95
XR81C (Clr Cd IDC Cable 20W)	42p

PA40T (30m Clr Cd IDC 20W)	£39.95
XR82D (Clr Cd IDC Cable 26W)	53p
PA41U (30m Clr Cd IDC 26W)	£49.95
XR83E (Clr Cd IDC Cable 34W)	69p
PA42V (30m Clr Cd IDC 34W)	£64.95
XR84F (Clr Cd IDC Cable 40W)	80p
PA43W (30m Clr Cd IDC 40W)	£74.95
XR85G (Clr Cd IDC Cable 50W)	£1.10
PA44X (30m Clr Cd IDC 50W)	£94.95

Insulation Displacement Cable 0.1in Spacing



A flat ribbon-type cable for use with the 0.1in. insulation displacement connectors described in Connectors Section. The cable has flat pieces of insulation between each conductor so that the conductors are spaced exactly 2.54mm (0.1in.) apart. The cable may be easily split to make a smaller number of ways or to branch off a group of conductors. Stranded cores are 7 x 0.2mm tinned copper conductors sheathed in grey PVC. Every 1/2 metre the flat insulation is notched out and this is the point that is used to make connection to the special connectors. Available in 12-ways.

Nominal conductance area: 0.22mm²

Max. working voltage: 300V

Max. current per core: 1.4A

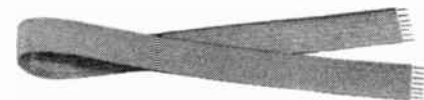
Number of ways: 12

Sold per metre (max length in one piece 30m)

Order

XR65V (IDC Cable 12-Way)	£2.45
---------------------------------------	--------------

Flexicable



For use as an inter-PCB connector, this cable comes in 7 and 10-way with a black stripe identifying one edge. Both are available in 300mm lengths only. The cables are zippable, and have a high degree of flexibility. They are single strand and can be soldered directly into a PCB.

Order

RK30H (Flexicable 7-way)	44p
RK31J (Flexicable 10-way)	50p

MAINS CABLES STAR BUY

2-Core 3A Mains Cable



A 2-core mains cable with double insulation suitable for low power use, lighting etc. Stranded core, two 16/0.2mm copper conductors

Sheath: Brown and blue PVC in an oval PVC overall sheath — conforms to BS6500 Tble 15.

Overall size: 5.4 x 3.4mm

Nom. conductor area: 0.5mm²

Max. current: 3A

Colours: Black or White.

Sold per metre (max. length in one piece 100m)

Also available on 100m reels.

Order

XR47B (Twn Mains DS Black)	18p
PA10L (100m Twn Mains Black)	£12.50
XR00A (Twn Mains DS White)	18p
PA11M (100m Twn Mains White)	£12.50

2-Core 6A Mains Cable



A 2-core mains cable with double insulation suitable for use with medium power double insulated appliances. Stranded core, two 24/0.2mm copper conductors

Sheath: Brown and blue PVC in a round PVC overall sheath – conforms to BS6500 Tble 16.
 Overall diameter: 6.5mm
 Nom. conductor area: 0.75mm²
 Max. current: 6A
 Colours: Orange or White
 Sold per metre (max length in one piece 50m)

Order	
XR61R (Twin 6A Mains Orange)	28p
XR62S (Twin 6A Mains White)	28p

3-Core 3A Mains Cable



A three core mains cable ideal for equipment having power ratings up to 750W. Stranded core, three 16/0.2mm copper conductors

Sheath: Brown, Blue and Grn/Yellow PVC in overall PVC sheath – conforms to BS6500 Tble 15.
 Overall dia.: 5.6mm
 Nom. conductor area: 0.5mm²
 Max. current: 3A
 Colours: Black or White
 Sold per metre (max. length in one piece 100m)

Order	
XR01B (Min Mains Black)	20p
XR02C (Min Mains White)	20p

3-Core 6A Mains Cable



A three core mains cable with a thick outer sheath available also in orange for added safety when used as a trailing lead e.g. on power tools. Stranded core, three 24/0.2mm copper conductors.

Sheath: Brown, Blue and Grn/Yellow PVC in a substantial overall PVC sheath – Conforms to BS6500 Table 16.
 Overall dia.: 6.9mm
 Nom. conductor area: 0.75mm²
 Max. current: 6A
 Colours: Black, White or Orange
 Sold per metre (max. length one piece 50m)

Order	
XR03D (C6A Mains Black)	28p
XR04E (C6A Mains White)	28p
XR05F (C6A Mains Orange)	28p

3-Core 13A Mains Cable



A three core mains cable with a thick outer sheath available also in orange for added safety when used as a trailing lead e.g. on power tools. Stranded core, three 40/0.2mm copper conductors

Sheath: Brown, Blue and Grn/Yellow PVC in a substantial overall PVC sheath – Conforms to BS6500 Table 16.
 Overall dia.: 7.5mm
 Nom. conductor area: 1.25mm²
 Max. current: 13A
 Colours: Black, White or Orange.
 Sold per metre (max. length in one piece 100m) and on 100m reels.

Order	
XR09K (HD Mains Black)	48p
PA12N (100m HD Mains Black)	£35.95
XR10L (HD Mains White)	48p
PA13P (100m HD Mains White)	£35.95
XR11M (HD Mains Orange)	48p
PA14Q (100m HD Mains Orange)	£35.95

Cotton Covered Mains Cable

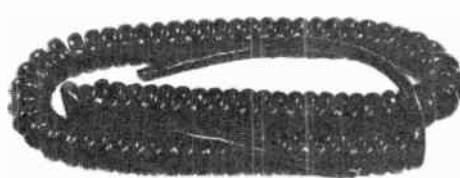


A three core heat resistant mains cable for use on irons, toasters, small electric fires (up to 1.4kW) etc. Stranded core, three 24/0.2mm copper conductors

Sheath: Brown, Blue and Grn/Yellow rubber in an overall sheath covered by black/white cellulose braid - conforms to BS6500.
 Overall dia.: 6.2mm
 Nom. conductor area: 0.75mm²
 Max. current: 6A
 Sold per metre (max. length in one piece 50m)

Order	
XR24B (Cotton Mains)	98p

Coiled Mains Cables



Three core extendible mains cable for use with tools, instruments etc. Two types are available; 1A type and 6A type.

1A Type
 Stranded core: three 25/0.1mm copper conductors
 Sheath: Brown, Blue and Green/Yellow PVC in a coiled black PVC sheath.
 Max. current: 1A
 Extended length: 1.8m

6A Type
 Stranded core: three 196/0.07mm copper conductors
 Sheath: Brown, Blue and Green/Yellow PVC in a coiled black PVC sheath.
 Max. current: 6A
 Extended length: 3.5m

Order	
BL71N (Stretchflex 1A)	£1.48
BL72P (Stretchflex 6A)	£4.95

4-Core 6A Mains Cable



A four-core flexible mains cable for use in mains controlled applications. Stranded core, four 24/0.2mm copper conductors

Sheath: Brown, Blue, Black and Green/Yellow rubber in a hard-wearing overall black rubber sheath to BS6500
 Overall diameter: 8.35mm
 Nom. conductor area: 0.75mm²
 Max. current: 6A
 Sold per metre (max. length in one piece 50m)

Order	
XR48C (4-Core Mains)	98p

HOUSE WIRING CABLES

All cables conform to BS6004: 1975 Tables 4 and 5.

1mm² Twin and Earth



A twin core and earth flat domestic wiring cable for use on lighting circuits. Three 1/1.13mm copper conductors. 300/500 Volt.

Sheath: Red and Black PVC plus unsheathed earth-continuity conductor, in an overall white PVC sheath.
 Overall size: 7.5 x 4mm
 Nom. conductor area: 1mm²
 Max current surface: 12A
 Max current enclosed: 11A
 Sold per metre (max length in one piece 50m)

Order	
XR49D (1.0mm TE Cable)	20p

1.5mm² Twin and Earth



A twin core and earth flat domestic wiring cable for use on separately fused spurs from ring main circuits. Two 1/1.38mm copper conductors, 300/500 Volt and earth.

Sheath: Red and Black PVC plus unsheathed earth-continuity conductor, in an overall white PVC sheath.
 Overall size: 8.5 x 4.75mm
 Nom. conductor area: 1.5mm²
 Max. current surface: 15A
 Max. current enclosed: 13A
 Sold per metre (max. length in one piece 50m)

Order	
XR50E (1.5mm TE Cable)	25p

2.5mm² Twin and Earth



A twin core and earth flat domestic wiring cable for use on ring mains and unfused spurs. Two 1/1.78mm copper conductors and earth 300/500V.

Sheath: Red and Black PVC plus unsheathed earth-continuity conductor, in an overall white PVC sheath.
 Overall size: 9.5 x 5.25mm
 Nom. conductor area: 2.5mm²
 Max. current surface: 21A
 Max. current enclosed: 18A
 Sold per metre (max. length in one piece 50m).

Order
XR51F (2.5mm TE Cable)..... 35p

6mm² Twin and Earth



A twin core and earth flat wiring cable for use on cooker points. Two 7/1.04mm copper conductors and earth 300/500V.

Sheath: Red and Black PVC plus unsheathed earth-continuity conductor, in an overall white PVC sheath.
 Overall size: 14 x 7.5mm
 Nom. conductor area: 6mm²
 Max. current surface: 35A
 Max. current enclosed: 30A
 Sold per metre (max. length in one piece 50m).

Order
XR52G (6mm TE Cable)..... 98p

1mm² Three Core and Earth



A three-core and earth flat domestic wiring cable for use on lighting circuits requiring double switching. Three 1/1.13mm copper conductors and earth 300/500V.

Sheath: Blue, Red and Yellow PVC plus unsheathed earth-continuity conductor in an overall white PVC sheath.
 Overall size: 10.5 x 4.6mm
 Nom. conductor area: 1mm²
 Max. current surface: 10A
 Max. current enclosed: 9A
 Sold per metre (max. length in one piece 50m).

Order
XR53H (1mm Trpl & ECC Cbl)..... 35p

SCREENED CABLES Miniature Single-Core Lapped Screen



A single screened cable ideal for general audio connections especially in equipment where a large number of cables have to be packed into a small area. Stranded core, 7/0.1mm copper conductor with PVC insulation, lap screened and sheathed overall in grey PVC.

Overall diameter: 2mm
 Nom. conductor area: 0.22mm²
 Capacitance (core to screen): 320pF/m
 Sold per metre (max length in one piece 100m).

Order
XR15R (Mln Screened)..... 10p

Single-Core Lapped Screen



A single screened cable ideal for general audio connections. Stranded core, 7/0.2mm copper conductor with PVC insulation, lap screened and sheathed overall in PVC.

Overall dia.: 3.1mm
 Nom. conductor area: 0.22mm²
 Capacitance (core to screen): 320pF/m
 Available sheathed overall in Black, Grey or White.
 Sold per metre (max. length in one piece 100m) and on 100m reels.

Order
XR12N (Cable Single Black)..... 15p
PA79L (100m Cable Singl Blk)..... £9.50
XR13P (Cable Single Grey)..... 15p
PA80B (100m Cable Singl Gry)..... £9.50
XR14Q (Cable Single White)..... 15p
PA81C (100m Cable Singl Wht)..... £9.50

Single-Core Braided Screen



A single screened cable ideal for connections to microphones. Stranded core, 16/0.2mm copper conductor with PVC insulation, braided screen and sheathed overall in black PVC.

Overall dia: 3.75mm
 Nom. conductor area: 0.5mm²
 Capacitance (core to screen): 360pF/m
 Sold per metre (max. length in one piece 100m) and on 100m reels.

Order
XR16S (Single Mlc Cable)..... 38p
PA16S (100m Singl Mlc Cable)..... £24.50

Low Noise Screened Cable



A very low noise single screened cable ideal for use with low-level signals. Stranded core, 10/0.1mm copper conductor with polythene insulation over which there is a layer of semi-conducting polythene. This is covered with a braided screen and sheathed overall in black PVC.

Overall dia.: 2.54mm
 Nom. conductor area: 0.0785mm²

Capacitance (core to screen): 102pF/m
 Nominal impedance: 50Ω

IMPORTANT NOTE

It is most important when connected that the semi-conducting sheath should not be able to come into contact with the centre conductor or anything connected to the centre conductor, but that it should be stripped back to the braiding. The cable is only suitable for use at audio frequencies.

Sold per metre (max. length in one piece 25m)

Order
XR18U (Low Noise Scnd)..... 45p

Low Capacity Screened Cable/UR76



A high quality screened cable for high performance audio connections. Stranded core, 7/0.32mm tinned copper conductor with polythene insulation, braided screen and sheathed overall in black PVC.

Overall dia.: 5mm
 Capacitance (core to screen): 100pF/m
 Max. voltage: 2.0kV
 Nominal impedance: 50Ω

This cable is also suitable for use at RF and has characteristics superior to UniRadio UR76/RG58C
 Attenuation per 10m: 4.0dB at 100 MHz
 37.0dB at 1000 MHz

Sold per metre (max. length in one piece 50m)

Order
XR19V (Low C Cable)..... 35p

Heavy Duty RF Cable/UR67



A high quality co-axial cable ideal for use as a transmitter up-lead. Stranded core, 7/0.77mm copper conductor with solid polythene insulation, braided screen and sheathed overall in black PVC.

Overall diameter: 10.3mm
 Capacitance (core to screen): 100pF/m
 Max. voltage: 5.0kV
 Nominal impedance: 50Ω
 Attenuation per 10m: 2.0dB at 100MHz
 4.5dB at 1000MHz

Sold per metre (max. length in one piece 50m)

Order
XR63T (UR67 RF Cable)..... 98p

Twin Overall Braided Screen



A twin screened cable ideal for use in low level balanced circuits e.g. low impedance balanced microphones. The cores are twisted together to assist in hum reduction. Stranded cores, 16/0.2mm copper conductors with red and black PVC insulation, braided screen and sheathed overall in black PVC.

Overall dia.: 6.3mm
 Nom. conductor area: 0.5mm²

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Capacitance
(core to screen): 171pF/m
(core to core): 120 pF/m

Sold per metre (max length in one piece 100m)

Order

XR08J (Twin Mic Cable) 68p

Twin Overall Lapped Screen

A twin screened cable ideal for general audio connections where crosstalk is not a problem. Stranded cores, 7/0.1mm copper conductors with red and blue PVC insulation, lap screened and sheathed overall in grey PVC. Cores are laid side by side in the cable such that the cable is oval in shape.

Overall size: 2 x 2.8mm
Nom. conductor area: 0.055mm²
Capacitance
(core to screen): 305pF/m
(core to core): 170pF/m

Sold per metre (max. length in one piece 100m)

Order

XR20W (Lapped Pair) 24p

Twin Individually Screened



A twin screened cable having each core individually screened and laid side by side in a figure '8' outer sheath thus keeping crosstalk problems to a minimum, but maintaining the advantages of a single cable. Stranded cores, 10/0.1mm copper conductor with PVC insulation, lap screened and sheathed overall in grey PVC.

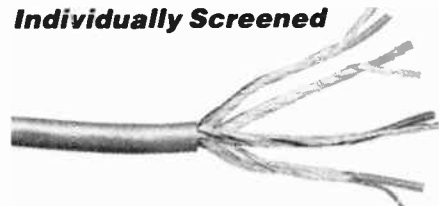
Overall size: 2 x 4.1mm
Nom. conductor area: 0.0785mm²
Capacitance
(core to screen): 350pF/m

Sold per metre (max. length in one piece 100m) and on 100m reels.

Order

XR21X (Cable Twin) 18p
PA17T (100m Cable Twin) £15.50

Four-Core Individually Screened



A four-core screened cable having each core individually screened, thus keeping crosstalk to a minimum. Stranded cores, 7/0.1mm copper conductor with yellow, blue, red and white polythene insulation, lap screened and sheathed overall in grey PVC.

Overall size: 5mm
Nom. conductor area: 0.055mm²
Capacitance
(core to screen): 95pF/m

Sold per metre (max. length in one piece 50m) and on 50m reels.

Order

XR23A (Cable Quad) 32p
PA18U (50m Cable Quad) £18.95

Four-Core Overall Screened



A four-core screened cable with particular application in quadraphonic equipment where crosstalk is not a problem. Stranded cores, 7/0.1mm tinned copper conductor with PVC insulation (red, blue, green and yellow), wrapped overall in Melinex tape then covered with a braided screen and sheathed in grey PVC.

Overall dia.: 3.15mm
Nom. conductor area: 0.055mm²
Max. working voltage: 250V RMS
Max. current per core: 0.25A

Capacitance
(core to screen): 190pF/m

Sold per metre (max. length in one piece 100m)

Order

XR25C (Multi-Core 4-Way) 58p

Multi-Core Screened Cable



A range of multi-core cables having overall screens. Stranded cores 7/0.1mm tinned copper conductors with PVC insulation wrapped overall in Melinex tape then covered with a braided screen and sheathed in grey PVC.

Nom. conductor area: 0.055mm²
Max. working voltage: 250V RMS
Max. current per core: 0.25A
Capacitance
(core to screen): 190pF/m

Core colours:

- 1 Red; 2 Blue; 3 Green; 4 Yellow; 5 White; 6 Black; 7 Brown; 8 Violet; 9 Orange; 10 Pink; 11 Turquoise; 12 Grey; 13 Red/Blue; 14 Green/Red; 15 Yellow/Red; 16 White/Red; 17 Red/Black; 18 Red/Brown; 19 Yellow/Blue; 20 White/Blue; 21 Blue/Black; 22 Orange/Blue; 23 Yellow/Green; 24 White/Green; 25 Orange/Green; 26 Green/Blue; 27 Grey/Blue; 28 Green/Black; 29 Grey/Green; 30 Yellow/Brown; 31 White/Brown; 32 Brown/Black; 33 Grey/Brown; 34 Yellow/Violet; 35 Violet/Black; 36 White/Violet

The following sizes are available:

- 6-core (overall dia. 3.55mm)
- 9-core (overall dia. 4.25mm)
- 15-core (overall dia. 5.35mm)
- 25-core (overall dia. 6.3mm)
- 36-core (overall dia. 6.9mm)

Sold per metre (max length in one piece 100m)

Order

XR26D (Multi-Core 6-Way) 58p
XR27E (Multi-Core 9-Way) 78p
XR28F (Multi-Core 15-Way) £1.15
XR46A (Multi-Core 25-Way) £1.55
XR54J (Multi-Core 36-Way) £2.10

Coiled Screened Cable

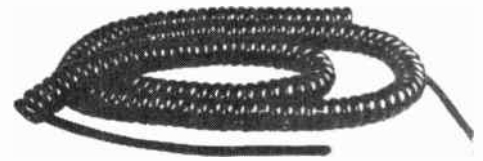


A single screened extendible cable with tinned prepared ends. Length 6m. Sheath available in Red and Black.

Order

BH30H (Scr Stretchflex Blk) £1.98
BH34M (Scr Stretchflex Red) £1.98

Twin Screened Coiled Cable



A coiled extendible cable with two overall screened conductors in a black PVC sheath. Length: 6m.

Order

HQ49D (Twin Stretchflex) £2.95

RADIO AND TV AERIAL CABLES



Miniature Co-ax



A very high quality miniature co-ax cable suitable for short interconnections between, for example, computer and monitor or TV, video recorders and similar applications. The cable has a 1/0.25mm copper conductor with solid polythene insulation, a good quality braided screen and a thin outer black sheath.

Overall dia. 2.8mm
Nominal impedance: 75Ω

Sold per metre (max. length in one piece 100m).

Order

XR88V (Miniature Coax) 25p

Low-Loss Co-ax



A low-loss co-axial cable intended for use as aerial downleads for UHF television sets. Solid core, 1/1.12mm copper conductor with cellular polythene insulation, braided screen and sheathed overall in brown or white PVC.

Overall dia: 7.25mm
Nom. conductor area: 0.985mm²
Capacitance
(core to screen): 56pF/m
Nominal impedance: 75Ω
Attenuation per 10m: 0.75dB at 100MHz
2.6dB at 900MHz

Sold per metre (max length in one piece 100m) and on 100m reels.

Order

XR29G (Brown Low-loss Coax) 15p
PA21X (100m Low Loss Coax) £13.95
XR87U (White Low-loss Coax) 15p
PA78K (100m L/Loss Coax Wht) £13.95

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300-Ohm Feeder

A balanced feeder cable intended for use as aerial downleads on European, Japanese and American tuners having no 75 ohm input. Stranded cores, 7/0.25mm copper conductors with clear polythene insulation.

Overall size: 8.9 x 2.9mm
 Nom. conductor area: 0.34mm²
 Capacitance (core to core): 13.2pF/m
 Nominal impedance: 300Ω
 Attenuation per 10m: 0.12dB at 100MHz
 1.68dB at 1000MHz

Sold per metre (max. length in one piece 100m)

Order

XR31J (Bal Feeder) 18p

Seven-Core Cable

A seven-core cable for use with Trailer Connectors. Stranded core, six 14/0.25mm and one 14/0.3mm copper conductors.

Sheath: Brown, Blue, Yellow, Green, Red, Black (14/0.25mm) and White (14/0.3mm) PVC in an overall black PVC sheath.

Overall dia.: 9mm
 Nom. conductor area: White 1mm², Other 0.7mm²
 Max. current: White 8.75A, Other 5.5A

Sold per metre (max. length in one piece 50m) and also on 50m reels.

Order

XA55K (7-Core Trailer Cable) 80p
XA20W (50m 7-Core Trailer) £29.95

SLEEVING

Heat-Shrinkable Sleeving

A heat-shrinkable crosslinked polyolefin material which will shrink to 50% of its original diameter when heated over 121°C. For more rapid shrinking higher temperatures may be used without detrimental effect. Shrinkage can be achieved by hot air blowers, gas flame, hot air or infrared ovens. Sleeving has high tensile strength (1500lbs/in²: 10.3MPa). It is resistant to solvents, acids, alkalis, fuel and oil. The continuous operating temperature should be between -55°C and +105°C. Self-extinguishing. Breakdown voltage >7kV. Colour is black.

Type	Size as supplied	Size (max) after shrinkage	Wall thickness after shrinkage	Break-down voltage
CP16	1.6mm	0.79mm	0.35mm	7kV
CP24	2.4mm	1.17mm	0.43mm	8.6kV
CP32	3.2mm	1.57mm	0.43mm	8.6kV
CP48	4.8mm	2.36mm	0.43mm	8.6kV
CP64	6.4mm	3.18mm	0.55mm	11kV
CP95	9.5mm	4.8mm	0.55mm	11kV
CP127	12.7mm	6.4mm	0.55mm	11kV

Supplied in 1m lengths only.

Order

BF86T (Heat Shrink CP 16) 58p
BF87U (Heat Shrink CP 24) 60p
BF88V (Heat Shrink CP 32) 62p
BF89W (Heat Shrink CP 48) 84p
BF90X (Heat Shrink CP 64) 90p
YR17T (Heat Shrink CP 95) £1.10
YR18U (Heat Shrink CP 127) £1.25

Heat Resistant Sleeving

An impregnated glass fibre sleeving resistant up to 400°C. Bore: 2mm Available in Black and Red.

Sold only in one metre lengths

Order

BL66W (Ht-Resist Sleeve Blk) 15p
BL70M (Ht-Resist Sleeve Red) 15p

Insulating Sleeve

A PVC insulating sleeve suitable for use up to 85°C. Available in the following sizes and colours:

1mm bore: Black, Green and Red
 2mm bore: Black, Green and Red
 4mm bore: Black, Green, Red, White and Yellow
 6mm bore: Black
 10mm bore: Black

Available in one metre lengths

Order

BH00A (Systoflex 1mm Black) 6p
BH02C (Systoflex 1mm Green) 6p
BH03D (Systoflex 1mm Red) 6p
BH06G (Systoflex 2mm Black) 9p
BH08J (Systoflex 2mm Green) 9p
BH09K (Systoflex 2mm Red) 9p
BH12N (Systoflex 4mm Black) 14p
BH14Q (Systoflex 4mm Green) 14p
BH15R (Systoflex 4mm Red) 14p
BH16S (Systoflex 4mm White) 14p
BH17T (Systoflex 4mm Yellow) 14p
BH42V (Systoflex 6mm Black) 18p
BH43W (Systoflex 10mm Black) 28p

Lacing Cord



A high grade tubular nylon-cored cord covered with a flexible PVC coating. Suitable for lacing wire and cable forms. Conforming to DEF5020.

Outside diameter: 1.1mm
 Working load: 10lbs
 Breaking strain: 17lbs

Sold on 25m reels

Order

BL65V (Lacing Cord) £1.55



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Spiral Cable Wrap



An expandable polythene spiral binding which simply wraps around the cable-form gripping it tightly. It will follow any route taken by the cableform and wires can be easily led out from the form. Resistant to chemical attack and has a high electrical resistance. Available in three sizes. May be supplied in white or black.

Type	Unexpanded outside dia.	Wall thickness
1/8in	3.18mm	0.79mm
1/4in	6.35mm	1.15mm
1/2in	12.7mm	1.58mm

Type	Pitch between lead out points	Suitable for cable forms of diameter
1/8in	5.56mm	1.59 to 12.7mm
1/4in	9.53mm	4.76 to 50.8mm
1/2in	12.7mm	9.53 to 101.6mm

Supplied per metre (max. length in one piece 30m)

Order

BL57M (Spirawrap 1/8in.) 15p
BL58N (Spirawrap 1/4in.) 17p
BL59P (Spirawrap 1/2in.) 38p

CABLE TIES

Self-Locking Cable Tie



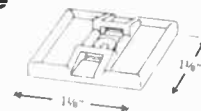
Self-locking cable ties for simple and quick binding of cables or components. Simply slip a Tie-Wrap around the bundle, thread tip through head, pull tight and cut-off. Available in three sizes:

Length	Min. dia.	Max. dia.
92	1.59	15.9
140	1.59	28.6
186	1.59	44.5

Order

BF91Y (Tie-Wrap 92) 2p
BF92A (Tie-Wrap 140) 3p
BF93B (Tie-Wrap 186) 4p

Cable Tie Base



A self-adhesive base moulded in nylon for use with our cable ties. Size: 29 x 29mm

Order

BF94C (Cable Tie Base) 15p

Re-Usable Cable Tie

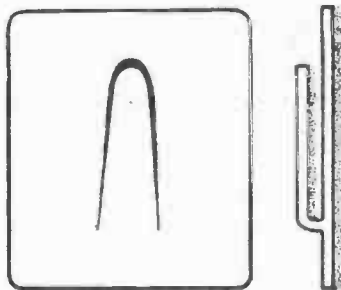
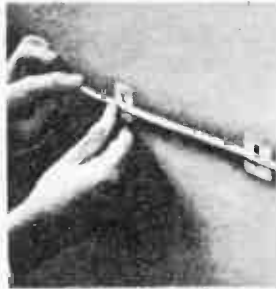


A locking re-usable cable tie. Length: 100m (4in.)

Order

RK59P (Re-Usable Cable Tie) 2p

Self-Adhesive Cable Fixings



Makes cabling simplicity itself. No more hammering nails into concrete, plaster etc. Just wipe the fixing surface to ensure that it is free from moisture, dust, oil or grease, peel of the clip's protective backing and press firmly into place on the surface. An average workman can fix 20 per minute – an enormous saving in labour time over conventional fixings. Also there is no noise – a further valuable advantage if cabling in occupied premises, hospitals etc.

The fixings are manufactured in 26swg zinc-finished electro-galvanised mild steel with cross-linked, acrylic adhesive coating on a cushion of closed cell polyethylene foam. The fixings will adhere to any clean flat surface; the foam cushion taking up any slight unevenness in the fixing surface giving maximum adhesion area.

Three types are available to suit different size cables:

Type	Size		Maximum Cable Diameter
	Width	Height	
4	25mm	25mm	4mm
8	25mm	38mm	8mm
12	38mm	42mm	12mm

Order

BH26D (Safix 4)	10p
BH27E (Safix 8)	12p
BH28F (Safix 12)	15p

Cable 'P' Clips



A range of nylon cable clamps. All inside edges of the clip are bevelled so that cables cannot be abraded. Colour is natural white.

Fixing hole is 5.1mm dia. (2BA clear). Thickness of nylon is 1.3mm. Width of clip is 9.5mm.

The following sizes are available to suit cables diameter:

4.8 to 6.3mm	Cable P Clip 3/16in.
6.3 to 7.9mm	Cable P Clip 1/4in.
7.9 to 9.5mm	Cable P Clip 3/8in.
9.5 to 12mm	Cable P Clip 1/2in.

Order

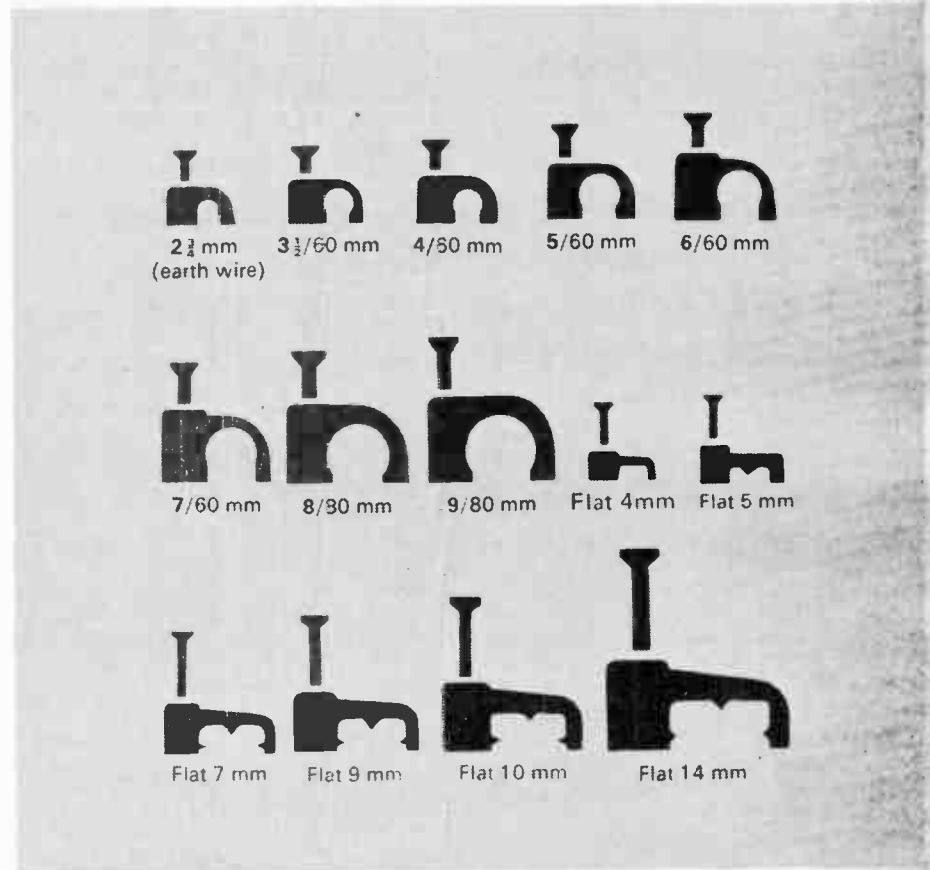
LR44X (Cable P Clip 3/16in.)	4p
LR45Y (Cable P Clip 1/4in.)	4p
LR46A (Cable P Clip 5/16in.)	4p
LR04E (Cable P Clip 3/8in.)	4p

Plastic Cable Clips

A range of plastic cable clips manufactured from high impact polystyrene which is weatherproof and shatterproof. All of the round clips push fit onto the cable and grip it firmly leaving both hands free for



positioning and fixing. Plated long life masonry nails are supplied with all clips except Round 2.75mm and Flat 4mm and 5mm which have carbon steel nails, blued for extra resilience.



2 1/4 mm
3 1/2/60 mm
4/50 mm
5/60 mm
6/60 mm
(earth wire)

7/60 mm
8/80 mm
9/80 mm
Flat 4mm
Flat 5mm

Flat 7mm
Flat 9mm
Flat 10mm
Flat 14mm

The following sizes are available:

Type	Pin Length	Pin diameter	Suits Cable of overall size
Round 2 3/4mm	15mm	1mm	2 to 3mm
Round 3 1/2mm	15mm	1.5mm	3 to 3 3/4mm
Round 4mm	15mm	1.5mm	3 3/4 to 4 1/2mm
Round 5mm	20mm	1.5mm	4 1/2 to 5 1/2mm
Round 6mm	22mm	1.5mm	5 1/2 to 6 1/2mm
Round 7mm	22mm	1.5mm	6 1/2 to 7 1/2mm
Round 8mm	25mm	2mm	7 1/2 to 8 1/2mm
Round 9mm	25mm	2mm	8 1/2 to 9 1/2mm
Flat 4mm	15mm	1mm	Zip Wire
Flat 5mm	15mm	1mm	Twin Mains DS
Flat 7mm	22mm	1.5mm	1.0mm ² TE
Flat 9mm	25mm	2mm	1.5mm ² TE
Flat 10mm	25mm	2mm	2.5mm ² TE and 1mm ² Triple ECC
Flat 14mm	25mm	2mm	6mm ² TE

Sold in packs of 20 and boxes of 100.

Order

BH18U (Hiatt Rd 2.75mm)	18p	YM00A (100 Hiatt Rd 2.75mm)	75p
BH19V (Hiatt Rd 3.5mm)	18p	YM01B (100 Hiatt Rd 3.5mm)	77p
BH20W (Hiatt Rd 4mm)	19p	YM02C (100 Hiatt Rd 4mm)	80p
BH21X (Hiatt Rd 5mm)	19p	YM03D (100 Hiatt Rd 5mm)	81p
BH22Y (Hiatt Rd 6mm)	20p	YM04E (100 Hiatt Rd 6mm)	85p
BH23A (Hiatt Rd 7mm)	20p	YM05F (100 Hiatt Rd 7mm)	86p
BH24B (Hiatt Rd 8mm)	22p	YM06G (100 Hiatt Rd 8mm)	90p
BH36P (Hiatt Rd 9mm)	24p	YM07H (100 Hiatt Rd 9mm)	95p
BH25C (Hiatt Flat 4mm)	24p	YM08J (100 Hiatt Flat 4mm)	98p
BH37S (Hiatt Flat 5mm)	24p	YM09K (100 Hiatt Flat 5mm)	98p
BH38R (Hiatt Flat 7mm)	25p	YM10L (100 Hiatt Flat 7mm)	£1.04
BH39N (Hiatt Flat 9mm)	25p	YM11M (100 Hiatt Flat 9mm)	£1.04
BH40T (Hiatt Flat 10mm)	27p	YM12N (100 Hiatt Flat 10mm)	£1.18
BH41U (Hiatt Flat 14mm)	34p	YM13P (100 Hiatt Flat 14mm)	£1.43

CAPACITORS

<i>Bi-Polar Electrolytic</i>	91	<i>Feed Throughs</i>	86	<i>Polystyrene</i>	86
<i>Ceramic</i>	84	<i>Interference Suppression</i>	88	<i>Silvered Mica</i>	86
<i>Ceramic Filter</i>	94	<i>Memory Back-up</i>	92	<i>Tantalum</i>	89
<i>Crystals</i>	93	<i>Mylar</i>	88	<i>Trimmers</i>	92
<i>Electrolytic</i>	89	<i>Polyester</i>	87	<i>Variable</i>	92

CAPACITOR FINDER

pF	nF	μF	Voltage (DC)	Tolerance	Type	Page	pF	nF	μF	Voltage (DC)	Tolerance	Type	Page
1.8			100	±0.25pF	Ceramic	85	390	0.39	100	±10%	Ceramic	85	
2.2			100	±0.25pF	Ceramic	85	390	0.39	500	±1%	1% Polysty	87	
2.7			100	±0.25pF	Ceramic	85	470	0.47	100	±10%	Ceramic	85	
3.3			100	±0.25pF	Ceramic	85	470	0.47	100	±10%	Monores	85	
3.9			100	±0.25pF	Ceramic	85	470	0.47	160	±5%	Polystyrene	87	
4.7			100	±0.25pF	Ceramic	85	470	0.47	350	±1%	Mica	86	
5			350	±0.5pF	Mica	86	470	0.47	500	±1%	1% Polysty	87	
5.6			100	±0.25pF	Ceramic	85	470	0.47	500	±20%	HV Disc	86	
6.8			100	±0.25pF	Ceramic	85	560	0.56	100	±10%	Ceramic	85	
8.2			100	±0.25pF	Ceramic	85	560	0.56	125	±1%	1% Polysty	87	
10			100	±2%	Ceramic	85	560	0.56	160	±5%	Polystyrene	87	
10			100	±5%	Monores	85	680	0.68	63	±10%	Ceramic	85	
10			350	±0.5pF	Mica	86	680	0.68	160	±5%	Polystyrene	87	
10			500	±10%	HV Disc	86	680	0.68	350	±1%	Mica	86	
12			100	±2%	Ceramic	85	680	0.68	500	±20%	HV Disc	86	
15			100	±2%	Ceramic	85	750	0.75	125	±1%	1% Polysty	87	
18			100	±2%	Ceramic	85	820	0.82	100	±10%	Ceramic	85	
22			100	±2%	Ceramic	85	1000	1	100	±10%	Ceramic	85	
22			100	±5%	Monores	85	1000	1	100	±10%	Monores	85	
22			160	±5%	Polystyrene	87	1000	1	100	±10%	Mylar	88	
22			350	±0.5pF	Mica	86	1000	1	125	±1%	1% Polysty	87	
27			100	±2%	Ceramic	85	1000	1	160	±5%	Polystyrene	87	
33			100	±2%	Ceramic	85	1000	1	200	±10%	Monocap	85	
33			160	±5%	Polystyrene	87	1000	1	350	±1%	Mica	86	
33			350	±0.5pF	Mica	86	1000	1	350	-20+80%	Feed Thro	86	
39			100	±2%	Ceramic	85	1000	1	400	±10%	Poly Layer	87	
47			100	±2%	Ceramic	85	1000	1	500	±20%	HV Disc	86	
47			100	±5%	Monores	85	1200	1.2	100	±10%	Ceramic	85	
47			160	±5%	Polystyrene	87	1200	1.2	125	±1%	1% Polysty	87	
47			350	±0.5pF	Mica	86	1500	1.5	100	±10%	Ceramic	85	
56			100	±2%	Ceramic	85	1500	1.5	125	±1%	1% Polysty	87	
68			100	±2%	Ceramic	85	1500	1.5	160	±5%	Polystyrene	87	
68			160	±5%	Polystyrene	87	1500	1.5	400	±10%	Poly Layer	87	
68			350	±1%	Mica	86	1800	1.8	100	±10%	Ceramic	85	
82			100	±2%	Ceramic	85	1800	1.8	125	±1%	1% Polysty	87	
100	0.1		100	±2%	Ceramic	85	2200	2.2	100	±10%	Ceramic	85	
100	0.1		100	±5%	Monores	85	2200	2.2	100	±10%	Monores	85	
100	0.1		160	±5%	Polystyrene	87	2200	2.2	100	±10%	Monocap	85	
100	0.1		350	±1%	Mica	86	2200	2.2	100	±10%	Mylar	88	
100	0.1		500	±1%	1% Polysty	87	2200	2.2	125	±1%	1% Polysty	87	
100	0.1		500	±10%	HV Disc	86	2200	2.2	160	±5%	Polystyrene	87	
120	0.12		100	±2%	Ceramic	85	2200	2.2	400	±10%	Poly Layer	87	
120	0.12		350	±1%	Mica	86	2200	2.2	500	-20+40%	HV Disc	86	
150	0.15		100	±2%	Ceramic	85	2700	2.7	100	±10%	Ceramic	85	
150	0.15		160	±5%	Polystyrene	87	2700	2.7	125	±1%	1% Polysty	87	
150	0.15		350	±1%	Mica	86	3300	3.3	100	±10%	Ceramic	85	
150	0.15		500	±1%	1% Polysty	87	3300	3.3	100	±10%	Monores	85	
180	0.18		100	±2%	Ceramic	85	3300	3.3	125	±1%	1% Polysty	87	
180	0.18		350	±1%	Mica	86	3300	3.3	160	±5%	Polystyrene	87	
220	0.22		100	±2%	Ceramic	85	3300	3.3	400	±10%	Poly Layer	87	
220	0.22		100	±5%	Monores	85	3900	3.9	100	±10%	Ceramic	85	
220	0.22		160	±5%	Polystyrene	87	3900	3.9	125	±1%	1% Polysty	87	
220	0.22		350	±1%	Mica	86	4700	4.7	100	±10%	Ceramic	85	
220	0.22		500	±1%	1% Polysty	87	4700	4.7	100	±10%	Monores	85	
270	0.27		100	±2%	Ceramic	85	4700	4.7	100	±10%	Monocap	85	
270	0.27		500	±1%	1% Polysty	87	4700	4.7	100	±10%	Mylar	88	
330	0.33		100	±2%	Ceramic	85	4700	4.7	125	±1%	1% Polysty	87	
330	0.33		160	±5%	Polystyrene	87	4700	4.7	160	±5%	Polystyrene	87	
330	0.33		350	±1%	Mica	86	4700	4.7	350	±1%	Mica	86	
330	0.33		500	±1%	1% Polysty	87	4700	4.7	400	±10%	Poly Layer	87	

pF	nF	μ F	Voltage (DC)	Tolerance	Type	Page	pF	nF	μ F	Voltage (DC)	Tolerance	Type	Page
4700	4.7	0.0047	500	-20+40%	HV Disc	86	220	0.22	100	\pm 20%	Monores	85	
4700	4.7	0.0047	1000	-20+40%	1000V Disc	86	220	0.22	250	\pm 20%	Polyester	88	
5600	5.6	0.0056	125	\pm 1%	1% Polysty	87	220	0.22	250AC	\pm 20%	IS Cap	88	
5600	5.6	0.0056	160	\pm 5%	Polystyrene	87	220	0.22	1000	\pm 10%	HV Cap	88	
6800	6.8	0.0068	100	\pm 10%	Monores	85	270	0.27	100	\pm 5%	Poly Layer	87	
6800	6.8	0.0068	125	\pm 1%	1% Polysty	87	330	0.33	35	\pm 20%	Tant	89	
6800	6.8	0.0068	160	\pm 5%	Polystyrene	87	330	0.33	50	\pm 20%	Monores	85	
6800	6.8	0.0068	400	\pm 10%	Poly Layer	87	330	0.33	100	\pm 5%	Poly Layer	87	
8200	8.2	0.0082	125	\pm 1%	1% Polysty	87	330	0.33	250	\pm 20%	Polyester	88	
8200	8.2	0.0082	400	\pm 10%	Poly Layer	87	390	0.39	100	\pm 5%	Poly Layer	87	
10,000	10	0.01	12	-20+80%	Minidisc	85	470	0.47	12	-20+80%	Minidisc	85	
10,000	10	0.01	50	-20+50%	Disc	86	470	0.47	35	\pm 20%	Tant	89	
10,000	10	0.01	63	\pm 1%	1% Polysty	87	470	0.47	63	\pm 20%	Minelect	89	
10,000	10	0.01	63	-20+80%	Ceramic	85	470	0.47	63	\pm 20%	Monores	85	
10,000	10	0.01	100	\pm 10%	Monocap	85	470	0.47	100	\pm 5%	Poly Layer	87	
10,000	10	0.01	100	\pm 10%	Monores	85	470	0.47	100	\pm 10%	Polyester	88	
10,000	10	0.01	100	\pm 10%	Mylar	88	470	0.47	100	\pm 20%	Axial	90	
10,000	10	0.01	160	\pm 5%	Polystyrene	87	470	0.47	100	\pm 20%	PC Elect	90	
10,000	10	0.01	250AC	\pm 20%	IS Cap	88	470	0.47	275AC	\pm 10%	IS Cap	88	
10,000	10	0.01	400	\pm 10%	Poly Layer	87	470	0.47	1000	\pm 10%	HV Cap	88	
10,000	10	0.01	400	\pm 20%	Polyester	88	560	0.56	100	\pm 5%	Poly Layer	87	
10,000	10	0.01	500	-20+40%	HV Disc	86	680	0.68	35	\pm 20%	Tant	89	
15,000	15	0.015	250	\pm 5%	Poly Layer	87	680	0.68	100	\pm 5%	Poly Layer	87	
15,000	15	0.015	400	\pm 20%	Polyester	88	680	0.68	100	\pm 10%	Polyester	88	
18,000	18	0.018	250	\pm 5%	Poly Layer	87		1	35	\pm 20%	Tant	89	
22,000	22	0.022	50	\pm 10%	Monocap	85		1	50AC	\pm 15%	Reversolytic	91	
22,000	22	0.022	50	-20+50%	Disc	86		1	63	\pm 20%	Minelect	89	
22,000	22	0.022	63	\pm 1%	1% Polysty	87		1	100	\pm 5%	Poly Layer	87	
22,000	22	0.022	63	-20+80%	Ceramic	85		1	100	\pm 10%	Polyester	88	
22,000	22	0.022	100	\pm 10%	Monores	85		1	100	\pm 20%	Axial	90	
22,000	22	0.022	100	\pm 10%	Mylar	88		1	100	\pm 20%	PC Elect	90	
22,000	22	0.022	160	\pm 5%	Polystyrene	87		1	1000	\pm 10%	HV Cap	88	
22,000	22	0.022	250	\pm 5%	Poly Layer	87		1.5	35	\pm 20%	Tant	89	
22,000	22	0.022	250AC	\pm 20%	IS Cap	88		2.2	35	\pm 20%	Tant	89	
22,000	22	0.022	400	\pm 20%	Polyester	88		2.2	50AC	\pm 15%	Reversolytic	91	
27,000	27	0.027	250	\pm 5%	Poly Layer	87		2.2	63	\pm 20%	Minelect	89	
33,000	33	0.033	100	\pm 10%	Monores	85		2.2	100	\pm 10%	Polyester	88	
33,000	33	0.033	250	\pm 5%	Poly Layer	87		2.2	100	\pm 20%	Axial	90	
33,000	33	0.033	250	\pm 20%	Polyester	88		2.2	100	\pm 20%	PC Elect	90	
33,000	33	0.033	250AC	\pm 20%	IS Cap	88		3.3	35	\pm 20%	Tant	89	
39,000	39	0.039	250	\pm 5%	Poly Layer	87		3.3	50AC	\pm 15%	Reversolytic	91	
47,000	47	0.047	12	-20+80%	Minidisc	85		3.3	100	\pm 20%	Axial	90	
47,000	47	0.047	25	\pm 5%	Polystyrene	87		4.7	16	\pm 20%	Tant	89	
47,000	47	0.047	50	\pm 10%	Monocap	85		4.7	35	\pm 20%	Minelect	89	
47,000	47	0.047	50	-20+50%	Disc	86		4.7	35	\pm 20%	Tant	89	
47,000	47	0.047	100	\pm 10%	Monores	85		4.7	50AC	\pm 15%	Reversolytic	91	
47,000	47	0.047	100	\pm 10%	Mylar	88		4.7	63	\pm 20%	Minelect	89	
47,000	47	0.047	250	\pm 5%	Poly Layer	87		4.7	63	\pm 20%	PC Elect	90	
47,000	47	0.047	250	\pm 20%	Polyester	88		4.7	100	\pm 20%	Axial	90	
47,000	47	0.047	250AC	\pm 20%	IS Cap	88		6.8	16	\pm 20%	Tant	89	
68,000	68	0.068	100	\pm 10%	Monores	85		6.8	35	\pm 20%	Tant	89	
68,000	68	0.068	250	\pm 5%	Poly Layer	87		10	16	\pm 20%	Minelect	89	
68,000	68	0.068	250	\pm 20%	Polyester	88		10	16	\pm 20%	Tant	89	
100,000	100	0.1	12	-20+80%	Minidisc	85		10	25	\pm 20%	Axial	90	
100,000	100	0.1	25	\pm 5%	Polystyrene	87		10	25	\pm 20%	Tant	89	
100,000	100	0.1	35	\pm 20%	Tant	89		10	35	\pm 20%	Tant	89	
100,000	100	0.1	50	\pm 10%	Monocap	85		10	50AC	\pm 15%	Reversolytic	91	
100,000	100	0.1	50	-20+50%	Disc	86		10	50	\pm 20%	Minelect	89	
100,000	100	0.1	63	\pm 20%	Minelect	89		10	50	\pm 20%	PC Elect	90	
100,000	100	0.1	100	\pm 10%	Monores	85		10	63	\pm 20%	Axial	90	
100,000	100	0.1	100	\pm 10%	Mylar	88		10	100	\pm 20%	Axial	90	
100,000	100	0.1	250	\pm 5%	Poly Layer	87		10	100	\pm 20%	PC Elect	90	
100,000	100	0.1	250	\pm 20%	Polyester	88		10	450	-10+50%	Axial	90	
100,000	100	0.1	250AC	\pm 20%	IS Cap	88		22	16	\pm 20%	Minelect	89	
100,000	100	0.1	1000	\pm 10%	HV Cap	88		22	16	\pm 20%	Tant	89	
	120	0.12	250	\pm 5%	Poly Layer	87		22	25	\pm 20%	Axial	90	
	150	0.15	35	\pm 20%	Tant	89		22	25	\pm 20%	PC Elect	90	
	150	0.15	250	\pm 5%	Poly Layer	87		22	25	\pm 20%	Tant	89	
	150	0.15	250	\pm 20%	Polyester	88		22	35	\pm 20%	Minelect	89	
	180	0.18	250	\pm 5%	Poly Layer	87		22	50AC	\pm 15%	Reversolytic	91	
	220	0.22	35	\pm 20%	Tant	89		22	63	\pm 20%	PC Elect	90	
	220	0.22	100	\pm 5%	Poly Layer	87		22	100	\pm 20%	Axial	90	
	220	0.22	100	\pm 10%	Mylar	88		33	10	\pm 20%	Tant	89	

pF	nF	μF	Voltage (DC)	Tolerance	Type	Page	pF	nF	μF	Voltage (DC)	Tolerance	Type	Page
		33	25	±20%	Axial	90	470	25	±20%	PC Elect			90
		33	50AC	±15%	Reversolytic	91	470	63	±20%	Axial			90
		33	63	±20%	Axial	90	470	63	±20%	PC Elect			90
		47	10	±20%	Tant	89	680	40	-10+50%	Axial			90
		47	16	±20%	Axial	90	1000	10	±20%	Axial			90
		47	16	±20%	Minelect	89	1000	16	±20%	Axial			90
		47	16	±20%	Tant	89	1000	16	±20%	PC Elect			90
		47	25	±20%	PC Elect	90	1000	35	±20%	Axial			90
		47	50AC	±15%	Reversolytic	91	1000	35	±20%	PC Elect			90
		47	63	±20%	Axial	90	1000	63	±20%	Axial			90
		47	63	±20%	PC Elect	90	1000	100	-10+50%	Can			91
		47	100	±20%	Axial	90	1500	6.3	-10+50%	Axial			90
		47	450	±20%	Axial	90	1500	10	-10+50%	Axial			90
		68	16	-10+50%	Axial	90	2200	10	±20%	Axial			90
		100	3	±20%	Tant	89	2200	16	±20%	PC Elect			90
		100	6.3	±20%	Minelect	89	2200	35	±20%	Axial			90
		100	10	±20%	Axial	90	2200	50	-10+50%	Can			91
		100	10	±20%	PC Elect	90	2200	50	±20%	Axial			90
		100	10	±20%	Tant	89	2200	63	-10+50%	Can			91
		100	16	±20%	Minelect	89	2200	63	±20%	Axial			90
		100	25	±20%	PC Elect	90	3300	10	±20%	Axial			90
		100	35	±20%	Axial	90	3300	25	±20%	Axial			90
		100	50AC	±15%	Reversolytic	91	3300	50	-10+50%	Can			91
		100	50	±20%	Axial	90	3300	63	-10+50%	Can			91
		100	63	±20%	Axial	90	4700	10	±20%	Axial			90
		100	63	±20%	PC Elect	90	4700	16	±20%	PC Elect			90
		100	100	±20%	Axial	90	4700	25	-10+50%	Can			91
		100	250	-10+50%	Axial	90	4700	35	±20%	Axial			90
		150	6.3	-10+50%	Axial	90	4700	50	-10+50%	Can			91
		150	25	-10+50%	Axial	90	4700	50	±20%	Axial			90
		220	10	±20%	Axial	90	4700	63	-10+50%	Can			91
		220	16	±20%	Axial	90	4700	63	±20%	Audio			92
		220	16	±20%	PC Elect	90	4700	80	±20%	Audio			92
		220	35	±20%	Axial	90	4700	100	-10+50%	Can			91
		220	50	±20%	Axial	90	6800	50	-10+50%	Can			91
		220	63	±20%	Axial	90	10,000	25	-10+50%	Can			91
		220	63	±20%	PC Elect	90	10,000	63	-10+50%	Can			91
		330	10	±20%	Axial	90	10,000	63	±20%	Audio			92
		330	25	±20%	Axial	90	10,000	80	-10+50%	Can			91
		470	10	±20%	Axial	90	10,000	80	±20%	Audio			92
		470	16	±20%	Axial	90	22,000	56	±20%	Audio			92
		470	16	±20%	PC Elect	90	22,000	63	-10+50%	Can			91
		470	25	±20%	Axial	90	47,000	50	-10+50%	Can			91
							1F	5.5	-20+40%	Memcap			92

Capacitor Markings

Some of the capacitors we sell are marked using three digits and a letter. The three digits denote the value and the third digit indicates the tolerance. The first two digits are the actual value and the third digit indicates the number of zeros that follow the value, and the value is printed in picoFarads. For example a capacitor marked 102 has a value of 10 plus 2 zeros, which is 1000pF (1000pF = 0.001μF). The letter indicates the tolerance as follows: F = ±1%, G = ±2%, H = ±2½%, J = ±5%, K = ±10%, M = ±20%.

CERAMIC CAPACITORS Metallised Ceramic Plate Capacitors

A miniature ceramic capacitor with a hard lacquer casing. Values up to and including 330pF are suitable for temperature compensation in tuned circuits where low losses, close tolerance and high stability are required. Values from 390pF to 4700pF are for use in coupling and decoupling applications, where a non-linear change of capacitance with temperature is permissible. Values 10,000pF and 22,000pF are suitable for use in coupling and decoupling applications, where capacitance stability is not critical.

Insulation resistance: >1000MΩ
Temperature coefficient:

1.8 to 18pF:	Zero:	Black
22pF to 150pF:	-150ppm/°C:	Orange
180pF to 330pF:	-750ppm/°C:	Violet
390pF to 4700pF:	medium K:	Yellow
10,000pF to 22,000pF:	high K:	Green

Colour indicates colour band marked on capacitor.

Power factor:

1.8pF to 47pF:	<55x10 ⁻⁴
56pF to 330pF:	<15x10 ⁻⁴
390pF to 4700pF:	<350x10 ⁻⁴
10,000pF to 22,000pF:	<650x10 ⁻⁴

Case size	Width max mm	Height max mm
1	3.6	5.0
2A	3.9	5.3
2B	4.5	6.0
3	5.1	6.6
4	6.2	7.7
5	6.2	9.9

Thickness of body: 2.3mm max.
Lead spacing: 2.54mm.
Lead length: 13mm min.



Capacitance (pF)	Voltage (DC)	Case Size	Tolerance
1.8	100	1	±0.25pF
2.2	100	1	"
2.7	100	1	"
3.3	100	1	"
3.9	100	1	"
4.7	100	1	"
5.6	100	1	"
6.8	100	1	"
8.2	100	1	"
10	100	1	±2%
12	100	1	"
15	100	1	"
18	100	1	"
22	100	1	"
27	100	1	"
33	100	1	"
39	100	2A	"
47	100	2A	"
56	100	2B	"
68	100	2B	"
82	100	3	"
100	100	3	"
120	100	4	"
150	100	4	"
180	100	4	"
220	100	4	"
270	100	5	"
330	100	5	"

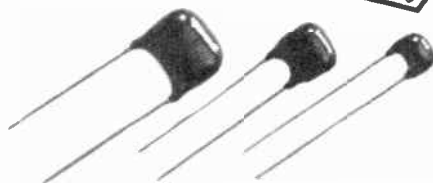
Capacitance (pF)	Voltage (DC)	Case Size	Tolerance
390	100	1	±10%
470	100	1	"
560	100	1	"
680	100	1	"
820	100	1	"
1000	100	2A	"
1200	100	2A	"
1500	100	2B	"
1800	100	2B	"
2200	100	3	"
2700	100	3	"
3300	100	4	"
3900	100	4	"
4700	100	4	"
10,000	63	2B	-20%+80%
22,000	63	4	"

Order

WX35Q (Ceramic 1.8)	4p
WX36P (Ceramic 2.2)	4p
WX37S (Ceramic 2.7)	4p
WX38R (Ceramic 3.3)	4p
WX39N (Ceramic 3.9)	4p
WX40T (Ceramic 4.7)	4p
WX41U (Ceramic 5.6)	4p
WX42V (Ceramic 6.8)	4p
WX43W (Ceramic 8.2)	4p
WX44X (Ceramic 10)	4p
WX45Y (Ceramic 12)	4p
WX46A (Ceramic 15)	4p
WX47B (Ceramic 18)	4p
WX48C (Ceramic 22)	4p
WX49D (Ceramic 27)	4p
WX50E (Ceramic 33)	4p
WX51F (Ceramic 39)	4p
WX52G (Ceramic 47)	4p
WX53H (Ceramic 56)	5p
WX54J (Ceramic 68)	5p
WX55K (Ceramic 82)	5p
WX56L (Ceramic 100)	6p
WX57M (Ceramic 120)	7p
WX58N (Ceramic 150)	7p
WX59P (Ceramic 180)	7p
WX60Q (Ceramic 220)	7p
WX61R (Ceramic 270)	7p
WX62S (Ceramic 330)	7p
WX63T (Ceramic 390)	7p
WX64U (Ceramic 470)	7p
WX65V (Ceramic 560)	7p
WX66W (Ceramic 680)	7p
WX67X (Ceramic 820)	7p
WX68Y (Ceramic 1000)	7p
WX69A (Ceramic 1200)	7p
WX70M (Ceramic 1500)	7p
WX71N (Ceramic 1800)	7p
WX72P (Ceramic 2200)	7p
WX73Q (Ceramic 2700)	7p
WX74R (Ceramic 3300)	7p
WX75S (Ceramic 3900)	7p
WX76H (Ceramic 4700)	7p
WX77J (Ceramic 10,000)	7p
WX78K (Ceramic 22,000)	7p

MONOLITHIC CERAMIC CAPACITORS Resin-Dipped

NEW



A high quality multilayer resin-dipped plate ceramic capacitor, offering a very high capacitance in a very small case at a very economical price. Applications include coupling, decoupling and filtering.

Tolerance:	10pF to 220pF:	±5%
	470pF to 0.1µF:	±10%
	0.22µF to 0.47µF:	±20%
Insulation resistance:	>10 ¹¹ or 10 ⁹ divided by µF (whichever is less)	
Power factor:	10pF to 220pF:	<0.1%
	470pF to 0.1µF:	<2.5%
	0.22µF to 0.47µF:	<3%
Temperature coefficient:	10pF to 220pF: ±30ppm/°C (COG)	
	470pF to 0.1µF: ±15% (X7R) max frbm -55°C to +125°C	
	0.22µF to 0.47µF: +22% -56% (Z5U) max from -25°C to +85°C	
Case size:	(H x W x T)	Lead pitch
10pF to 0.0047µF:	3.8 x 3.8 x 2.5mm	2.54mm
0.0068µF to 0.033µF:	5.1 x 5.1 x 3.1mm	2.54mm
0.047µF to 0.47µF:	7.6 x 7.6 x 3.8mm	5.08mm

The following values are available:

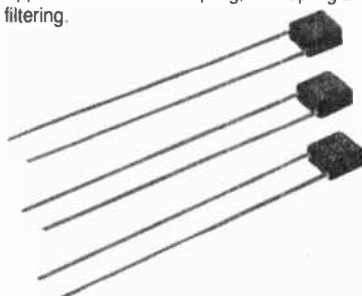
Value	Voltage	Marking
10pF	100V	100J1C
22pF	100V	220J1C
47pF	100V	470J1C
100pF	100V	101J1C
220pF	100V	221J1C
470pF	100V	471K1D
0.001µF	100V	102K1D
0.0022µF	100V	222K1D
0.0033µF	100V	332K1D
0.0047µF	100V	472K1D
0.0068µF	100V	682K1D
0.01µF	100V	103K1D
0.022µF	100V	223K1D
0.033µF	100V	333K1D
0.047µF	100V	473K1D
0.068µF	100V	683K1D
0.1µF	100V	104K1D
0.22µF	100V	224M1F
0.33µF	50V	334M5F
0.47µF	50V	474M5F

Order

RA33L (Monores Cap 10pF)	14p
RA34M (Monores Cap 22pF)	14p
RA35Q (Monores Cap 47pF)	14p
RA36P (Monores Cap 100pF)	14p
RA37S (Monores Cap 220pF)	14p
RA38R (Monores Cap 470pF)	14p
RA39N (Monores Cap 1000pF)	14p
RA40T (Monores Cap 2200pF)	14p
RA41U (Monores Cap 3300pF)	14p
RA42V (Monores Cap 4700pF)	16p
RA43W (Monores Cap 6800pF)	17p
RA44X (Monores Cap 0.01µF)	20p
RA45Y (Monores Cap 0.022µF)	22p
RA46A (Monores Cap 0.033µF)	22p
RA47B (Monores Cap 0.047µF)	28p
RA48C (Monores Cap 0.068µF)	30p
RA49D (Monores Cap 0.1µF)	40p
RA50E (Monores Cap 0.22µF)	54p
RA51F (Monores Cap 0.33µF)	55p
RA52G (Monores Cap 0.47µF)	90p

Epoxy Cased Types

A very high quality plate ceramic capacitor in a rugged moulded epoxy case. These capacitors offer very high capacitance in a very small case size. Applications include coupling, decoupling and filtering.



Tolerance:	±10%
Insulation resistance:	>10 ¹¹ Ω
Power factor:	2.5%
Temperature coefficient:	±15% (X7R)
Case size:	5 x 5 x 2.5mm
Lead pitch:	5mm

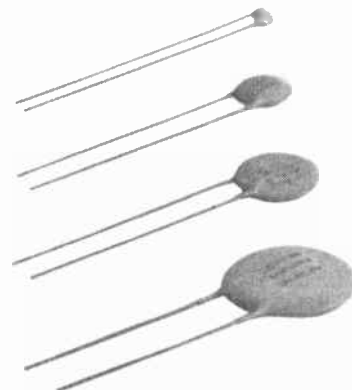
The following values are available:

Value (µF)	Voltage (V)	Marking
0.001	200	05BX102K
0.0022	100	05BX222K
0.0047	100	05BX472K
0.01	100	05BX103K
0.022	50	05BX223K
0.047	50	05BX473K
0.1	50	05BX104K

Order

YY24B (Monocap 0.001µF)	32p
YY25C (Monocap 0.0022µF)	32p
YY07H (Monocap 0.0047µF)	32p
YY08J (Monocap 0.01µF)	36p
YY09K (Monocap 0.022µF)	42p
YY10L (Monocap 0.047µF)	48p
YY11M (Monocap 0.1µF)	54p

Miniature Disc Ceramic



A general purpose ceramic disc capacitor having a large capacitance in a very small case size.

Working voltage:

0.01µF:	12V DC
0.047µF:	12V DC
0.1µF:	16V DC
0.47µF:	12V DC
Tolerance:	+80 - 20%
Power factor:	<0.07

Value (µF)	Diameter (mm)	Thickness (mm)	Lead Pitch (mm)
0.01	5.0	2.0	2.5
0.047	5.3	2.5	3.0
0.1	8.0	2.0	5.0
0.47	14.7	2.5	6.0

Order

YR73Q (Minidisc 0.01µF)	6p
YR74R (Minidisc 0.047µF)	8p
YR75S (Minidisc 0.1µF)	10p
YR76H (Minidisc 0.47µF)	16p

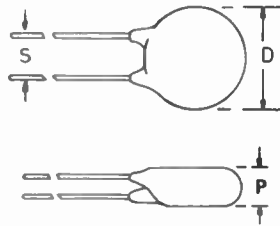
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Low Voltage Disc Ceramic

A standard general purpose ceramic disc capacitor, cement coated. Available in four values.



Insulation resistance: >5000MΩ
 Working Voltage: 40V DC
 Tolerance: +80-20%
 Power factor: <0.05

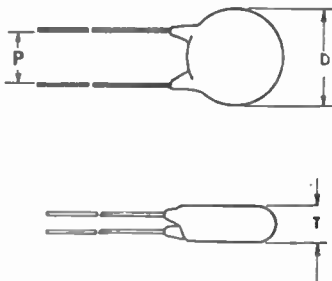
Value μF	Diameter (mm)	Thickness (mm)	Lead Pitch (mm)
0.01	5.5	2.0	5.0
0.022	8.0	2.5	5.5
0.047	10.5	3.0	5.5
0.1	14.0	3.0	10

Order

BX00A (Disc 0.01uF)	6p
BX01B (Disc 0.022uF)	6p
BX02C (Disc 0.047uF)	6p
BX03D (Disc 0.1uF)	6p

High Voltage Disc Ceramic

A 500V standard disc ceramic capacitor for general purpose use.



Working voltage: 500V DC, 250V AC 50Hz
 Insulation resistance: >7.5x10⁹Ω
 Case sizes: 10pF to 2200pF: D:7.4;T:<4;P:5
 4700pF and 10,000pF: D:15;T:<4;P:7.5

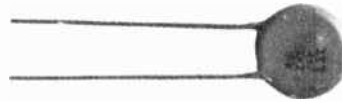
Value (pF)	Tolerance	Temperature coefficient	Power factor
10	±10%	Zero	<26x 10 ⁻⁴
100	±10%	-3300ppm/°C	<40x10 ⁻⁴
470	±20%	Hi-K	<250x10 ⁻⁴
680	±20%	Hi-K	<250x10 ⁻⁴
1000	±20%	Hi-K	<250x10 ⁻⁴
2200	-20+40%	Hi-K	<250x10 ⁻⁴
4700	-20+40%	Hi-K	<250x10 ⁻⁴
10,000	-20+40%	Hi-K	<250x10 ⁻⁴

Order

BX05F (HV Disc 10)	8p
BX07H (HV Disc 100)	8p
BX10L (HV Disc 470)	8p
BX11M (HV Disc 680)	8p
BX12N (HV Disc 1000)	8p
BX13P (HV Disc 2200)	8p
BX14Q (HV Disc 4700)	12p
BX15R (HV Disc 10,000)	12p

1000V Disc Ceramic

A 1000V disc ceramic capacitor for general purpose use.



Working voltage: 1000V DC
 Insulation resistance: 7.5 x 10⁹Ω
 Tolerance: -20 + 40%
 Temperature coefficient: Hi-K
 Power factor: <250 x 10⁻⁴
 Case size: D:15mm;
 T:<5mm;
 P: 7.5mm
 Case style: Same as HV Disc

Available in one value only: 4700pF

Order

HY18U (1000V Disc 4700pF)	48p
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Feed Through Capacitor



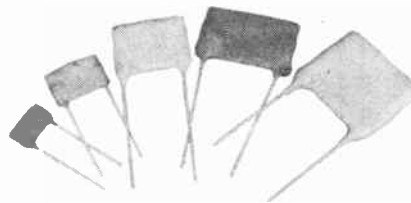
Feed through capacitor 1000pF 350V DC miniature, tubular solder-in construction. Body dimensions 9.4 x 3mm.

Order

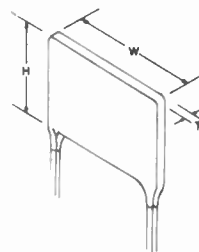
BX16S (Feed Thro Cap)	10p
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SILVERED MICA

A capacitor featuring high stability for use in tuned circuits, and filters and for pulse operation. It has a solid wax impregnant with a tough cement coating.



Tolerance: 5pF to 47pF ±0.5pF
 68pF to 4700pF ±1%
 Working voltage: 350V DC
 Insulation resistance: 50,000MΩ
 Temperature coefficient: 5pF to 47pF: +75ppm/°C
 68pF to 4700pF: +35ppm/°C
 Power Factor: 5pF to 47pF: <25x 10⁻⁴
 68pF to 680pF: <15x10⁻⁴
 1000pF and 4700pF: <20x10⁻⁴



Case sizes	W	H	T
5pF to 68pF	13	8	3.2
100pF to 220pF	17	12	3.2
330pF to 470pF	27	17	3.2
680pF to 4700pF	27	22	3.2

The following values are available (pF): 5, 10, 22, 33, 47, 68, 100, 120, 150, 180, 220, 330, 470, 680, 1000 and 4700.

Order

WX02C (Mica 5pF)	17p
WX03D (Mica 10pF)	17p
WX05F (Mica 22pF)	17p
WX07H (Mica 33pF)	17p
WX09K (Mica 47pF)	17p
WX11M (Mica 68pF)	17p
WX13P (Mica 100pF)	19p
WX14Q (Mica 120pF)	19p
WX15R (Mica 150pF)	19p
WX16S (Mica 180pF)	19p
WX17T (Mica 220pF)	20p
WX19V (Mica 330pF)	28p
WX21X (Mica 470pF)	28p
WX23A (Mica 680pF)	31p
WX25C (Mica 1000pF)	37p
WX31J (Mica 4700pF)	82p

POLYSTYRENE



A high grade polystyrene foil capacitor. The extended foil construction achieves low self-inductance, low high frequency losses and long life. A red band indicates the lead connected to the outer foil which completely shields the inner foil. A fused polystyrene enclosure ensures high insulation resistance. The capacitors are suitable for computing circuits, coupling, filters, tuned circuits and applications requiring low losses at high frequencies, stability and reliability.

Tolerance: ±5%
 Working voltage: 160V DC (22pF to 10,000pF)
 63V DC (22,000pF to 100,000pF)

Insulation resistance: >10¹¹Ω
 Temperature coefficient: -160±80ppm/°C
 Power factor: <5 x 10⁻⁴ @ 1MHz
 Inductance: <30nH

The following values are available:

Value(pF)	Case Size (mm)	
	Diameter	Length
22	4.4	8
33	4.4	8
47	4.7	8
68	4.2	8
100	3.9	8
150	4.3	8
220	4.5	8
330	4.8	8
470	5.3	8
560	5.4	8
680	5.8	12
1,000	6.2	12
1,500	6.8	12
2,200	7.4	12
3,300	8.6	12

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Value (pF)	Case Size (mm)	
	Diameter	Length
4,700	8.5	17
5,600	8.0	22
6,800	8.5	22
10,000	9.7	22
22,000	11.8	32
47,000	12.2	22
100,000	17.0	22

Order		
BX24B (Polystyrene 22)		15p
BX25C (Polystyrene 33)		15p
BX26D (Polystyrene 47)		10p
BX27E (Polystyrene 68)		10p
BX28F (Polystyrene 100)		10p
BX29G (Polystyrene 150)		10p
BX30H (Polystyrene 220)		10p
BX31J (Polystyrene 330)		10p
BX32K (Polystyrene 470)		10p
BX33L (Polystyrene 560)		10p
BX34M (Polystyrene 680)		10p
BX35Q (Polystyrene 1000)		10p
BX36P (Polystyrene 1500)		10p
BX37S (Polystyrene 2200)		10p
BX38R (Polystyrene 3300)		10p
BX39N (Polystyrene 4700)		14p
BX40T (Polystyrene 5600)		14p
BX41U (Polystyrene 6800)		16p
BX92A (Polystyrene 10,000)		16p
BX93B (Polystyrene 22,000)		18p
BX94C (Polystyrene 47,000)		28p
BX95D (Polystyrene 100,000)		54p

Close Tolerance Polystyrene



A polystyrene film and tin/lead foil capacitor using extended techniques, resulting in low inherent inductance and low series resistance. This combined with low temperature coefficient, makes these capacitors suitable for use in professional and general purpose applications where precision, reliability, stability and low losses are of prime importance, e.g. in tuned circuits, filter networks, discriminators etc.

Tolerance: $\pm 1\%$
 Working voltage: 100pF to 470pF: 500V DC, 220V AC 50Hz
 560pF to 820pF: 125V DC, 63V AC 50Hz
 10,000pF and 22,000pF: 63V DC

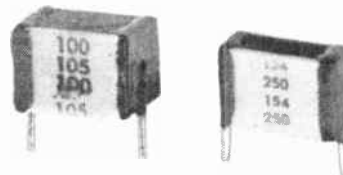
Insulation resistance: $> 10^{11} \Omega$
 Temperature coefficient: $-150 \pm 60 \text{ ppm}/^\circ\text{C}$
 Power factor: $< 2 \times 10^{-4}$ at 1kHz
 $< 5 \times 10^{-4}$ at 1MHz

Value (pF)	Case size (mm)	
	L (max)	D (max)
100	10.5	3.5
150	10.5	3.5
220	10.5	3.5
270	10.5	3.5
330	10.5	4
390	10.5	4.5
470	10.5	4.5
560	10.5	3.5
750	10.5	3.5
1,000	10.5	3.5
1,200	10.5	4
1,500	10.5	4
1,800	10.5	4.5

Value (pF)	Case size (mm)	
	L (max)	D (max)
2,200	10.5	5
2,700	10.5	5
3,300	10.5	5.5
3,900	10.5	6
4,700	15	5.5
5,600	15	5.5
6,800	15	6
8,200	15	6.5
10,000	15	5.5
22,000	15	7

Order		
BX46A (1% Polysty 100)		24p
BX47B (1% Polysty 150)		24p
BX49D (1% Polysty 220)		24p
BX50E (1% Polysty 270)		24p
BX51F (1% Polysty 330)		24p
BX52G (1% Polysty 390)		24p
BX53H (1% Polysty 470)		24p
BX54J (1% Polysty 560)		24p
BX55K (1% Polysty 750)		24p
BX56L (1% Polysty 1000)		24p
BX57M (1% Polysty 1200)		24p
BX58N (1% Polysty 1500)		24p
BX59P (1% Polysty 1800)		24p
BX60Q (1% Polysty 2200)		24p
BX61R (1% Polysty 2700)		24p
BX62S (1% Polysty 3300)		24p
BX63T (1% Polysty 3900)		24p
BX64U (1% Polysty 4700)		30p
BX65V (1% Polysty 5600)		30p
BX66W (1% Polysty 6800)		30p
BX85G (1% Polysty 8200)		30p
BX86T (1% Polysty 10,000)		30p
BX87U (1% Polysty 22,000)		35p

POLYESTER Polyester Layer



A self-healing layer capacitor with a polyethylene-terephthalate dielectric. Designed specifically for use on printed circuit boards, they offer high values of capacitance in extremely small case sizes and they have low inductance and low loss characteristics.

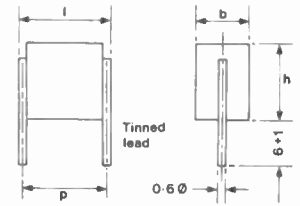
Tolerance: 0.001 μ F to 0.01 μ F: $\pm 10\%$
 0.015 μ F to 1 μ F: $\pm 5\%$

Working voltage: 0.001 μ F to 0.01 μ F: 400V DC
 160V AC rms 50Hz
 0.015 μ F to 0.18 μ F: 250V DC
 100V AC rms 50Hz
 0.22 μ F to 1 μ F 100V DC
 55V AC rms 50Hz

Insulation resistance: 0.001 μ F to 0.33 μ F: $> 7.5 \times 10^{10} \Omega$ ave.
 0.39 μ F to 1 μ F: $> 2.5 \times 10^{10} \Omega$ ave

Self-inductance: 6nH approx.
 Power factor: $< 8 \times 10^{-3}$ at 1kHz
 Temp coefficient: 200ppm/°C ave.

Value (μ F)	Case size			
	l max	b max	h max	p max
0.001	9	2.4	8.2	7.5
0.0015	9	2.3	8.2	7.5
0.0022	9	2.3	8.2	7.5
0.0033	9	2.3	8.2	7.5
0.0047	9	2.3	8.2	7.5



Dimensions in mm

Value (μ F)	Case size			
	l max	b max	h max	p max
0.0068	9	2.4	7.3	7.5
0.0082	9	2.4	7.3	7.5
0.01	9	2.4	7.3	7.5
0.015	9	2.3	7.3	7.5
0.018	9	2.3	7.3	7.5
0.022	9	2.5	7.3	7.5
0.027	9	2.4	7.3	7.5
0.033	9	2.5	7.3	7.5
0.039	9	2.9	7.3	7.5
0.047	9	2.9	7.4	7.5
0.068	9	3.6	8.1	7.5
0.1	9	4.0	10.1	7.5
0.12	11.5	4.2	7.7	10
0.15	11.5	4.3	8.5	10
0.18	11.5	4.6	10.1	10
0.22	11.5	3.4	7.2	10
0.27	9	5	11.5	8.4
0.33	9	5.5	11.5	8.8
0.39	9	5.5	11.5	7.5
0.47	9	5.5	12.5	7.5
0.56	9	6.5	12.5	7.5
0.68	9	8	13	11.4
1	11.5	8.5	9.8	10

Order

WW22Y (Poly Layer 0.001)	12p
WW23A (Poly Layer 0.0015)	12p
WW24B (Poly Layer 0.0022)	12p
WW25C (Poly Layer 0.0033)	12p
WW26D (Poly Layer 0.0047)	12p
WW27E (Poly Layer 0.0068)	12p
WW28F (Poly Layer 0.0082)	12p
WW29G (Poly Layer 0.01)	12p
WW31J (Poly Layer 0.015)	12p
WW32K (Poly Layer 0.018)	12p
WW33L (Poly Layer 0.022)	12p
WW34M (Poly Layer 0.027)	12p
WW35Q (Poly Layer 0.033)	12p
WW36P (Poly Layer 0.039)	12p
WW37S (Poly Layer 0.047)	12p
WW39N (Poly Layer 0.068)	14p
WW41U (Poly Layer 0.1)	15p
WW42V (Poly Layer 0.12)	16p
WW43W (Poly Layer 0.15)	16p
WW44X (Poly Layer 0.18)	17p
WW45Y (Poly Layer 0.22)	17p
WW46A (Poly Layer 0.27)	18p
WW47B (Poly Layer 0.33)	19p
WW48C (Poly Layer 0.39)	21p
WW49D (Poly Layer 0.47)	23p
WW50E (Poly Layer 0.56)	25p
WW51F (Poly Layer 0.68)	26p
WW53H (Poly Layer 1)	28p

PHONE NOW 0702 552911



Access, Visa, American Express, Mapcard.
 Phone before 2pm for same day despatch.

Metallised Polyester Film

These capacitors consist of a low-inductive wound cell of metallised (PETP) film. This is protected by a hard, water repellent, solvent resistant and flame retardant orange epoxy. Designed for use on PCB's for coupling and decoupling applications, the radial leads are solder-dipped copper wire cropped to 5mm. All capacitors are marked in black ink on the top as follows: 1st line: Rated capacitance in pF or μF , and tolerance, K = 10%, M = 20% 2nd line: Rated voltage (DC) and code for dielectric material (MKT = metallised PETP film).



Operating Temperature Range is -40°C to $+100^{\circ}\text{C}$

Insulation resistance: 0.01 μF to 0.33 μF : $>3 \times 10^{10}\Omega$
 0.47 μF to 2.2 μF : $>5 \times 10^9\Omega$
 Temperature coefficient: 333ppm/ $^{\circ}\text{C}$ ave.
 Power factor: $<130 \times 10^{-4}$ at 1kHz

Value (μF)	Case size (mm)			Working VDC	Lead spacing
	T	H	L		
0.01	4.0	12	12.5	400	10.0
0.015	4.0	12	12.5	400	10.0
0.022	4.0	12	12.5	400	10.0
0.033	4.0	12	12.5	250	10.0
0.047	4.0	12	12.5	250	10.0
0.068	4.5	12.5	12.5	250	10.0
0.1	5.0	13	12.5	250	10.0
0.15	5.0	14	17.5	250	15.0
0.22	6.0	15	17.5	250	15.0
0.33	7.0	16	17.5	250	15.0
0.47	5.5	14.5	17.5	100	15.0
0.68	6.0	15	17.5	100	15.0
1	8.5	17.5	17.5	100	15.0
2.2	6.5	18.5	26.0	100	22.86

Order

BX70M (Polyester 0.01 μF)	6p
BX71N (Polyester 0.015 μF)	6p
BX72P (Polyester 0.022 μF)	6p
BX73Q (Polyester 0.033 μF)	6p
BX74R (Polyester 0.047 μF)	6p
BX75S (Polyester 0.068 μF)	9p
BX76H (Polyester 0.1 μF)	9p
BX77J (Polyester 0.15 μF)	9p
BX78K (Polyester 0.22 μF)	10p
BX79L (Polyester 0.33 μF)	14p
BX80B (Polyester 0.47 μF)	16p
BX81C (Polyester 0.68 μF)	19p
BX82D (Polyester 1 μF)	24p
BX84F (Polyester 2.2 μF)	49p

HIGH VOLTAGE AND INTERFERENCE SUPPRESSION CAPACITORS

Interference Suppression Capacitors



A metallised PETP (polyethylene terephthalate) film and impregnated paper dual dielectric moulded in yellow flame-retardant polypropylene. The capacitors are designed to suppress electrical interference from domestic appliances and should be connected directly across the mains. All types are axial except the 0.033 μF which is radial with lead spacing 15mm.

Tolerance: 0.01 μF to 0.22 μF $\pm 20\%$
 0.47 μF $\pm 10\%$
 Working Voltage: 250V RMS 50 to 60Hz
 Insulation resistance: $>15 \times 10^9\Omega$ @ 20°C
 Power factor: $\leq 130 \times 10^{-4}$ at 10kHz

The following values are available:

Value (μF)	Length (mm)	Height (mm)	Thickness (mm)
0.01	18	10.4	6.5
0.022	18	10.4	6.5
0.033	17.5	11.0	5.0
0.047	18	10.4	6.5
0.1	23.5	11.5	7.8
0.22	23.5	14.5	10.8
0.47	31	19.5	12.5

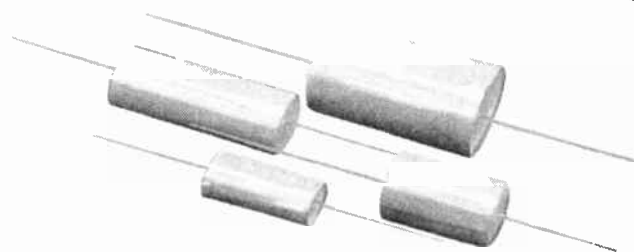


Order

FF53H (IS Cap 0.01 μF)	21p
FF54J (IS Cap 0.022 μF)	22p
FT34M (IS Cap 0.033 μF)	24p
FF55K (IS Cap 0.047 μF)	24p
FF56L (IS Cap 0.1 μF)	35p
FF57M (IS Cap 0.22 μF)	47p
FF58N (IS Cap 0.47 μF)	61p

Metallised Polypropylene

NEW



A high quality metallised polypropylene capacitor for use at very high continuous AC or DC voltages. They meet the requirements of BS2135 for Class X or Class Y use at 250V AC mains.

Tolerance: $\pm 10\%$ (K)
 Working voltage: 1000V DC, 500V AC
 Power factor: $<1.5 \times 10^{-3}$ at 1kHz
 Pulse rating: 0.1 μF and 0.22 μF 70V/ μs max
 0.47 μF and 1 μF 40V/ μs max

The following values are available:

Value	Length (mm)	Dia. max (mm)
0.1 μF	28	15
0.22 μF	28	18
0.47 μF	45	19
1 μF	45	28

Order

FA21X (HV Cap 0.1 μF)	80p
FA22Y (HV Cap 0.22 μF)	98p
FA23A (HV Cap 0.47 μF)	£1.32
FA24B (HV Cap 1 μF)	£1.95

Mylar Film Capacitors

A general purpose capacitor supplementing the other film and foil capacitor ranges in this catalogue.

Tolerance: $\pm 10\%$
 Working voltage: 100V DC

The following values are available:

Value (μF)	Case Size (mm)				
	H	W	T	P	
0.001	10	4.4	3	3.5	
0.0022	10	4.4	3	3.5	
0.0047	10	4.5	3	3.5	
0.01	10	4.5	3	3.5	
0.022	10	6	3.5	5	
0.047	10	8.5	4	6	
0.1	13	10	4.5	6	
0.22	18	12	5	8	

Order

WW15R (Mylar 0.001)	5p
WW16S (Mylar 0.0022)	5p
WW17T (Mylar 0.0047)	5p
WW18U (Mylar 0.01)	5p
WW19V (Mylar 0.022)	5p
WW20W (Mylar 0.047)	5p
WW21X (Mylar 0.1)	6p
WW83E (Mylar 0.22)	7p



TANTALUM BEAD CAPACITORS

A range of resin-dipped solid tantalum bead capacitors featuring very high values of capacitance in an extremely small package.

Tolerance: $\pm 20\%$.

Reverse voltage must not exceed 0.5V (0.3V for 100 μ F 4V).

Leakage current: 0.02 μ A/ μ FV or 1 μ A whichever is greater.

Power factor: <0.1 except 100 μ F which is <0.2.

Lead pitch: 5mm.

The following values are available:

Value (μ F)	Working voltage (DC)	Case size	
		L	D
0.1	35	9	4.5
0.15	35	9	4.5
0.22	35	9	4.5
0.33	35	9	4.5
0.47	35	9	4.5
0.68	35	9	4.5
1.0	35	9	4.5
1.5	35	9.5	5
2.2	35	10	5.5
3.3	35	10.5	5.5
4.7	16	10	5.5
4.7	35	11	5.5
6.8	16	10.5	6.5
6.8	35	11.5	6.5
10	16	11	5.5
10	25	11.5	6.5
10	35	12	7
22	16	12	7
22	25	16.5	8.5
33	10	12	7
47	10	13	7.5
47	16	13	7.5
100	4	12	7
100	10	16.5	8.5



STAR BUY

Order

WW54J (Tant 0.1 μ F 35V)	15p
WW55K (Tant 0.15 μ F 35V)	15p
WW56L (Tant 0.22 μ F 35V)	15p
WW57M (Tant 0.33 μ F 35V)	15p
WW58N (Tant 0.47 μ F 35V)	15p
WW59P (Tant 0.68 μ F 35V)	15p
WW60Q (Tant 1.0 μ F 35V)	15p
WW61R (Tant 1.5 μ F 35V)	17p
WW62S (Tant 2.2 μ F 35V)	19p
WW63T (Tant 3.3 μ F 35V)	24p
WW64U (Tant 4.7 μ F 16V)	17p
WW65V (Tant 4.7 μ F 35V)	23p
WW66W (Tant 6.8 μ F 16V)	23p
WW67X (Tant 6.8 μ F 35V)	47p
WW68Y (Tant 10 μ F 16V)	23p
WW69A (Tant 10 μ F 25V)	47p
WW70M (Tant 10 μ F 35V)	35p
WW72P (Tant 22 μ F 16V)	29p
WW73Q (Tant 22 μ F 25V)	95p
WW74R (Tant 33 μ F 10V)	47p
WW75S (Tant 47 μ F 10V)	68p
WW76H (Tant 47 μ F 16V)	70p
WW78K (Tant 100 μ F 4V)	65p
WW79L (Tant 100 μ F 10V)	£1.15

ELECTROLYTIC CAPACITORS

Sub-Miniature Single-Ended Electrolytics

A range of sub-miniature capacitors offering size, tolerance and leakage current similar to tantalum bead. Designed for direct mounting on pcb's.

Tolerance: $\pm 20\%$

Cap (μ F)	Working Voltage (DC)	l (mm)	Case Size d (mm)	p (mm)	Leakage Current: (μ A max)	Power Factor (max)
0.1	63	7.5	4.25	1.5	3	0.09
0.47	63	7.5	4.25	1.5	3	0.09
1	63	7.5	4.25	1.5	3	0.09
2.2	63	7.5	4.25	1.5	3	0.09
4.7	35	7.5	4.25	1.5	3	0.13
4.7	63	7.5	6.5	2.5	3	0.09
10	16	7.5	4.25	1.5	3	0.17
10	50	7.5	6.5	2.5	5	0.1



STAR BUY

Cap (μ F)	Working Voltage (DC)	l (mm)	Case Size d (mm)	p (mm)	Leakage Current (μ A max)	Power Factor (max)
22	16	8	5.25	2	3.5	0.17
22	35	7.5	6.5	2.5	7.7	0.13
47	16	8	6.3	2.5	7.5	0.17
100	6.3	8.5	6.3	2.5	6.3	0.25
100	16	7.5	6.5	2.5	16	0.17

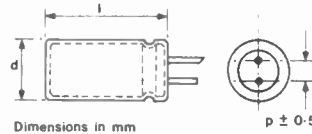
Order

YY29G (Minelect 0.1 μ F 63V)	10p
YY30H (Minelect 0.47 μ F 63V)	10p
YY31J (Minelect 1 μ F 63V)	10p
YY32K (Minelect 2.2 μ F 63V)	10p
YY33L (Minelect 4.7 μ F 35V)	9p
RA53H (Minelect 4.7 μ F 63V)	10p
YY34M (Minelect 10 μ F 16V)	9p
YY35Q (Minelect 10 μ F 50V)	10p
YY36P (Minelect 22 μ F 16V)	10p
RA54J (Minelect 22 μ F 35V)	10p
YY37S (Minelect 47 μ F 16V)	10p
RK50E (Minelect 100 μ F 6.3V)	9p
RA55K (Minelect 100 μ F 16V)	12p

Single-Ended Electrolytics

A range of small electrolytic capacitors designed for direct mounting on printed circuit boards.

Tolerance: $\pm 20\%$



STAR BUY

Cap (μ F)	Working Voltage (DC)	Case Size l	d	p	Ripple Current (mA max) @ 120Hz 85°C	Leakage Current (μ A max)	Power Factor (max)
0.47	100	11	5	2	10	3	0.08
1	100	11	5	2	15	3	0.08
2.2	100	11	5	2	25	3	0.08
4.7	63	11	5	2	35	3	0.09
10	50	11	5	2	50	5	0.1
10	100	11.5	8	3.5	70	10	0.08
22	25	11	5	2	60	5.5	0.14
22	63	11.5	8	3.5	100	13.9	0.09
47	25	11	6.3	2.5	100	11.8	0.14
47	63	12.5	10	5	165	29.6	0.09
100	10	11	6.3	2.5	120	10	0.2
100	25	11.5	8	3.5	165	25	0.14
100	63	20	10	5	285	63	0.09
220	16	12.5	10	5	265	35.2	0.16
220	63	20	12.5	5	470	138.6	0.09
470	16	20	10	5	460	75.2	0.16
470	25	20	12.5	5	550	117.5	0.14
470	63	25	16	7.5	840	296.1	0.09
1000	16	25	12.5	5	810	160	0.16
1000	35	25	16	7.5	1050	350	0.12
2200	16	25	16	7.5	1350	352	0.19
4700	16	35.5	18	7.5	2400	752	0.24

Continued on next page.

Choosing an Electrolytic to Suit Your Needs

Since all electrolytic capacitors have a wide tolerance, one of the capacitors here will suffice in most cases where an electrolytic is specified. Choose the nearest value to the one specified, and the nearest voltage equal to or above the one specified, e.g. 50 μ F at 50V specified, nearest value 47 μ F; and 100V is the nearest voltage above. Thus a 47 μ F at 100V will perform exactly the same job as a 50 μ F at 50V, providing that its physical size is not too large.

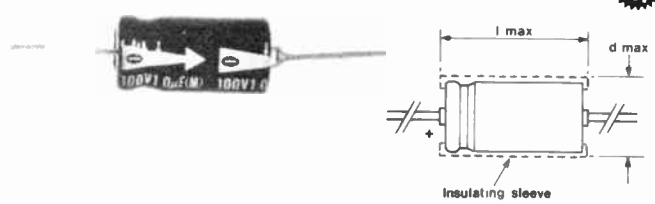
Single-Ended Electrolytics (continued)

Order		
FF00A	(PC Elect 0.47uF 100V)	7p
FF01B	(PC Elect 1uF 100V)	7p
FF02C	(PC Elect 2.2uF 100V)	8p
FF03D	(PC Elect 4.7uF 63V)	8p
FF04E	(PC Elect 10uF 50V)	9p
FF05F	(PC Elect 10uF 63V)	11p
FF06G	(PC Elect 22uF 16V)	8p
FF07H	(PC Elect 22uF 63V)	11p
FF08J	(PC Elect 47uF 25V)	9p
FF09K	(PC Elect 47uF 63V)	12p
FF10L	(PC Elect 100uF 10V)	8p
FF11M	(PC Elect 100uF 25V)	11p
FF12N	(PC Elect 100uF 63V)	20p
FF13P	(PC Elect 220uF 16V)	12p
FF14Q	(PC Elect 220uF 63V)	32p
FF15R	(PC Elect 470uF 16V)	20p
FF16S	(PC Elect 470uF 25V)	28p
FF59P	(PC Elect 470uF 63V)	48p
FF17T	(PC Elect 1000uF 16V)	24p
FF18U	(PC Elect 1000uF 35V)	39p
FF60Q	(PC Elect 2200uF 16V)	42p
FM83E	(PC Elect 4700uF 16V)	64p

Cap (uF)	Working Voltage (DC)	I (max)	Case Size d (max)	Ripple Current (mA max) @ 120Hz 85°C	Tolerance (%)	Leakage Current (uA max)	Power Factor (max)
470	25	25	10	600	±20	117.5	0.14
470	63	31.5	12.5	890	±20	297	0.09
680	40	30.5	15.5	600	-10+50	836	0.1
1000	10	25	10	733	±20	100	0.2
1000	16	25	12.5	940	±20	160	0.16
1000	35	31.5	12.5	1190	±20	350	0.12
1000	63	40	16	1660	±20	630	0.09
1500	6.3	30.5	10.5	635	-10+50	304	0.25
1500	10	30.5	13	845	-10+50	470	0.18
2200	10	31.5	12.5	1300	±20	220	0.23
2200	35	40	16	2080	±20	770	0.15
2200	50	40	22.4	2740	±20	1100	0.13
2200	63	50	22.4	3000	±20	1386	0.12
3300	10	31.5	16	1764	±20	330	0.25
3300	25	40	18	2410	±20	825	0.19
4700	10	40	16	2229	±20	470	0.28
4700	35	50	22.4	3580	±20	1645	0.2
4700	50	50	25	4050	±20	2350	0.18

Axial Lead Electrolytics

A range of miniature, general purpose aluminium electrolytic capacitors, using high etch factor foils to enable wide operating temperatures and high capacitance to be achieved in a miniature can size.

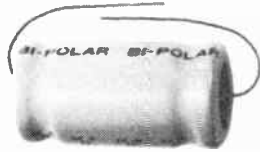


Cap (uF)	Working Voltage (DC)	I (max)	Case Size d (max)	Ripple Current (mA max) @ 120Hz 85°C	Tolerance (%)	Leakage Current (uA max)	Power Factor (max)
0.47	100	12.5	6.3	14	±20	3	0.08
1	100	12.5	6.3	17	±20	3	0.08
2.2	100	12.5	6.3	31	±20	3	0.08
3.3	100	12.5	6.3	38	±20	3.3	0.08
4.7	100	12.5	6.3	46	±20	4.7	0.08
10	25	12.5	6.3	27	±20	3	0.14
10	63	12.5	6.3	60	±20	6.3	0.09
10	100	16	8	85	±20	10	0.08
10	450	31	16	60	-10+50	470	0.25
22	25	12.5	6.3	70	±20	5.5	0.14
22	100	16	8	126	±20	22	0.16
33	25	12.5	6.3	90	±20	8.3	0.14
33	63	16	8	138	±20	20.8	0.16
47	16	12.5	6.3	101	±20	7.6	0.16
47	63	16	8	164	±20	29.7	0.09
47	100	20	10	230	±20	47	0.08
47	450	50	22.4	138	±20	645	0.25
68	16	16	6.3	65	-10+50	22	0.32
100	10	16	8	169	±20	10	0.2
100	35	16	8	220	±20	35	0.12
100	50	20	8	260	±20	50	0.1
100	63	20	10	300	±20	63	0.09
100	100	31.5	10	404	±20	100	0.08
100	250	40	22	300	-10+50	1700	0.25
150	6.3	18.5	6.7	85	-10+50	10	0.3
150	25	18.5	10.3	150	-10+50	27	0.14
220	10	16	8	250	±20	22	0.2
220	16	20	8	310	±20	35.2	0.16
220	35	20	10	410	±20	77	0.12
220	50	25	10	490	±20	110	0.1
220	63	31.5	10	540	±20	138.6	0.09
330	10	20	8	336	±20	33	0.2
330	25	20	10	460	±20	82.5	0.14
470	10	20	10	459	±20	47	0.2
470	16	20	10	510	±20	75.2	0.16

Order

FB11M	(Axial 0.47uF 100V)	8p
FB12N	(Axial 1uF 100V)	8p
FB15R	(Axial 2.2uF 100V)	8p
FB17T	(Axial 3.3uF 100V)	8p
FB18U	(Axial 4.7uF 100V)	10p
FB22Y	(Axial 10uF 25V)	8p
FB23A	(Axial 10uF 63V)	11p
FB24B	(Axial 10uF 100V)	16p
FB25C	(Axial 10uF 450V)	54p
FB30H	(Axial 22uF 25V)	8p
FB31J	(Axial 22uF 100V)	16p
FB35Q	(Axial 33uF 25V)	10p
FB36P	(Axial 33uF 63V)	12p
FB38R	(Axial 47uF 16V)	8p
FB39N	(Axial 47uF 63V)	15p
FB42V	(Axial 47uF 100V)	28p
FB43W	(Axial 47uF 450V)	£1.20
FB44X	(Axial 68uF 16V)	12p
FB48C	(Axial 100uF 10V)	11p
FB49D	(Axial 100uF 35V)	19p
FB50E	(Axial 100uF 50V)	24p
FB51F	(Axial 100uF 63V)	32p
FB52G	(Axial 100uF 100V)	39p
FB53H	(Axial 100uF 250V)	£1.55
FB54J	(Axial 150uF 6.3V)	18p
FB56L	(Axial 150uF 25V)	18p
FB60Q	(Axial 220uF 10V)	12p
FB61R	(Axial 220uF 16V)	14p
FB62S	(Axial 220uF 35V)	28p
FB63T	(Axial 220uF 50V)	36p
FB64U	(Axial 220uF 63V)	40p
FB67X	(Axial 330uF 10V)	16p
FB68Y	(Axial 330uF 25V)	20p
FB71N	(Axial 470uF 10V)	20p
FB72P	(Axial 470uF 16V)	22p
FB73Q	(Axial 470uF 25V)	28p
FB74R	(Axial 470uF 63V)	45p
FB79L	(Axial 680uF 40V)	54p
FB81C	(Axial 1000uF 10V)	25p
FB82D	(Axial 1000uF 16V)	28p
FB83E	(Axial 1000uF 35V)	45p
FB84F	(Axial 1000uF 63V)	65p
FB85G	(Axial 1500uF 6.3V)	18p
FB86T	(Axial 1500uF 10V)	28p
FB89W	(Axial 2200uF 10V)	42p
FB90X	(Axial 2200uF 35V)	68p
FB91Y	(Axial 2200uF 50V)	98p
FB92A	(Axial 2200uF 63V)	£1.08
FB93B	(Axial 3300uF 10V)	48p
FB94C	(Axial 3300uF 25V)	78p
FB95D	(Axial 4700uF 10V)	54p
FB96E	(Axial 4700uF 35V)	£1.18
RK26D	(Axial 4700uF 50V)	£1.95

Bi-Polarised Electrolytics



A range of bi-polarised electrolytic capacitors.

Tolerance:	±20%
Working voltage 50Hz AC:	50V rms
Max current:	$0.0003142 \times f \times C$ (where f is the frequency in Hz and C is the capacitance in μF)
Power factor:	0.15
Impedance at 10kHz:	1 Ω
Temperature coefficient:	+0.2%/°C
Frequency stability 0.1 to 10kHz:	±4% overall

Value (μF)	Leakage μA	Case size	(mm)
		L	D
1	3	16	6.3
2.2	3.3	17	8
3.3	5	17	8
4.7	7	20	8
10	15	20	8
22	33	25	10
33	50	30	10
47	70	30	10
100	150	30	16

Order

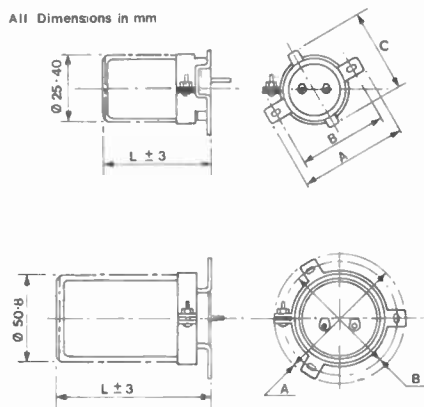
FB97F (Reversolytic 1uF)	28p
FB01B (Reversolytic 2.2uF)	28p
FB02C (Reversolytic 3.3uF)	28p
FB03D (Reversolytic 4.7uF)	28p
FB06G (Reversolytic 10uF)	28p
FB08J (Reversolytic 22uF)	32p
FB09K (Reversolytic 33uF)	34p
FB10L (Reversolytic 47uF)	38p
RK83E (Reversolytic 100uF)	64p

CAN-STYLE ELECTROLYTIC CAPACITORS

Standard Range Can-Type Electrolytics



All Dimensions in mm



A range of can-type electrolytic capacitors employing high gain etched aluminium foil non-inductively wound with electrolytic tissue impregnated with long life electrolyte.

Tolerance: -10% + 50%
Temperature range: -25°C to +85°C

Value (μF)	Working V (DC)	Case size	Ripple current (max) at 100Hz 55°C	Leakage current (max)	Power factor (max)
		L mm D mm (max) (max)			
1000	100	40 25	2.4A	5mA	0.18
2200	50	40 22.4	3.1A	5mA	0.20
2200	63	50 22.4	3.6A	5mA	0.20
3300	50	40 25	4.1A	5mA	0.20
3300	63	50 25	3.3A	6.2mA	0.35

Value (μF)	Working V (DC)	Case size	Ripple current (max) at 100Hz 55°C	Leakage current (max)	Power factor (max)
		L mm D mm (max) (max)			
4700	25	40 22.4	3.8A	5mA	0.30
4700	50	40 30	4.1A	7mA	0.35
4700	63	50 30	4.6A	8.9mA	0.35
4700	100	80 35.5	6.5A	14.1mA	0.30
6800	50	63 30	6.0A	10.2mA	0.35
10,000	25	63 25	6.0A	7.5mA	0.40
10,000	63	80 35.5	8.6A	18.9mA	0.35
10,000	80	90 35.5	9.8A	24mA	0.30
22,000	63	100 40	14.4A	41.6mA	0.35
47,000	50	100 50.8	23.5A	70.5mA	0.35

Ripple currents: Those shown are the maximum allowable at 100Hz, 55°C. The maximum allowable at other frequencies and temperatures is as follows:

50Hz: 95%	120Hz: 100%	1kHz: 110%
10kHz: 130%	20kHz: 133%	
20°C: 140%	40°C: 120%	
70°C: 80%	85°C: 40%	of value shown.

All types are supplied with vertical mounting clips.

Clip dimensions:

Capacitor Dia. (mm)	Fixing Centres (mm)	Overall area (mm)
22.4	35	43 x 24
25	38	48 x 34
30	42	52 x 38
35.5	48	58 x 46
40	54	64 x 50
50.8	65 dia.	74.5 dia.

Order

FF19V (Can 1000uF 100V)	£1.70
FF21X (Can 2200uF 50V)	£1.25
FF22Y (Can 2200uF 63V)	£1.45
FF24B (Can 3300uF 50V)	£1.60
FA12N (Can 3300uF 63V)	£1.95
FF26D (Can 4700uF 25V)	£1.35
FF27E (Can 4700uF 50V)	£1.95
FF28F (Can 4700uF 63V)	£2.40
FF29G (Can 4700uF 100V)	£4.65
FF30H (Can 6800uF 50V)	£2.45
FF31J (Can 10,000uF 25V)	£1.95
FF32K (Can 10,000uF 63V)	£3.75
FA13P (Can 10,000uF 80V)	£5.45
FA14Q (Can 22,000uF 63V)	£6.95
FA15R (Can 47,000uF 50V)	£10.95

High-Grade Can-Type Electrolytic Capacitors



A very high grade capacitor designed for use in the power supplies and outputs of high power audio amplifiers. The capacitor's excellent response is obtained by lowering the equivalent circuit series resistance to half that of ordinary capacitors. The high grade materials used in the capacitor are chosen to give superior aging and stable tonal quality over the audio range. In addition, particular care has been taken to ensure very low distortion levels, for example third harmonic distortion at 10kHz, 0.01A is 150dB or less. The capacitors are marked 'For Audio'.

Tolerance: ±20%. Temperature range: -40 to +85°C.

Value (μF)	Working V (DC)	Case size	Ripple current (max) at 100Hz 55°C	Leakage current (max)	Power factor (max)
		Lmm Dmm (max) (max)			
4700	63	80 35.5	7.7A	5mA	0.20
4700	80	80 40	8.2A	5mA	0.20
10,000	63	80 50.8	13.2A	6.3mA	0.20
10,000	80	100 50.8	14.6A	8mA	0.20
22,000	56	112 50.8	22.3A	12.3mA	0.20

Ripple currents: Those shown are the maximum allowable at 100Hz, 55°C. The maximum allowable at other frequencies and temperatures is as follows:

50Hz: 95%	120Hz: 100%	1kHz: 110%
10kHz: 130%	20kHz: 133%	
20°C: 140%	40°C: 120%	
70°C: 80%	85°C: 40%	of value shown.

Continued on next page.

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

All types are supplied with vertical mounting clips.
Clip dimensions:

Capacitor Dia. (mm)	Fixing Centres (mm)	Overall area (mm)
35.5	48	58 x 46
40	54	64 x 50
50.8	65 dia.	74.5 dia.

Order

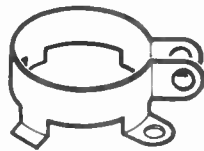
FA16S (Audio 4700uF 63V)	£4.95
FA17T (Audio 4700uF 80V)	£6.95
FA18U (Audio 10,000uF 63V)	£9.95
FA19V (Audio 10,000uF 80V)	£12.95
FA20W (Audio 22,000uF 56V)	£14.95

CAPACITOR MOUNTING CLIPS

Vertical

Type	Dia. of cap (min)	Fixing centres*
Clip Can 25	25.4	41.5
Clip Can 35	34.8	44.5
Clip Can 40	38.1	47.5
Clip Can 50	50.5	65.0

*Nominal with clip fully closed.

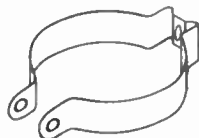


Order

FF33L (Clip Can 25)	16p
FF34M (Clip Can 35)	18p
FF35Q (Clip Can 40)	22p
FF36P (Clip Can 50)	55p

Horizontal

Type	Dia. of cap (min)
Horiz Clip 25	25.4
Horiz Clip 35	34.8



Order

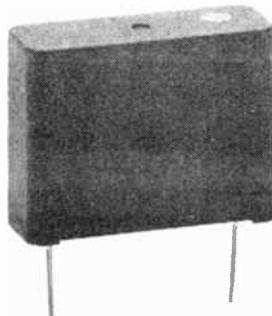
FF37S (Horiz Clip 25)	16p
FF38R (Horiz Clip 35)	18p

Memory Back-up Capacitor



A wet-type electric double layer capacitor offering a very large capacitance in a small size. The capacitor may have up to 5.5V constantly across it, but is primarily designed for 5V use in memory back-up situations. The capacitor is a suitable replacement for ni-cad batteries and is much easier to use. The capacitor can supply a CMOS memory for about 2 weeks in standby mode.

Working voltage:	5.5V
Surge voltage:	6.3V
Capacitance:	1F
Tolerance:	-20 +40%
Leakage current:	0.28mA
Internal resistance:	5Ω
Charge time:	through 47Ω: 4 minutes through 1kΩ: 2 hours
Discharge time (to 2V):	through 100Ω: 2.2 minutes through 1MΩ: 290 hours
Operating temperature range:	-25 to +70°C
Size (W x H x T):	42.5 x 32.5 x 15mm
Lead pitch:	32.5mm



Order

FA25C (Memcap 1F 5.5V)	£3.95
------------------------	-------

TRIMMER CAPACITORS

Miniature Film Dielectric Trimmers

A miniature trimmer sturdily constructed on a plastic frame. The dielectric is arranged so as to support the vanes giving a very high degree of stability. Adjustment is by means of a screwdriver slot in the upper face.



Working voltage:	100V DC
Insulation resistance:	>10,000MΩ
Power factor:	<10x10 ⁻⁴ at 1MHz: <25x10 ⁻⁴ at 100MHz

The following values are available:

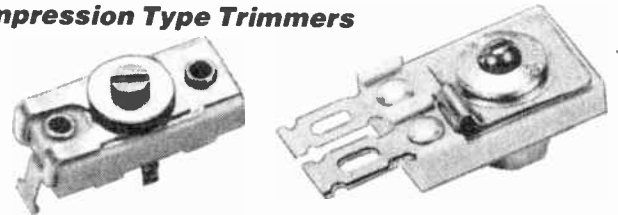
Max capacitance:	10pF	22pF	65pF
Capacitance swing:	2 to 10pF	2 to 22pF	5.5 to 65pF
Body colour:	Yellow	Green	Yellow
* Temperature coefficient:	-200	-350	-200
Height above board(max):	10	10	11
Max diameter:	8.8	8.8	11.5
Max dissipation:	0.35W	0.35W	0.9W

*Temperature coefficient is in ppm/°C with a tolerance of ±300.

Order

WL69A (Trimmer 10pF)	18p
WL70M (Trimmer 22pF)	20p
WL72P (Trimmer 65pF)	26p

Compression Type Trimmers



Compact compression adjustment trimmers having rectangular sprung leaf charge plates, using a mica dielectric on a ceramic base. 500pF type includes stud and fixing nut for attachment to a panel or chassis. Screwdriver adjustment. Two types available.

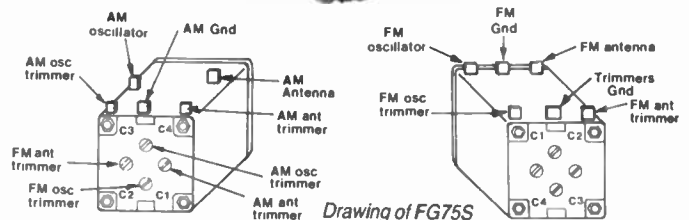
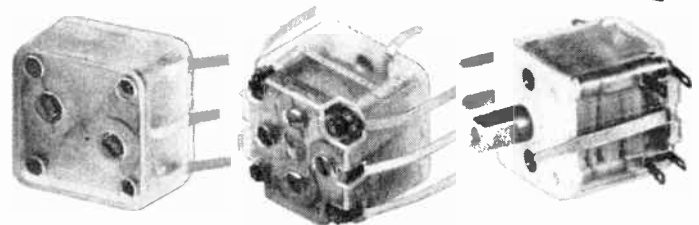
Type	Volts	Width	Depth	Height
3 to 40pF	250	21mm	10mm	6mm
100 to 500pF	350	24mm	16mm	5mm

Order

WL71N (Trimmer 40pF)	25p
WL73Q (Trimmer 500pF)	35p

VARIABLE TUNING CAPACITORS

AM/FM Miniature Tuning Capacitors



Miniature tuning capacitors for radios, ZN414 circuits and crystal sets. Each has an antenna section and an oscillator section for each band, and a trimmer for each section. The control shaft is a flattened 6mm dia. brass spindle, tapped down the centre with an M2.5 thread. Fixing is either direct pcb or by two M2.5 screws on 14mm centres on same face as shaft. (Note: Thread length is 3mm. If using long screws, take care that they do not foul the vanes.)

Specifications:

For stock code:	FG75S	FT79L	FT78K
Capacity AM sections:	266pF	126pF	141.6/59.2pF*
FM sections:	20pF	20pF	-
Q AM sections:	500	700	500
FM sections:	150	200	-
Total rotation:	180°	180°	180°
Max voltage:	100V	100V	100V
Dimensions mm:	20x20x21	20.2x20.2x17.8	20x20x13
(excluding shaft)			

*Antenna/Oscillator gang.

Order

FG75S (AM/FM Varitone)	£1.95
FT79L (Min AM/FM Tuner Cap)	£1.20
FT78K (Min AM Tuner Cap)	54p

Variable Capacitors

Mid-line O law characteristics. Air gap 0.19mm, 500V DC tested. Front area (including vanes) 34.95 x 43.25mm. Cadmium plated steel frames. Aluminium vanes. Ceramic insulation. Silver plated wipers. All types with 1/2in spindles.

Type O 1-Gang

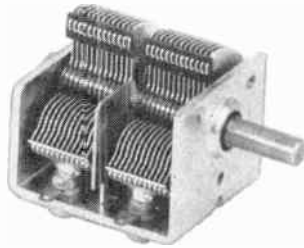
Length (excluding spindle) 23.8mm. AM capacity 10 - 365pF. Tested up to 75CV.



Order	
FF39N (Vari O)	£5.40

Type O 2-Gang

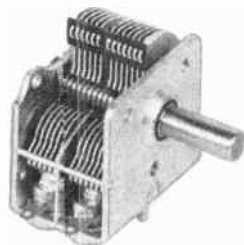
Length (excl. spindle) 43.25mm. AM capacity, each gang 10 - 365pF. Tested up to 750V.



Order	
FF40T (DG Vari)	£8.95

Type OO

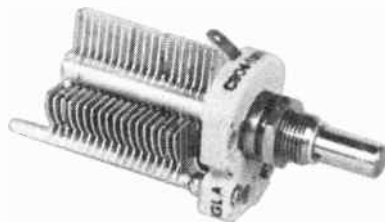
Length (excluding spindle) 23.8mm. AM capacity (front section) 10 to 208pF (rear section) 8.5 to 176pF. Tested up to 750V.



Order	
FF41U (Twin OO)	£8.95

Type C804A Series

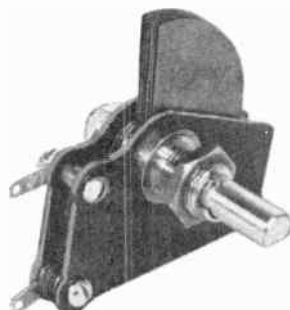
Air dielectric trimmer, SLC Law characteristics. Air gap 0.4mm, 750V tested, air gap 1.15mm 1250V DC tested. Front plate 23.8 x 31.75mm. Values available: 10pF, 15pF, 25pF, 50pF, 60pF, 100pF and 150pF.



Order	
FF42V (SW Trim 10pF)	£3.95
FF43W (SW Trim 15pF)	£3.95
FF44X (SW Trim 25pF)	£4.90
FF45Y (SW Trim 50pF)	£4.90
FF46A (SW Trim 60pF)	£5.95
FF48C (SW Trim 100pF)	£5.95
FF49D (SW Trim 150pF)	£5.95

Dilecon Capacitors

Solid dielectric. Front area 44.5 x 46mm. The following values are available: 6.5 - 300pF, 7 - 500pF.



Order	
FF50E (Dilecon 300pF)	£5.50
FF51F (Dilecon 500pF)	£5.50

CRYSTALS

A range of crystals for various applications. All types are cut for parallel resonance (except 18.432MHz which is cut for series resonance), but if it is required to use them in a series resonant circuit simply connect a Trimmer 65pF only in series with the crystal. The crystals are supplied in metal cans and details of the cans are given in the table.



Frequency Standards

Three crystals for use in frequency counters etc. and offering very high stability are available.

Frequency	Can Style	Adjustment Tolerance	Temp Stability	Temperature Range	Load Cap
100kHz	HC-34/U	—	±100ppm	0°C to +70°C	30pF
1MHz	HC-6/U	±10ppm	±20ppm	-20°C to +65°C	30pF
10MHz	HC-43/U	±20ppm	±10ppm	-20°C to +70°C	30pF

Order		
FY77J	(FS Crystal 100kHz)	£5.90
HX62S	(FS Crystal 1MHz)	£9.90
FY78K	(FS Crystal 10MHz)	£1.80

Microprocessor Crystals

Six crystals for use with the most popular microprocessor chips. Their typical applications are listed below:

1MHz	6800
2MHz	F8; 2650A; SC/MP; CDP 1802
2.5MHz	Z80
4MHz	Harris 6100; IM6100; PACE; Z80A; 6802.
6.144MHz	8085
18.432MHz	AM9080/8080A

Frequency	Can Style	Adjustment Tolerance	Temp Stability	Temperature Range	Load Cap
1MHz	HC-33/U	±50ppm	±50ppm	0°C to 50°C	30pF
2MHz	HC-33/U	±20ppm	±50ppm	0°C to 50°C	30pF
2.4576MHz	HC-33/U	±20ppm	±50ppm	-10°C to 60°C	30pF
4MHz	HC-18/U	±20ppm	±50ppm	-10°C to 60°C	30pF
6.144MHz	HC-18/U	±20ppm	±50ppm	-10°C to 60°C	30pF
18.432MHz	HC-18/U	±20ppm	±100ppm	-10°C to 60°C	SR

Order		
FY79L	(MP Crystal 1MHz)	£3.70
FY80B	(MP Crystal 2MHz)	£1.90
FY81C	(MP Crystal 2.4576MHz)	£1.90
FY82D	(MP Crystal 4MHz)	90p
FY83E	(MP Crystal 6.144MHz)	90p
FY84F	(MP Crystal 18.432MHz)	90p

Radio Control Crystals

A range of crystals for radio controlled models etc. All are plug-in and directly interchangeable. Can style: HC-25/U. Adjustment tolerance: ±30ppm. Temperature stability: ±50ppm. Temperature range: -10°C to 60°C. Load capacitor: 20pF.

Available only in matched pairs as follows.

Channel	Transmitter frequency	Receiver frequency
Brown	26.995MHz	26.540MHz
Red	27.045MHz	26.590MHz
Orange	27.095MHz	26.640MHz
Yellow	27.145MHz	26.690MHz
Green	27.195MHz	26.740MHz
Blue	27.245MHz	26.790MHz

Suitable for use with 455kHz i.f.'s.

Order		
HX30H	(MCR Crys Brown Pairs)	£2.45
HX31J	(MCR Crystal Red Pair)	£2.45
HX32K	(MCR Crys Orange Pair)	£2.45
HX33L	(MCR Crys Yellow Pair)	£2.45
HX34M	(MCR Crystal Green Pr)	£2.45
HX35Q	(MCR Crys Blue Pair)	£2.45

Colour TV Crystal

A crystal for use in colour TV receivers, TV games etc., operating at the colour sub-carrier frequency in PAL (standard British) TV receivers.

Frequency: 4.433619MHz. Can style: HC-18/U. Adjustment tolerance: ± 20 ppm. Temperature stability: ± 30 ppm. Temperature range: -10°C to 60°C . Load capacitor: 20pF.

Order

FY85G (Colour TV Crystal) 90p

Special Frequency Crystals

Two crystals, one for generating 1Hz and one for generating 50Hz when divided by 2^n , for timekeeping purposes, counters etc., using simple flip-flop divider stages. The crystal for generating 50Hz can be used to drive mains operated clocks from a battery when mains fails or in portable applications.

Frequency

3.2768MHz For 50Hz divide by 2^{16}
4.194304MHz For 1Hz divide by 2^{22}

For both types: Can style: HC-18/U. Adjustment tolerance: ± 20 ppm. Temperature stability: ± 30 ppm. Temperature range: -10°C to 60°C . Load capacitor: 12pF.

Order

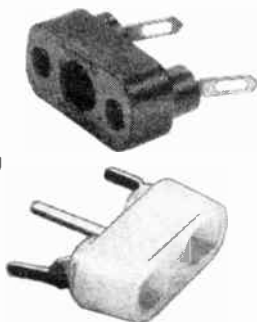
FY86T (Crystal 50Hz x 2.16) £1.40
FY87U (Crystal 1Hz x 2.22) 90p

Can Sizes

Style	Plug-in or Wire-in	Pins or Wire length	Pins or Wire Spacing	Can Dimensions(mm)		
				Height	Width	Thickness
HC-6/U	Plug-in	6mm pins	12.3mm	19.7	19.2	8.9
HC-18/U	Wire-in	20mm wires	4.9mm	13.5	10.9	4.5
HC-25/U	Plug-in	6mm pins	4.9mm	13.5	10.9	4.5
HC-33/U	Wire-in	20mm wires	12.3mm	19.7	19.2	8.9
HC-34/U	Wire-in	14mm wires	12.3mm	38.8	19.2	8.9
HC-43/U	Wire-in	20mm wires	4.9mm	13.5	10.9	4.5

Crystal Sockets

Two moulded nylon crystal sockets. One suits crystals with HC-25/U base and has printed circuit connections, while larger type fits HC-6/U base crystals and has solder tag connections.



Order

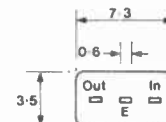
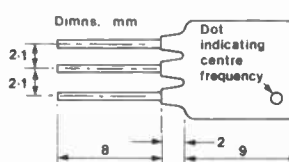
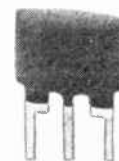
HX60Q (Crystal Socket 25u) 24p
HX61R (Crystal Socket 6u) 32p

Ceramic Filter

A ceramic filter designed primarily for use in FM receivers using a 10.7MHz i.f. The filters are small in size with high selectivity, good temperature stability and low distortion.

Specification

Bandwidth: 300kHz (-3dB)
600kHz max (-20dB)
Spurious peaks: (9 to 12MHz):
<40dB (typical)
6dB
Insertion loss: 6dB
Input-Output Impedance: $330\Omega \pm 15\%$
Breakdown voltage: 50V DC max
Ripple: <1dB



Owing to the way ceramic filters are manufactured they do not all have an exact 10.7MHz centre frequency. All designers should be aware of this fact and all commercial designs usually allow the i.f. to be used to at least 10.58 to 10.82. The fact that the i.f. is not exactly 10.7MHz has no effect whatsoever on any other parameter and the overall quality of the tuner is not affected in any way. However it is absolutely vital that all the ceramic filters in one tuner have the same nominal centre frequency. Therefore during manufacture they are tested and colour coded into matched groups as follows:

10.64 MHz $\pm 30\text{kHz}$ Black
10.67 MHz $\pm 30\text{kHz}$ Blue
10.70 MHz $\pm 30\text{kHz}$ Red
10.73 MHz $\pm 30\text{kHz}$ Orange
10.76 MHz $\pm 30\text{kHz}$ White

Therefore if you are ordering ceramic filters for more than one tuner please indicate how many filters are required per tuner so that we can supply them in sets if we do not have enough of one colour to fulfil the whole order.

Order

HX99H (Ceramic Ftr 10.7MHz) 95p

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COMMUNICATIONS

Dummy Load	96	Ground Plains	96	PA Amps	96
Filters	95	Intercoms	96	Radio	97

CB ACCESSORIES

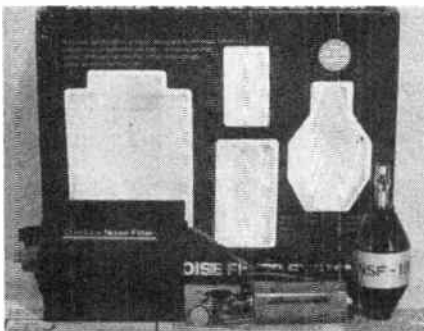
CB Power Supply



Many of the lower priced power units offered for sale are very dangerous, but this unit meets the British safety standards. The unit will easily drive any CB set and all accessories. The power unit will deliver a regulated 13.8V at any current up to 3A max. It is short circuit protected and British made. There is an on/off switch and approx 1.5m of mains flex for connection to 240V mains. Overall size 200 x 120 x 100mm.

Order
YG10L (12V 3A Power Unit) £17.95

Noise Filter System



A unique combination of filters designed to eliminate interfering noises from various sources in the car. The ignition noise suppressor plugs directly into the distributor cap and is inductive rather than the usual resistive type, thus keeping the DC spark voltage high, but offering very high resistance to hf signals. The normal type of resistive suppressor does reduce the efficiency of the engine and makes the car harder to start in cold weather. A large filter is included for connection in the live and return paths of the power supply to the CB set, giving a very high immunity to noise entering the set by this route. An alternator noise filter and generator noise filter are also included. The one not required by your car can be used to suppress, for example, the turn indicators or windscreen wiper motor etc. The units are attractively packaged and supplied with detailed instructions.

Order
YK30H (Noise Filter System) £7.95

Low Pass Filter



A low pass filter designed to cut-interference to TV and Band II transmissions. When inserted in the antenna lead of a transmitter it provides a fast cut-off of harmonic energy over 30MHz. Fitted with a standard 'uhf'-type socket at each end for connection to the transmitter and antenna.

Specification:
 Cut-off frequency: 30MHz
 VSWR (max. at 27MHz): <1.2:1
 Impedance: 50Ω
 Dimensions: 80 x 55 x 40mm.

Order
YB00A (Low-Pass RF Filter) £3.95

TVI Filter



A high quality filter designed to be inserted in the aerial leads of TV sets suffering from interference from CB transmissions. The filter is peaked to reject signals from transmitters operating on 27 to 28MHz while giving a very low insertion loss to UHF TV signals. The unit plugs directly onto the end of the existing TV aerial lead.

Order
YL43W (TVI Filter) £4.95

CB Antenna Converter



Now you can use your existing car aerial to receive and transmit from your CB set. Simply unplug aerial from radio and connect the three leads supplied with the converter as shown in the instructions. The leads are ready terminated with correct plugs and sockets for direct connection. A mounting kit is also supplied.

The front panel of the converter has a switch for CB or radio, an SWR adjustment control and an indicator lamp that should light when transmitting. Overall dimensions: 86 x 60 x 50mm.

Order
YL44X (CB Aerial Converter) £3.95

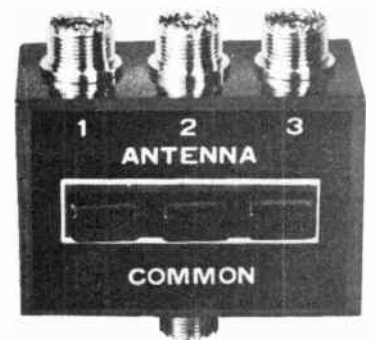
CB/Car Radio Aerial Coupler



This unit enables the CB and radio set to share the one CB aerial. The existing CB aerial connects directly to the socket on the coupler whilst two leads are provided, one terminated in a standard plug for direct connection to the CB set and one terminated in a car aerial plug for direct connection to the radio set. Trimmers for the CB and the radio can be adjusted through holes in the front of the coupler. Overall size: 67 x 46 x 30mm.

Order
YQ73Q (CB/Radio Aerial Cplr) £2.80

Antenna Switch



A switch to permit one transmitter or receiver to be connected to any one of three antennae, or vice versa. The unit has three push-button switches and four 'uhf' type sockets.

Specification:
 Power handling: 150W
 SWR: <1.2:1
 Frequency: up to 30MHz
 Dimensions: 80 x 55 x 40

Order
YB01B (RF Antenna Switch) £6.95

PHONE NOW
0702 552911



Access, Visa, American Express, Mapcard.
 Phone before 2pm for same day despatch.

Magnetic Base



A heavily chromed solid magnetic base that will hold very strongly to any ferrous surface. The base has an SO239 UHF-type socket for the antenna and 3m of 50Ω cable terminated in a PL259 plug. Base size: 90mm dia. 47.5mm high.

Order

YG16S (Mag Mount) £9.95

Dummy Load



A dummy load rated at 30W for testing and setting-up CB and amateur radio transceivers. The dummy load has a nominal 50Ω impedance and is terminated in a PL259 plug.

Order

HL94C (30W Dummy Load) £8.95

GROUND PLANES FOR CB AERIALS

For aerials not mounted on vehicles, a ground plane must be provided which could consist of two or more pieces of 32·02 wire (or similar) stretched radially away from a metal plate on which the aerial is mounted. The wires should be connected to the plate (which should already be in connection with the outer screen of the feeder cable via the aerial mounting) and each should be at least 2m long. Adjust the lengths and position the wires to obtain the lowest SWR reading. The position of the feeder may also have an effect. It should be easy to obtain readings better than 1.5:1. Note that large metal objects such as water tanks will affect the performance. It is also important to note that if the SWR reading is worse than 3:1 when you begin, then transmit for as short a time as possible. You will need to have the metal plate supported about 3cm above the ground in order to give clearance for the fixing and connector. If your aerial is adjustable for length then it should be possible to reach an SWR of 1:1 on channel 20 by careful adjustment.

PUBLIC ADDRESS AMPLIFIERS

Low Cost Mobile 5W

A small, low-cost 12V DC public address amplifier capable of delivering 10W rms intermittently or 5W rms continuously. At higher powers the amplifier gets hot and automatically switches off until it has cooled down. Thus it may be used at full power for intermittent speech or at lower levels for music and speech. The unit has sockets for microphone with



standard (1/2in.) or 3.5mm jack plug and another 3.5mm jack socket for tape recorder, radio, record player etc. An overall volume control is fitted.

Specification

Operating voltage: 12 to 16V DC (negative earth)
 Output power: 10W rms (intermittent use) into 8Ω
 5W rms (continuous use) into 8Ω
 7½W rms (continuous use) into 4Ω
 Frequency response: 150Hz to 5kHz
 Microphone: 600Ω dynamic or electret unidirectional (not supplied)
 Dimensions: 128 x 58 x 40mm (plus knob)

Supplied complete with fixing bracket, 250mm long wires for connection to speaker wires, battery and earth (battery lead has in-line fuseholder with 3A fuse fitted), and a 1m lead with a 3.5mm jack plug fitted at each end.

Order

WY11M (Compact PA Amp) £29.95

10W Mobile



A 12V DC public address amplifier capable of delivering 10W rms into an 8Ω or 4Ω load continuously. The unit has two standard (1/2in.) jack sockets, one for microphone and one for tape recorder, radio, record player etc. Each input has its own on/off switch and there are separate tone and volume controls.

Specification

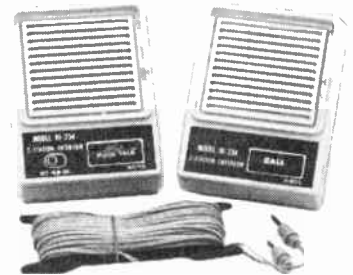
Operating voltage: 12 to 16V DC (negative earth)
 Output power: 10W rms continuous into 4Ω or 8Ω
 Frequency response: 200Hz to 10kHz
 Microphone: 600Ω dynamic or electret unidirectional (not supplied)
 Dimensions: 165 x 110 x 40mm

Supplied with fixing bracket, 5m speaker connection wires and 1.1m power connection wires with an in-line fuseholder with a 1.5A fuse fitted in the positive wire.

Order

WY12N (10W PA Amp) £39.90

INTERCOMS 2-Station Intercom



A good quality two station intercom supplied complete with 20 metres of lightweight connecting cable with 3.5mm jack plugs on each end. Intercom has buzzer calling with push-buttons and a volume control on master unit. Operates with battery (supplied) and has a 200mW output. Size: 120 x 83 x 51mm. Battery replacement type PP3.

Order

LB72P (Intercom 2-Station) £10.95

4-Channel Wireless Intercom



A very high quality intercom which is mains operated and transmits and receives via the mains wires. No interwiring is required. The operating system is FM with phase locked loop which gives high quality sound without interference from the mains. The unit can transmit or receive on any one of four channels which are selected by switches. Any number of units may be connected, but if more than four then a call on a particular channel will sound the buzzer in more than one unit. All units are normally switched on and with a different channel button pressed on each unit. The red 'receive' lamp will glow. Should you wish to make a call, press the appropriate channel button and touch the 'call' sensor plate. The 'receive' lamp will go out and the 'call' lamp will light. At the unit normally switched to that channel a tremolo-type buzzer will sound. When the buzzer stops the called station touches the 'call' sensor and speaks. The green 'transmit' light will go on. When the 'talk' sensor is released the 'transmit' lamp goes out and the 'receive' lamp glows in readiness for the calling station to transmit. A volume control is provided to adjust the level of the received signal. At the end of the conversation the calling station re-presses his normal channel button and the unit is then on standby again awaiting a call from any other station. A 'lock' button is provided which locks the unit in the transmit mode. Thus this unit could be situated in a baby's room and will transmit continuously to a unit on the same channel which can be moved around with the parents or babysitter and plugged into the mains to receive anywhere in the house. It may also be possible to communicate with neighbours up to about half a mile, although this will depend on whether both houses are on the same mains phase and the same outlet on the local sub-station transformer.

Channel carrier frequencies are 160kHz, 190kHz, 220kHz and 250kHz.

Overall size: 220 x 133 x 53mm.

Note: This unit is sold individually, not in pairs.

Order

XY77J (4-Channel FM Intrcom) £39.95

FM Wireless Door Phone Set



An intercom which is mains operated, and transmits and receives via the mains wires. The operating system is phase locked loop FM, which gives high quality sound without mains interference. The unit comes in three parts, the door phone, the amplifier/receiver, and the additional intercom.

The door phone is housed in a mid-grey plastic case and has a Call button, which when depressed, allows communication with the amplifier/receiver for 30 seconds. For a further 30 seconds the Call button must be pressed again. The additional intercom provides a facility for internal communications, and also allows you to speak to whoever is at the door without the Call button being pressed. Both internal units are fully portable and can be used anywhere in

the house where there is a mains socket, although for best operation the three units should be at least 20 feet away from each other. Further channels can be installed if desired, by using one of our intercoms XY77J.

It may also be possible to communicate with neighbours up to about half a mile, providing that both houses are on the same mains phase and outlet on the local sub-station transformer. Frequency is 230kHz.

Order

RK81C (FM Door Phone Set) £58.95

AM/FM Transistor Radio



A good quality AM/FM transistor radio, covering the medium and VHF wavebands. Tuning dial covers 540 to 1600kHz (187 to 555 metres) and 88 to 108MHz. Excellent reception of all national stations and local radio in most areas. Good reception of police broadcasts at around 100MHz in some areas (please note that it is illegal to listen to these broadcasts). Powerful 250mW output. Finished in khaki green. Overall size 140 x 82 x 45mm. Complete with wrist carrying-strap and telescopic aerial for FM band (extends to 380mm). Has a 2.5mm jack socket for earphone, not supplied. Requires four HP7 batteries, not supplied.

Order

AF10L (AM/FM Radio) £4.95

**FAST SERVICE
LOWEST PRICES**



COMPUTERS

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MICROPROFESSOR MPF-1P

- ★ Learn the fundamentals of microprocessor systems using the Multitech MPF-1Plus.
- ★ Create a low cost Z80 development system using the Multitech MPF-1P + Printer + Eprom Programmer Board.
- ★ Create a powerful low cost controller using the Multitech MPF-1P + Printer + Input/Output Board.

Never before has such an exciting, multi-purpose, expandable piece of microprocessor equipment been offered to industry, education, and the hobbyist. This is how the Microprofessor (MPF-1Plus) can help you:

- ★ If you are an engineer then you will know the MPF-1Plus is built round the Z80, the most widely-used 8-bit microprocessor in the world. This means that any work that you perform on this system, be it programming, de-bugging or development work, will be directly adaptable to many other systems.
- ★ If you are a student, the MPF-1Plus, coupled with the Student Work Book, will take you step-by-step from unpacking the system, through experiments, to a full understanding of the fundamentals of micro processor systems. You will use machine code and assembler programming in the many experiments and examples in the "Experiment Manual" (supplied) and Student Work Book (extra).
- ★ The MPF-1Plus itself is just the beginning of a system that has 7 add-on boards and 2 extra software ROM's giving 'BASIC' and 'FORTH'.

'Electronics and Computing Monthly' said of the system: "The standard of documentation provided by the Multitech Corporation to accompany the MPF-1Plus sets a level that many other people could do well to copy...." "The standard of construction was high, coupled with the wealth of documentation provided, the system is indeed a powerful software development tool". and 'Practical Electronics' said:

"Closer examination of the PCB reveals the same high standard of construction common to all Multitech products...the workbook is suitable for an absolute beginner...One of the most commendable features of the Microprofessor System is the level of expansion.....one gets a very much enhanced machine and one that still represents good value for money".

MPF-1P Microprofessor

Everything you need to become proficient in microcomputing is included with your basic Microprofessor. It includes the Z80 processor chip with on-board 4K-byte RAM and 8K-byte ROM, accessed by a high-quality, 49key keyboard, with its own internal power supply. There's much more: The built-in speaker, the interface for program storage/reading to and from cassette, 20-digit, 14-segment alphanumeric green display, 48 input/output lines, battery back-up circuits for the RAM contents, bus-expandable Z80 architecture as a standard feature, and three essential user manuals.

Advanced Interactive Monitor

MPF-1P software resides as firmware in 8K-bytes ROM on the singleboard computer. This monitor responds to a comprehensive set of selfprompting, single-key commands. The monitor includes a powerful Line Assembler, Disassembler, Text Editor and Two Pass Assembler. It also provides the interface to the optional BASIC and FORTH interpreters.

Line Assembler

The Line Assembler allows you to key in programs by mnemonic codes. Each line will be stored in memory in machine code.

Disassembler

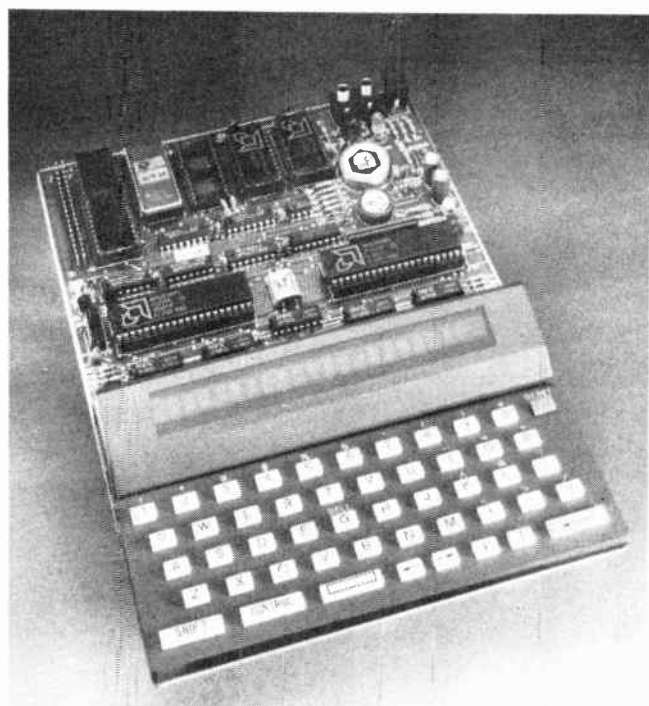
(The Printer is necessary for disassembly work). The Disassembler allows you to list the Z80 machine codes on the green display and optional printer in mnemonic form with symbolic labels.

Text Editor

The Text Editor allows you to add, change or delete instructions anywhere in a program without affecting any other portion. It uses simple commands, which may be displayed or listed via the printer or display. The source code in the edit buffer is translated into machine code by the Two Pass Assembler.

Two Pass Assembler

The Two Pass Assembler allows the user to write exceptionally efficient programs for applications in which execution speed is critical-real-time process control, for



example. The Two Pass Assembler shortens the development and documentation time for complex programs by allowing the user to assign labels to instructions, subroutines and data locations.

User's Manual

Standard with your Microprofessor, this basic manual provides you with a full understanding of all the features and capabilities of your system. Contents include: Hardware/software specifications and physical configuration; General description and operation introduction; Detailed hardware/software descriptions; Monitor subroutines; Memory check data; Appendices and references; Text Editor; Assembler and Disassembler and Memory Mapping.

Experimental Manual

Furnished with your Microprofessor, this manual covers all facets of learning with and using your system and exercising its complete capabilities. Material covered comprehensively includes: Designing microcomputer programs; Data transfer experiments; Complete mathematical/logical functions (nine experiments); System applications (eight experiments) and Display function and operation.



Monitor Program Source Listing Manual

Also part of the basic Microprofessor package, this manual gives you the complete source-code listings of the MPF-1P monitor, providing the user with a detailed insight into all the capabilities and functions of the complete system from the programming stand-point.

Display

The bright, clear alphanumeric display with its green characters, can be seen in even the highest normally encountered, ambient lighting conditions.

Keyboard

This advanced elastomeric keyboard, with its conductive foam rubber impinging on gold plated contacts, not only gives a 'good feel' but is the most reliable technology in use on this type of system.

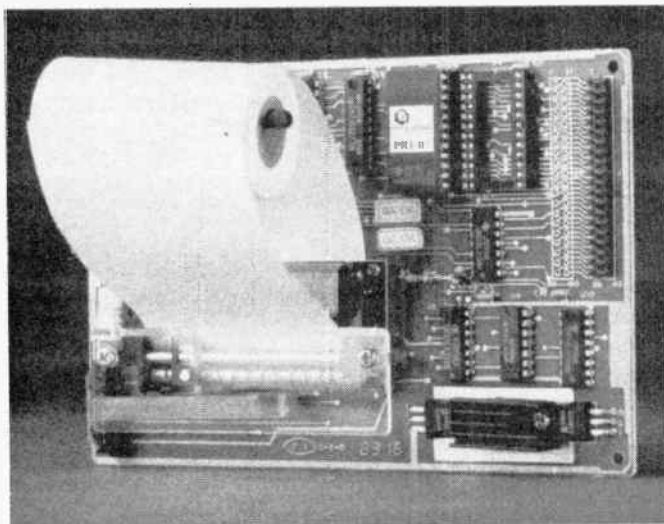
Specification

Z80 CPU high performance microprocessor with 158 instructions. 4K RAM with battery back-up circuits provided for the user to keep the contents of the RAM. 8K ROM-based sophisticated monitor expandable to 16K. 8K of sophisticated monitor, including text editor, two pass assembler, line assembler, break point, system initialization, keyboard scan, display scan, tape write and tape read, register and memory modification, insert, delete, move relative, fill and step execution. 20-digit, 14-segment green phosphorescent display. 49-key alphanumeric keyboard including editing and function keys. Audio cassette interface: 165 baud average rate for data transfer between memory and cassette tape. Extension connectors: all CPU buses available for expansion. 2.25" diameter speaker. 9V, 0.6A adaptor provided. Three complete self-learning textbooks with experiments and applications.

Order

XG66W (MPF-1P Microprtsr)..... £194.35

Printer for Microprofessor MPF-1P



The optional printer gives you a permanent, written alphanumeric record of data and programs from your Microprofessor. The compact thermal print mechanism forms clear, easily-read letters and numbers at almost one line per second on a 20-character width. The printer board incorporates several useful features, such as Memory Dump Utility, Z80 disassembler-listing Utility, and printer Driver utility.

Specification

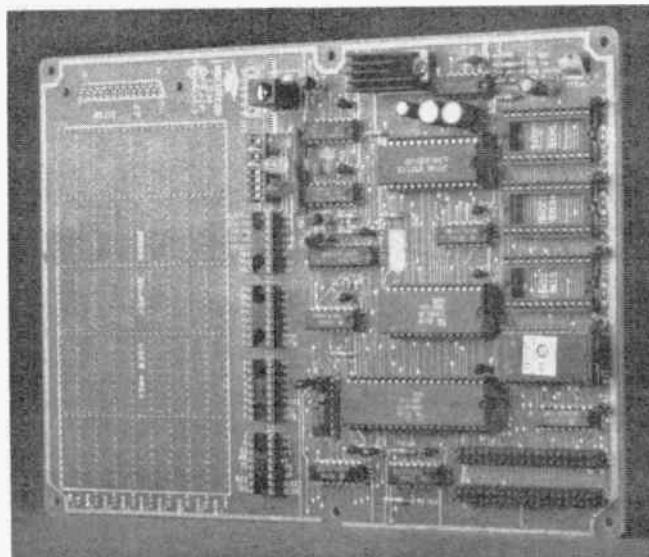
5 x 7 matrix characters. Built-in alphanumeric character patterns. Built-in MPF-1P memory dump utility. Built-in Z80 Disassembler. Prints at 0.8 lines per second. Includes 40-way connection cable. Includes comprehensive manual. Includes 1 roll of thermal paper. 20 characters, 138 dots per line. 9V, 1A adaptor provided.

Order

YJ30H (MPF-1P Printer)..... £109.25

Input/Output and Memory Board for Microprofessor MPF-1P

Expand the Memory and I/O ports. The Input/Output and memory Board provides you with the Counter/Timer chip (Z80-CTC), Communication Interface Chip (USART 8251) and Parallel-I/O chip (Z80-PIO) to increase the MPF-1P I/O capacity to interface with the outside environment. So that the MPF-1P is the starting choice of professionals for microcomputer design and product applications. It also has a facility for an extra 6K-bytes of RAM and 4K-bytes of ROM to expand the memory of the MPF-1P.



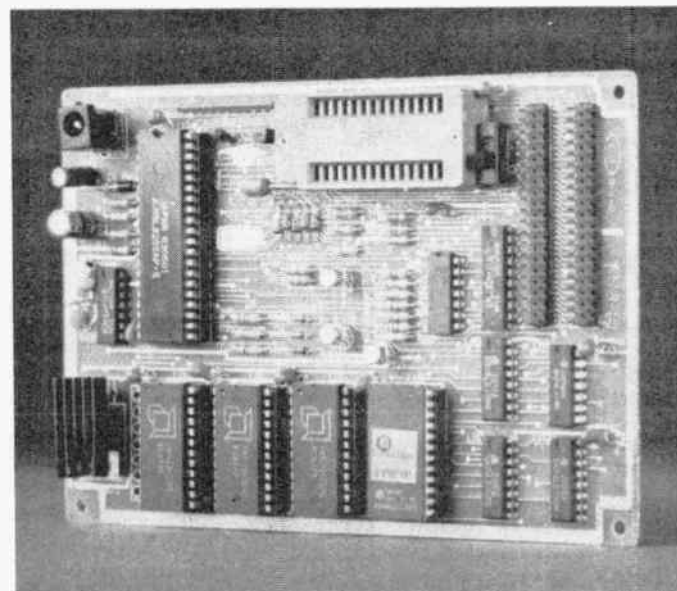
Specification

Z80-PIO: 16 I/O lines uncommitted. Z80-CTC: 4 Timer channels. Z80-USART: Communication IC gives an RS232 Interface via standard connector. (Connector extra). Facility for 3 x 2K RAM (6116) memory expansion. LED's Red, Amber and Green for traffic light simulation etc. 8-way DIP switch to simulate input conditions. 4 x 16-pin DIL sockets for input/output connections. Extensive 'Bread Boarding' area, all inter-bussed with GND and +V. 9V, 1A adaptor provided. Includes comprehensive manual. Includes 40-way connection cable.

Order

YJ31J (MPF-1P I/O Memory Bd)..... £126.50

EPROM Programmer for Microprofessor MPF-1P



The optional EPROM programmer board adds power and flexibility to your Microprofessor. It's a single, plug-in card with its own connector that can accept currently available 1K, 2K, 4K and 8K EPROM devices operating on +5V power. The EPROM board lets you read data from EPROM memory onto the RAM buffer, then verify, display, list or modify the data. You can write data from RAM to EPROM memory as required by your program, and delete/insert at will using both memory capabilities. The EPROM you have can then be plugged into the vacant socket on the MPF-1P for a permanent memory or to become resident program.

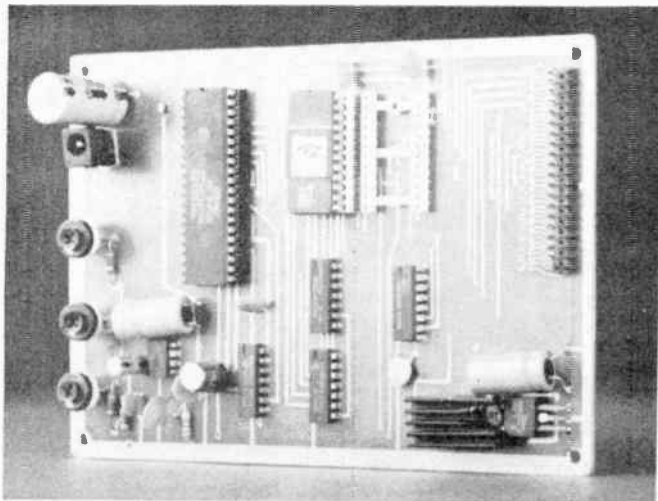
Specification

For all +5V 1K/2K/4K/8K EPROM's. MPF-1P compatible, using 40-pin flat ribbon cable and connector. Single +5V 4K EPROM, 2732. Monitor EPROM address: 9000-9FFF. Static 2K RAM, 6116 x 3. Basic RAM address: D800-EFFF. Programmable I/O lines. I/O 8255, 24 parallel I/O lines. I/O address 78-7F. Main power input: 9V 500mA adaptor provided. 28-pin, zero insertion force socket.

Order

YJ32K (MPF-1P EPROM Progrm)..... £149.50

Sound Generator for Microprofessor MPF-1P



The optional Sound Generation board converts your Microprofessor into a system for producing music and other sounds – a three octave electronic organ with replay and 'rhythm' as well as a melody or sound generator. A built-in audio speaker on the board provides high-quality sound output. Your sound 'programs' are entered through the keyboard. The rapid growth of synthesised music by computer, and the wide use of electronic sound generation in many fields of music, provides the basis for a valuable learning experience with your Microprofessor.

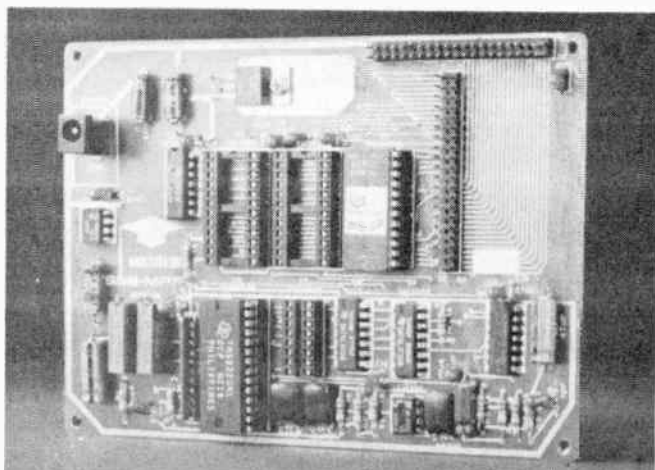
Specification

High reliability GI AY-3-8910 programmable sound generation chip. 4K EPROM for storing sound generation programs and data. One EPROM socket for expanding sound data. Shares Z80 CPU as host controller and 4K RAM of MPF-1P as memory for sound data. Built-in amplifier circuit and high quality speaker. 9V, 1A adaptor provided. Includes comprehensive manual. Includes 40-way connection cable.

Order

YJ33L (MPF-1P Sound Gen) £109.25

Speech Synthesiser for Microprofessor MPF-1P



The optional Speech Synthesiser board lets you create voice output from your Microprofessor. The board – complete and ready to plug in – uses the reliable, fully developed speech-synthesis microcircuit produced by Texas Instruments. It includes a 20-word vocabulary plus time-clock program on the board, from the existing 1,200-word T1 word 'library'. Two additional EPROM sockets on the board allow you to add words selectively as you need them. You enter commands through the Microprofessor keyboard and hear the words through the on-board audio speaker standard with your MPF-1P.

Specification

High reliability T1 TMS 5220/5200. Two EPROM sockets for expanding vocabulary. Shares Z80 CPU of MPF-1P as host controller. MPF-1P keyboard and speaker used for input output. Adjustable voice pitch and volume. 9V, 0.5A adaptor provided. Includes comprehensive manual. Includes 40-way connection cable.

Order

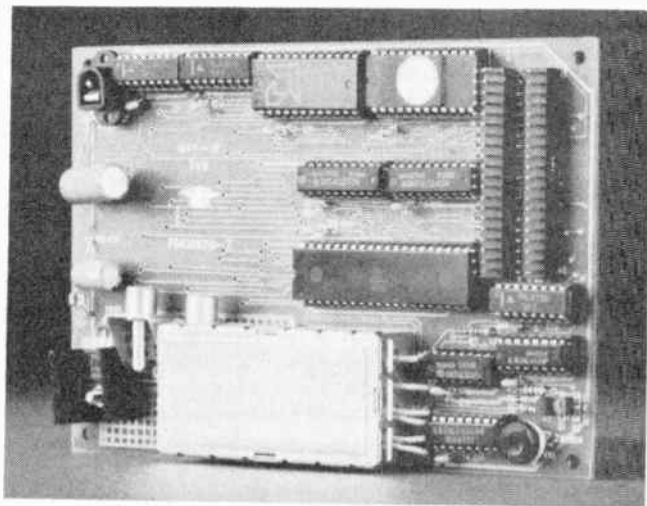
YJ34M (MPF-1P Speech Synth) £126.50

Video Monitor Board for Microprofessor MPF-1P

The video monitor board is designed to give a standard composite video output of 1 volt peak to peak. Display is in a 32 x 16 character format and it can display in graphics as well as text mode. It has its own on-board software for processing the screen editor also enabling it to read and write from the extra 2K of RAM on board.

Specification

6847 LSI video processor IC. 2K RAM memory expansion. 2K ROM extra software support. Screen editor. Page or screen modes. Large 32 x 16 display format. Stackable with other accessories. Power supply included. 40-way connecting cable. Comprehensive manual.

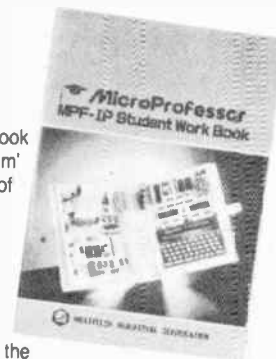


Order

YJ35Q (MPF-1P Video Board) £138.00

Student Workbook for Microprofessor MPF-1P

Available for your MPF-1P, the Student Workbook is a 300-page, step-by-step instructional 'system' to bring you from initial unpacking and turn-on of your MPF-1P to full working familiarity. Written in easy-to-understand tutorial form, the Workbook provides effective explanation-exercise answer formats on all key operations, applications and functions. The eight chapters include keyboard familiarisation, avoidance of programming problems, introduction to the hardware and software, an explanation of the monitor and its useful routines, and data on how to read and understand the hardware schematic. Appendices provide detailed, helpful references, an explanation of keyboard capabilities and full definitions of all registers used in the system. Although optional, the Student Workbook is an essential reference tool for serious students of the Microprofessor.



Order

WM96E (MPF-1P Workbook) £19.95NV

BASIC Interpreter for Microprofessor MPF-1P

An easy-to-learn language, BASIC is the most widely used programming tool for general computational tasks. The MPF-1P BASIC interpreter contained on 8K bytes ROM which includes floating point arithmetic. The MPF-1P BASIC interpreter can solve business, engineering and scientific problems, assist with decision-making, teach, even entertain.

Order

YJ28F (MPF-1P Basic Intprtr) £41.40

FORTH for Microprofessor MPF-1P

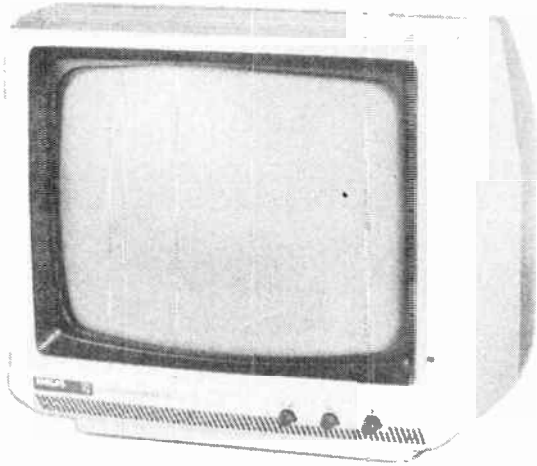
FORTH gives MPF-1P users an expandable, structured, stack-orientated language which is programmed in Reverse Polish Notation, the same as that used in popular programmable scientific calculators. Relative to other languages FORTH is so simple to use for control applications that even non-programmers can use it successfully. FORTH is contained in 8K bytes ROM, plugged directly into the MPF-1P single-board computer.

Order

YJ29G (MPF-1P FORTH ROM Brd) £48.00

MONITORS

Green Display Monitor



A compact, monochrome TV monitor having a 12 inch, high resolution picture tube with an anti-reflecting screen to preserve readability. The phosphor is green P31 (the colour green has been medically proven to be easier on the eyes). The monitor will accept RGB drive video and sound via a 6-pin DIN socket, or composite video via a single phono socket. The RGB input is compatible with TTL direct (0V to 5V in), with audio input ranging from 100mV to 2V. The phono input requires a composite video signal with negative synchronisation of 1V p-p into 75Ω impedance. Comes with instruction booklet with circuit diagram.

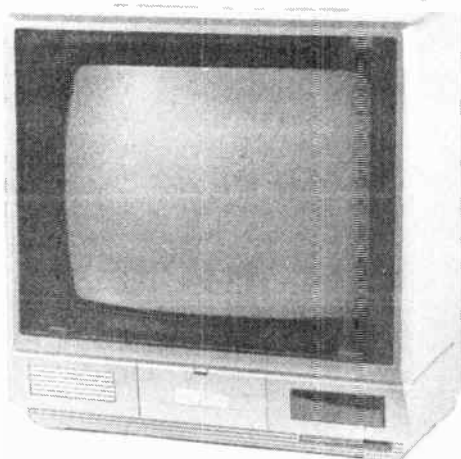
Specification:

Video bandwidth:	>18MHz		
Resolution:	800 lines in centre of screen.		
No. Characters:	80 x 25 lines, 2,000 total max.		
Line frequency:	Standard 15,625Hz ±600Hz.		
Frame frequency:	Standard 50Hz.		
Audio output:	0.3W 5% THD		
Power:	240VAC/50Hz at 25VA		
Dimensions:	Width	Depth	Height
	345mm	300mm	302mm
	(14in)	(11¾in)	(11¾in)
Weight:	7.25 kg		

Order

XG64U (TV Monitor V7001) £79.95

Colour Monitor



A full colour TV monitor with a 14 inch self-converging picture tube. The monitor is suitable for use as a display for any computer having either a RGB + Audio or composite video output, but it cannot be used with equipment having only modulated RF output. It is primarily intended for the role of VDU for microcomputers in the home or in many professional applications. The monitor features the new Euro standard SCART connector system, to couple directly without requiring UHF modulation techniques to the Dragon, BBC Acorn, Oric, Commodore 64 and Atari computers. Some other micro's e.g. ZX Spectrum will require some form of interfacing. In addition the colour monitor is readily usable with video recorders also having the SCART connector, thereby entirely bypassing

the UHF receiver processes which action should better preserve picture quality. It is even possible, using this method, to receive TV transmissions via the VCR where the monitor is sourced from the recorder's video output socket. The monitor's SCART socket is dual function depending on plug wiring, for either direct RGB drive video at 1V p-p into 75Ω, or for composite video at 1V p-p with negative going sync into 75Ω impedance.

Specification:

Video bandwidth:	12MHz		
Line frequency:	15,625Hz		
Frame frequency:	50Hz		
Geometric raster distortion:	Within ±1.5%		
Shadowmask pitch:	0.63mm		
Audio input:	200mV rms into 1kΩ		
Dimensions:	Width	Depth	Height
	375mm	390mm	375mm
	(14¾in)	(15½in)	(14¾in)
Weight:	12kg (26lb)		

Order

XG65V (TV Monitor CM14) £229.95

JOYSTICK CONTROLLERS

Starfighter Joystick



A robust, comfortable to hold, fast and accurate joystick. Supplied with an extra long lead for ease of use, one fire button, and a slim joystick shaft.

Order

AF90X (Starfighter Joystick) £15.95

Le Stick

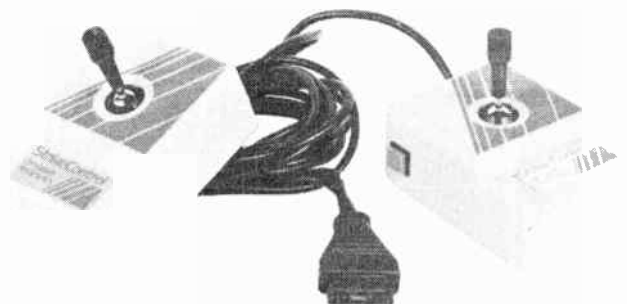
Give the Space Invaders a fight they'll remember with our super-fast-action Le Stick controllers. Replaces the standard joystick on Atari video game, Atari computers and Commodore computers. Internal motion detectors sense hand movements and large red push-button on top of Stick is your 'fire' button. Squeeze the stick to disable the motion detectors. A MUST for the serious devotee of Space Invaders, Star Raiders, Asteroids, Missile Command etc.



Order

AC45Y (Le Stick) £24.90

BBC Model B Strike Control



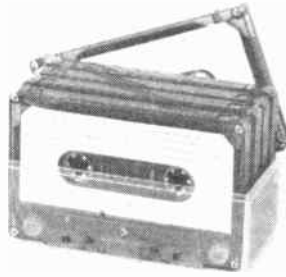
A smart looking pair of joystick controllers suitable for use with the BBC model B computer. These controllers feature full analogue control with two potentiometers, and short, self centring joysticks with thumbcups for sensitive fingertip control. Two click action fire buttons are also included for each unit, and the cases have four non-slip rubber feet for table-top use.

Order

YJ25C (BBC Joysticks) £19.95

DATA STORAGE Data Cassettes

A pack of 5 good quality data cassettes having a 12 minute total running time (6 minutes per side). The cassettes have a short leader tape and feature very low drop out. The low cost per cassette makes it viable to keep one or two programs on each cassette saving the problem of searching through longer tapes to find program start-points. The tapes are suitable for use on any kind of cassette recorder.



Order

BK95D (Data Cassette) £1.80

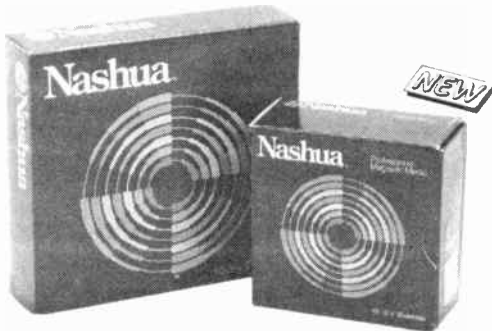
FLOPPY DISKS

5 1/4in. Mini Diskettes
and 3 1/2in. Micro Diskettes

STAR BUY



A very high quality range of floppy disks manufactured by Nashua, one of the world's leading manufacturers of magnetic media for computers. These disks are guaranteed against any defect in manufacture for five years in addition to your statutory rights. And we can attest to the quality of Nashua products since we have been using the same three Nashua 67Mbyte hard disks on our main computer for the last 6 years, where they undergo millions of accesses every day without fault. We chose Nashua; we confidently recommend you make Nashua your number one choice.



Specification:

	5 1/4in.	3 1/2in.
Outer jacket size:	13.335 (±0.038)cm	9.4 x 9mm
Thickness:	1.816 (±0.165)cm	0.33cm
Material:	Vinyl chloride with a non-skidding synthetic fibre lining	
Disk outer diameter:	13.017 (±0.008)cm	-
Inner diameter:	2.857 (±0.002)cm	-
Nominal thickness:	0.0076cm	-
Material:	Mylar with $\gamma\text{Fe}_2\text{O}_3$ coating	
Coating thickness nominal:	2.8 μm	-
Surface roughness:	0.076 μm	-
Operating and storage temperature range:	10°C to 53°C	10°C to 60°C
Relative humidity:	8% to 80%	-

Diskettes should be held at room temperature for one hour before use.

The following types are available:

	TPI	BPI	Tracks/ Surface	Storage capacity (Bytes)
5 1/4in. diskettes:				
Single-sided, Double-density	48	5536	40	250,000
Double-sided, Double-density	48	5536	40	500,000
Single-sided, Quad-density	96	5536	80	500,000
Double-sided, Quad-density	96	5536	80	1,000,000
3 1/2in. diskettes:				
Single-sided, Double-density	135	8717	50	500,000
Double-sided, Double-density	135	8717	50	1,000,000

All types are available singly or in boxes of ten.

Order

YX87U (S/S D/D Disk 5.25)	£1.60
YJ00A (10 S/S D/D Disk 5.25)	£14.50
FT80B (D/S D/D Disk 5.25)	£1.99
YJ70M (10 D/S D/D Disk 5.25)	£17.95
FT81C (S/S Q/D Disk 5.25)	£2.15
YJ71N (10 S/S Q/D Disk 5.25)	£19.45
FT82D (D/S Q/D Disk 5.25)	£2.35
YJ72P (10 D/S Q/D Disk 5.25)	£19.95
FT83E (S/S D/D Disk 3.5)	£3.95
YJ73Q (10 S/S D/D Disk 3.5)	£34.95
FT84F (D/S D/D Disk 3.5)	£4.95
YJ74R (10 D/S D/D Disk 3.5)	£44.95

3in. Compact Diskette

NEW



Superb quality 3in. diskettes, offering a high storage density. These diskettes are suitable for use with the Amstrad computer disk drive. Double-sided, double-density.

Specification:

Magnetic material:	Finest epitaxial magnetic particles $\gamma\text{Fe}_2\text{O}_3$ with a CoFe_2O_4 surface
Outside size:	100 x 80 x 50mm
Disk diameter:	72mm
Recording capacity:	250,000bytes per side
Linear density (max):	9835bpi
Tracks per side:	40
Operating temperature range:	10° to 51.5°C
Storage temperature range:	4°C to 51.5°C

Available singly or in boxes of ten.

Order

YJ94C (3" Disk)	£4.50
YJ95D (3" Disk Box of 10)	£39.95

Floppy Disk Album

A black, leather-look album for the safe storage of up to 20 5 1/4in. mini-floppy disks. Each disk tucks into its own sleeve to be held flat and secure. The removable sleeves are transparent so that disk indexes can be read without need to remove the disk from its sleeve. Overall Size: 22 x 16 x 4.5cm.



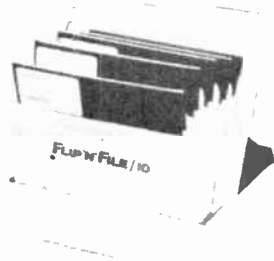
Order

YK76H (Floppy Disk Album)	£4.95
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Flip 'N' File Diskette Storage System Library Box 10

A beige plastic box for storing up to 10 mini-floppy diskettes. The lid folds up to an easel position and a hinged front panel allows easy retrieval and prevents disks having to be bent while removed. When folded down the box takes on a rectangular shape making portability easier and permitting library filing. Self adhesive labels for indexing and archive filing are included.

Overall Size: 16.5 x 16.5 x 4.2cm.



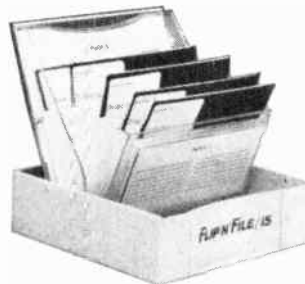
Order

YK97F (Flip n File Minibx10) £4.50

Library Box 15

Similar to the Library Box 10, but holding 15 diskettes. It has a dark, transparent, hinged plastic inner box. Base and lid are finished in beige plastic. The index cards are visible through a special window when the box is closed.

Overall Size: 17.8 x 16.5 x 5.1cm.



Order

YK87U (Flip n File Minibx15) £5.95

Keybox 25

The flip 'n' file Keybox holds up to 25 mini-floppy diskettes and stores them in a horizontal position for extended life. The opening action puts the diskettes in a vertical, easily accessible position. Each of the five compartments within the box holds five diskettes for easy retrieval and indexing. The durable plastic key and double lock system avoids the potential static charge problems associated with metal locks, yet offers excellent security. Cover and interior are of a dark transparent low-static plastic, with an attractive contrasting beige base on four anti-slip feet.

Overall size:
24.8 x 20.1 x 14cm.



Order

YK88V (Flip n File Keybox25) £24.95

Standardbox 50

A low cost, superior quality storage box for up to fifty mini-floppy diskettes, having a modern design and a functional construction. The box is made from a special smoked, transparent low-static plastic, and the cover is designed to give a smooth open/close action with complete protection against dust. Within the box there are five indexed dividers for easy retrieval. There is a handgrip on the back for carrying and the box stands on four anti-slip feet. Overall Size: 22 x 17.5 x 16.4cm.



Order

YK96E (Flip n File Box 50) £15.95

Disk Drive Cleaner



A disk drive head cleaning system which has the unusual feature of employing a cleaning fluid as opposed to entirely relying on the more usual abrasive methods. As such the 'wet' cleaning system will do much to prolong the life of the disk drive head and avoids damage to the rather critical head gap and thereby preserves the accuracy of data transference. The special disc, or 'sheet', is contained in a sealed jacket, from which it can be removed for the application of the special cleaning fluid supplied. The kit also includes the disk jacket, cleaning sheet and sleeve. Kit 5W55-S is specifically for single-sided disk drives, while kit 5W55-D is for double-sided systems. In addition, a replacement kit 5W55 is available, which contains 5 spare cleaning sheets, 2 bottles of cleaning fluid and a list on which a record can be made of successive cleaning operations and intervals between.

Order

FJ58N (Disc Drive Cleaner S) £7.95
FJ59P (Disc Drive Cleaner D) £7.95
FJ60Q (Replace Kit SW55) £4.95

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An Independent Users' Group



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Join now, don't be left out in the cold. Send a cheque/P.O. made payable to 'The UK Atari Computer Owners Club' to enrol you as a member as follows - £4.00 if you live in the U.K. or Eire, £7.00 in Europe, outside Europe surface mail £7.00, outside Europe air mail £10.50. Unless you state otherwise, you will be sent the current issue and then the next three issues as they become available.

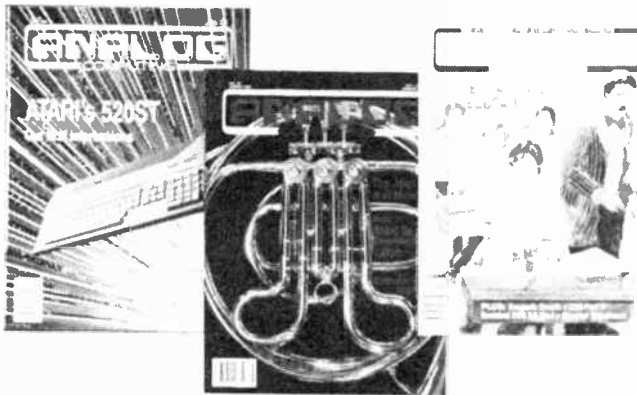
You can obtain single copies of those issues currently still available so that you can see what the club has to offer before you decide to join. Issues 4, 5, 6, 8 and 9 are available at the time of going to press.

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Atari Software

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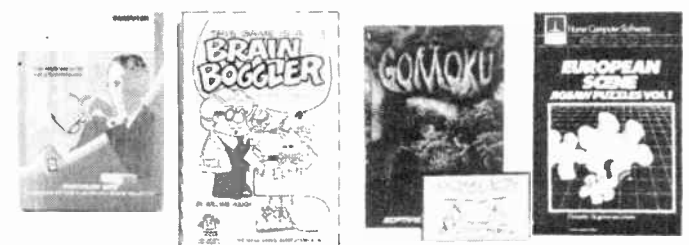
War Games For Atari



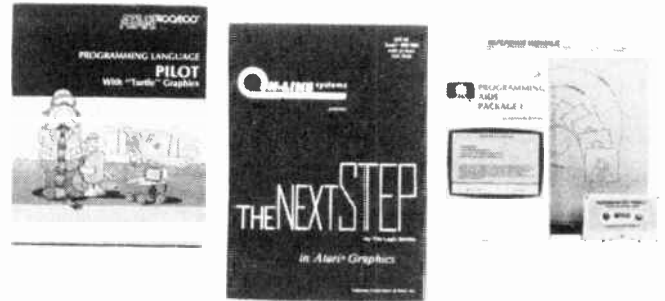
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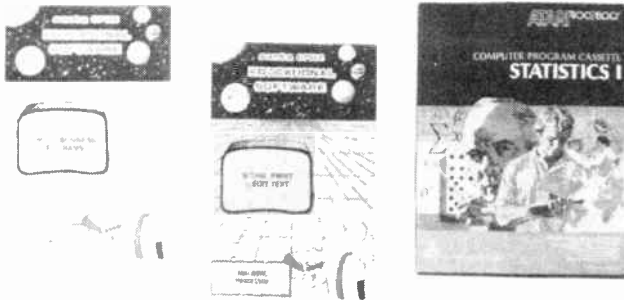
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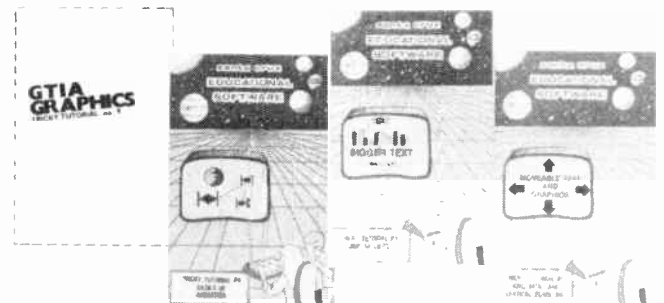
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Dragon 32 Software

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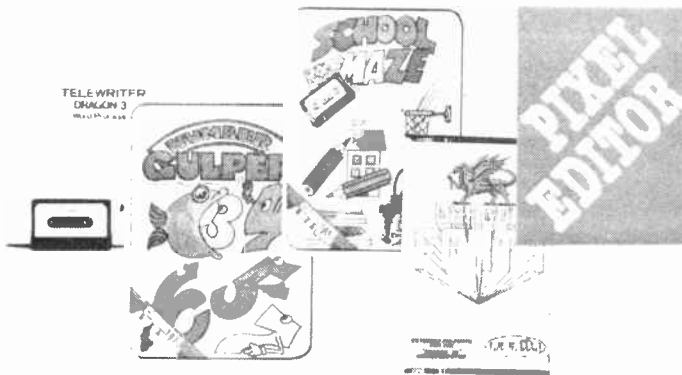
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School Maze 1C KL68Y £2.95

Utilities and Languages

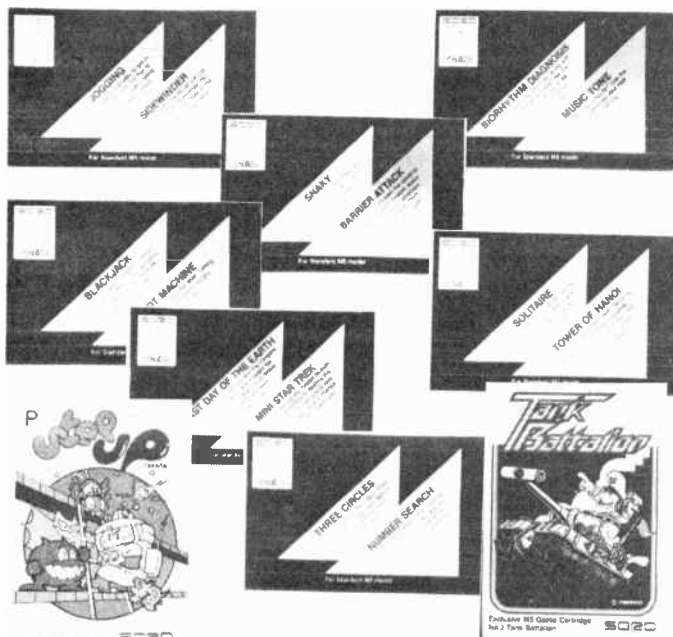
Pixel Editor 1C KL70M £3.95
FORTH 1C KL75S £9.95

Commodore 64 Software



Crush, Crumble & Chomp 1D BC61R £3.95
Temple of Apshai (Part 1) 1D BC57M £3.95
Upper Reaches of Apshai (Part 2) 1D BC58N £2.95
Coco 1C/1D KK54J £3.95

Software For CGL M5



Jogging And Sidewinder 1C KS11M £2.95
Snaky And Barrier Attack 1C KS10L £2.95
Bio-Rhythm Diagnosis And Music Tone 1C KS16S £2.95
Blackjack And Slot Machine 1C KS14Q £2.95
Solitaire And Tower Of Hanoi 1C KS12N £2.95
Three Circles And Number Search 1C KS13P £2.95
Last Day Of The Earth And Mini Star Trek 1C KS15R £2.95
Tank Battalion 1E KS03D £2.95
Step-Up 1E KS04E £2.95

Spectrum Software



Arcade Games For Spectrum

Aquarius 1C-16K KH52G £2.95
Castle 1C-16K KH53H £2.95
General Election 1C-48K KH54J £2.95
Meteor Storm 1C-16K BC91Y £2.95
Pool 1C-16K KH56L £2.95
Space Intruders 1C-16K BC90X £2.95
Specvaders 1C-16K KL97F £2.95
Styx 1C-16K KH61R £2.95

Spectrum Home Entertainment

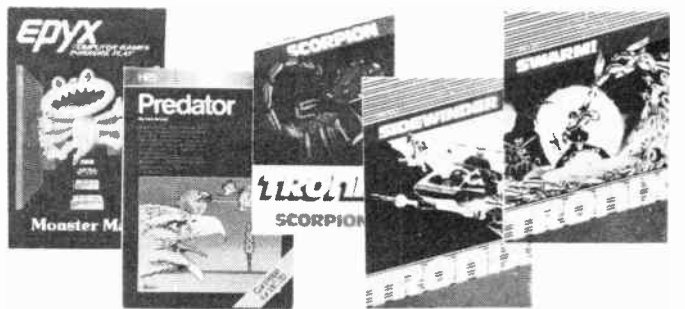
Over The Spectrum 2 1C-16K KH39N £2.95
Over The Spectrum 3 1C-16K KH40T £2.95
The Chess Player 1C-48K BC92A £3.95

VIC20 Software

Arcade Games For VIC20



Aggressor 1E KK36P £4.95
Asteroids 1C AC83E £3.95
Blitz 1C AC67X £2.95
Cosmiads 1C AC80B £2.95
Crittters 1C+8K KM06G £2.95
Deadly Skies 1E KK20W £3.95
Galactic Blitz 1C KK22Y £3.95
Gold Fever 1C KK21X £3.95
Monster Maze 1E KK11M £3.95
Martian Raider 1C BC96E £3.95



Pacacuda 1C KM17T £3.95
Predator 1E KK42V £4.95
Ricochet 1C+8K KK15R £3.95
Scorpion 1E KK19V £4.95
Shamus 1E KK39N £4.95
Shark Attack 1C BC95D £3.95
Sidewinder 1C+8K KK24B £3.95
Swarm 1C KK23A £2.95
The Catch 1C KM23A £2.95
Torg 1C KK32K £2.95
Tornado 1C+3K KM24B £3.95



Adventure Games For VIC20

Crush, Crumble & Chomp	1C+16K	KK10L	£3.95
Rescue At Rigel	1C+16K	KK08J	£3.95
Sword Of Fargoal	1C+16K	KK09K	£3.95

Home Entertainment For VIC20

Quizmaster	2C+8K	BC11M	£3.95
Strategic Advance	1C	BC48C	£2.95
Superslot	1E	AC61R	£3.95
The Robert Carrier Family Menu Planner	2C+8K	BC15R	£2.95
Type-A-Tune	1C	BC49D	£2.95

Business Programs For VIC20

Simplicalc	1D+16K	AC92A	£9.95
VICWriter	1D+8K	AC96E	£9.95



Education and General Knowledge For VIC20

Basic Medicine	1C+3K	KM42V	£3.95
Mainly For Women	1C+3K	KM43W	£2.95
Mainly For Men	1C+3K	KM44X	£2.95
All About Children	1C+3K	KM45Y	£2.95
How Healthy Are You	1C+3K	KM46A	£2.95
101 Home Nursing Tips	1C+3K	KM47B	£2.95
Know Your Own IQ	2C+8K	BC12N	£3.95
Know Your Own Personality	2C+8K	BC14Q	£2.95
Mastermind	2C+8K	BC21X	£2.95
Data 1	1C+8K	BC22Y	£1.95
Data 2	1C+8K	BC23A	£1.95
Data 3	1C+8K	BC24B	£1.95
Data 4	1C+8K	BC25C	£1.95
Wine & Food	1C+8K	BC26D	£1.95
Music	1C+8K	BC27E	£1.95
Sport & Games	1C+8K	BC28F	£1.95
Mathematics 2	2C+8K	BC00A	£2.95



Languages and Utilities For VIC20

Pixel Power	1C+8K	KM52G	£3.95
Program Aid Cartridge	1E	AC55K	£9.95

Note: C = Cassette D = Disk E = Cartridge



CONNECTORS

Adaptors	134	DIN	119	N-Series	117
Audio Leads	134	D-Type	120	PCB Connectors	123
BNC	116	Edge Connectors	122	Phono	111
Car Accessory Connectors	126	IDC Connectors	124	Single Pin Connectors	111
Car Aerial Connectors	115	Jacks	112	Telephone Connectors	130
Centronics Type	121	Mains Connectors	127	UHF	116
Co-ax	115	Model Control Connectors	126	Video Connectors	118,132
Computer Leads	133	Multiway Connectors	122	XLR Connectors	118

CLIPS Crocodile Clips



A range of crocodile clips with insulating vinyl covers in six colours, Red, Black, Yellow, Green, White and Blue. Clips are 27mm long. Overall length with sleeve 33mm.

Order

FM37S (Red Croc Clip)	8p
FK34M (Black Croc Clip)	8p
FK35Q (Yellow Croc Clip)	8p
FK36P (Green Croc Clip)	8p
FK37S (White Croc Clip)	8p
FM11M (Croc Clip Blue)	8p

Alligator Clip



A strong alligator clip with excellent grip and screw for connecting wire. Each handle is insulated red or black and has a 4mm socket in the end.

Order

HF23A (Alligator Clip Black)	18p
HF24B (Alligator Clip Red)	18p

Battery Charger Clips



Large plated clip as used on battery chargers. Overall length 75mm. Width of jaws 15mm, maximum gap between jaws when fully opened 28mm. Current rating 25A.

Order

HF26D (Charger Clip)	20p
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Test Lead Kit



A very useful pack containing ten pieces of insulated stranded wire approx. 370mm long terminated at each end by a miniature insulated crocodile clip. The insulated sleeve on the clip and the wire are the same colour and there are two leads of each of five colours: Black, Green, Red, White and Yellow.

Order

BW69A (Croc Lead Kit)	£1.98
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PUSH-ON LUCAR STYLE CONNECTORS Receptacle



Push-on receptacle for 1/4in blades. In packs of ten.

Order

HF10L (Push-On Receptacle)	28p
----------------------------	-----

Blade



Push-on 1/4in blades for above receptacle. Supplied in packs of ten.

Order

HF11M (Push-On Blade)	28p
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Covers



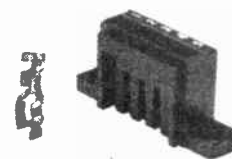
Pairs of transparent polythene covers to fit our 1/4in blades and receptacles. Covers overlap for maximum protection. Supplied in packs of ten pairs.

Order

HF12N (Push-On Covers)	68p
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Commoning Connector

A moulded plastic block to simplify commoning wires. Fix terminal to end of wire then plug into block. When plugged in, adjacent wires will be commoned.



Blocks stack together and may be linked using a link wire in one of the positions. There are five positions and blocks are mounted via 6BA (3mm) clear holes in the integral feet. Fixing centres: 35mm. Rated 12A, 250V. Overall dimensions: 41 x 10 x 19mm high.

Order

YX47B (Comcon Block 5-way)	68p
YX48C (Comcon Terminal)	8p

TERMINALS Terminal Post



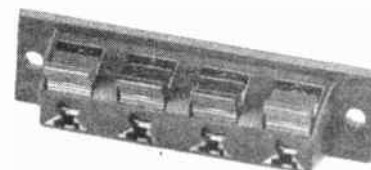
Nickel plated brass terminal post with insulation moulded in polypropylene. Rated 15A at 250V. Has a 4mm top socket.

Available in the following colours: Black, Blue, Green, Red and Yellow.

Order

HF02C (Terminal Post Black)	48p
HF03D (Terminal Post Blue)	48p
HF05F (Terminal Post Green)	48p
HF07H (Terminal Post Red)	48p
HF09K (Terminal Post Yellow)	48p

Quick Connection Lever Terminals



Spring loaded, lever action, quick connection terminals which will hold wires in a vice-like grip thereby ensuring continued continuity. These terminals are originally intended for terminating loudspeaker leads at the amplifier or speaker cabinet, but they will readily lend themselves to any similar situation where fast, convenient connection of cables are required. They are NOT suitable for connecting to the mains voltage however.

**CALL IN TO YOUR LOCAL
Maplin SHOP
in LONDON**

159 King St., Hammersmith ☎01 748 0926

The 2-way lever terminal has one red and one black lever, on a rectangular escutcheon 55mm x 21mm. Fixing centres 45mm x M3 (6BA). Max height 17mm. Solder tags (2 off) are 5mm off-centre and 19mm apart. The 4-way type has two black and two red levers, on a base 65mm x 18mm. Fixing centres 58mm. Tag spacing 13mm (4.5mm off-centre).

Order

BW72P (Lever Term 2-Way)	48p
BW71N (Lever Term 4-Way)	60p

Screw Terminals

2-Way Strip



NEW

A paxolin strip having a pair of solder tags for terminating wires to a pair of screw terminals. The strip can be attached to a panel or instrument case within a suitably shaped cutout to provide a basic, simple method of connecting cables to the instrument or equipment in question. Bare wires can be wrapped around the screws before tightening, or spade terminals can be used; the screw terminals have ears to positively locate the spades. The screws are M4 size, and suitable for use with 4BA spades and tag washers. Overall size of strip 42 x 18mm. Fixing centres 33mm. Screw/tag spacing 14.5mm.

4-Way Strip



A four way version of the above. Overall size of strip 72 x 18mm. Fixing centres 62mm. Screw/tag spacing 14.5mm.

Order

FK16S (Screw Terminal 2-Way)	18p
FK17T (Screw Terminal 4-Way)	28p

WANDER PLUGS AND SOCKETS

Miniature 1mm Size

Plug



1mm plug suitable for low voltage circuits. Strong acetal moulding and silver-plated pin. Available in red and black. Overall length: 16mm. Pin length: 6mm. Overall diameter: 6mm.

Order

WL57M (1mm Plug Black)	24p
WL58N (1mm Plug Red)	24p

Socket



1mm socket suitable for low voltage circuits. Strong acetal moulding and silver-plated contact. Available in red and black. Overall length: 16mm. Bezel diameter: 6mm. Mounting hole: 5mm dia.

Order

WL59P (1mm Socket Black)	18p
WL60Q (1mm Socket Red)	18p

2mm Size

Plug



2mm plug with silver plated pin rated at 10A. Available in black, red and yellow. Note that to unscrew body, hold in one hand and turn plastic body clockwise with other hand. Overall length: 32mm. Pin length: 9mm. Overall dia: 6mm.

Order

HF38R (2mm Plug Black)	24p
HF41U (2mm Plug Red)	24p
HF43W (2mm Plug Yellow)	24p

Socket



2mm socket with silver-plated contact, rated at 10A. Available in Black, Blue, Red and Yellow. Overall length: 19.5mm. Bezel: 6 x 6mm. Mounting hole: 5mm dia.

Order

HF44X (2mm Socket Black)	20p
HF45Y (2mm Socket Blue)	20p
HF47B (2mm Socket Red)	20p
HF49D (2mm Socket Yellow)	20p

3.2mm Split Pin Type

Plug



Nickel plated brass wander plugs with a split-pin construction. Available in Black, Green and Red. Overall length: 33mm. Pin length: 12.7mm. Pin diameter: 3.2mm. Overall diameter: 9.3mm.

Order

HF50E (Wander Plug Black)	16p
HF52G (Wander Plug Green)	16p
HF53H (Wander Plug Red)	16p

Socket



Wander socket with plated contact. Will fit panels up to 6.6mm thick. Available in Black, Green and Red. Overall length: 21mm. Bezel diameter: 11.7mm. Socket diameter: 3.3mm. Mounting hole: 8mm dia.

Order

HF56L (Wander Socket Black)	16p
HF58N (Wander Socket Green)	16p
HF59P (Wander Socket Red)	16p

4mm Size

Plug



4mm plug with nickel alloy plated brass pin and stainless steel spring to maintain adequate pressure in 4mm sockets. Available in Black, Blue, Green, Red, White and Yellow. Overall length: 44mm. Pin length: 19mm. Overall diameter: 8mm.

Order

HF62S (4mm Plug Black)	24p
HF63T (4mm Plug Blue)	24p
HF65V (4mm Plug Green)	24p
HF66W (4mm Plug Red)	24p
HF67X (4mm Plug White)	24p
HF68Y (4mm Plug Yellow)	24p

Socket



4mm socket with silver-plated contact. Available in Black, Blue, Green, Red, White and Yellow. Overall length: 29.2mm. Bezel diameter: 11.7mm. Mounting hole: 8mm dia.

Order

HF69A (4mm Socket Black)	20p
HF70M (4mm Socket Blue)	20p
HF72P (4mm Socket Green)	20p
HF73Q (4mm Socket Red)	20p
HF74R (4mm Socket White)	20p
HF75S (4mm Socket Yellow)	20p

Patch Cord



A red and black patch cord pair. Terminated each end in moulded 4mm plugs with 4mm socket in the plug. Heavy duty extra-flexible PVC covered wire 900mm long.

Order

HF34M (4mm Patch Cord)	£1.95
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PHONO PLUGS AND SOCKETS

Plastic Plug



A phono plug with a smart screw on plastic cap. Available in Black, Blue, Red, White and Yellow. Overall length: 34mm. Pin length: 9mm. from end of shield. Overall diameter: 11.5mm.

Order

HQ54J (Screw-Cap Phono Blk)	12p
HQ55K (Screw Cap Phono Blue)	12p
HQ58N (Screw Cap Phono Red)	12p
HQ59P (Screw Cap Phono White)	12p
HQ60Q (Screw Cap Phono Yell)	12p

Plastic Plug With Strain Relief Sleeve

STAR BUY



A phono plug having a coloured plastic screw-on body. When the body is unscrewed the threaded moulding on the plug is exposed, which is colour matched to the body. The body is of octagonal section and includes a strain relief sleeve. Available in red and black.

Order

FJ88V (Phono Plug Red)	15p
FJ89W (Phono Plug Black)	15p

Metal Barrel Plug



A phono plug with a metal barrel and plastic strain relief sleeve.

Order

HH01B (Metal Phono)	24p
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Gold Phono Plug



A very high quality screened phono plug having a gold plated body and gold plated contact surfaces for maximum contact reliability, plus strain relief sleeve.

Order

FK18U (Gold Phono Plug Scr)	78p
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0702 552911



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Right Angled Plastic Plug



A right-angled phono plug having a black plastic body with strain relief sleeve.

Order
FJ74R (R/A Phono Plug) 35p

Single-Hole Fixing Chassis Socket



A chassis mounting phono socket that requires a single hole fixing. Mounting hole: 6.35mm dia.

Order
YW06G (Threaded Phono Skt) 20p

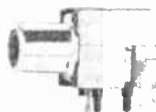
Gold Phono Socket



A chassis mounting phono socket with gold-plated contact surfaces for ultimate reliability. Single hole fixing. Mounting hole: 6.3mm dia.

Order
FT95D (Gold Chas Phono Skt) 40p

PCB Mounting Phono Socket



A compact phono socket which mounts directly onto printed circuit boards. Dimensions: 22 x 15 x 10mm.

Order
HF99H (PCB Phono Skt) 30p

Chassis Sockets



Chassis mounting phono sockets on paxolin mountings. Various sizes are available.

No. of sockets	Dimensions of mount	Fixing centres
1	24mm dia	18mm
2	38 x 25mm	30 x 12.5mm
4	76 x 27mm	65 x 13mm
6	92 x 27mm	85 x 20mm

Order
HH02C (Phono Socket Single) 15p
HH03D (Phono Socket Twin) 20p
BW74R (Phono Socket Quad) 44p
BW76H (Phono Socket 6-way) 54p

Plastic Line Socket



An in-line plastic barrel phono socket with strain relief sleeve.

Order
FJ90X (Line Phono Skt Blk) 15p

Metal Barrel Line Socket



An in-line metal barrel phono socket with strain relief sleeve.

Order
HH04E (Line Phono) 24p

Line Connector



A metal barrel adaptor for connecting together two phono plugs.

Order
HH05F (Phono Conn) 24p

2.5mm JACK PLUGS AND SOCKETS

Plastic Barrel Plug



2.5mm Jack plug with plastic barrel.

Order
HF76H (2.5 Plug Plas) 18p

Screened Plug



2.5mm Jack plug with metal barrel.

Order
HF77J (2.5 Plug Scr) 22p

Stereo Plastic Barrel Plug



2.5mm stereo Jack plug with plastic barrel.

Order
FJ85G (Stereo 2.5mm Jack Pl) 28p

Chassis Socket



2.5mm Jack socket, open-type with break contact. Mounting hole: 5mm dia.

Order
HF78K (2.5 Jack Socket) 18p

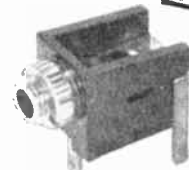
Stereo Chassis Socket



A stereo chassis mounting 2.5mm socket in a tubular metal screen. Mounting hole: 6.3mm dia.

Order
FT94C (2.5 Stereo Chas Skt) 24p

PCB Mounting Socket



A 2.5mm mono jack socket having a knurled fixing nut for panel mounting in addition to solder tags suitable for insertion into drilled holes in a printed circuit board. The holes need to be 1.4mm diameter minimum. The socket also has a break action contact to a third pin on insertion of the plug. Pins are spaced 10mm, the third break contact pin being 4mm off-centre. Overall height from PCB is 9mm.

Order
FK01B (PCB 2.5mm Jack Skt) 15p

Line Socket



A 2.5mm mono line jack socket with plastic barrel and strain relief sleeve.

Order
HF79L (2.5 Line Socket) 18p

Stereo Line Socket



A stereo 2.5mm line socket with plastic body and strain relief sleeve.

Order
FT93B (2.5 Stereo Line Skt) 20p

3.5mm JACK PLUGS & SOCKETS

Plastic Barrel Mono Plug



A mono 3.5mm jack plug with a plastic barrel and strain relief sleeve.

Order
HF80B (Plug Plas 3.5) 18p

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in **SOUTHAMPTON**
46 Bevois Valley Road. ☎0703 225831

Right-Angled Mono Plug



A right angled mono 3.5mm jack plug with snap-on cover and solder terminals.

Order
FA37S (R/A 3.5mm Plug) 30p

Lockable Mono Plug and Socket



A 3.5mm mono jack plug in a metal barrel, having a threaded locking ring to firmly attach the plug to the matching socket. The fixing nut of the single hole mounting socket is threaded for the ring, and has flats for tightening with pliers or spanner. Plug has coil strain relief sleeve. Mounting hole for socket: 6mm dia.

Order
FV03D (Lck 3.5 Jack Plug) 58p
FV04E (Lck 3.5 Jack Skt) 40p

Plastic Stereo Plug



A 3.5mm stereo jack plug with plastic barrel and strain relief sleeve.

Order
HF98G (Stereo Plas 3.5 Plug) 28p

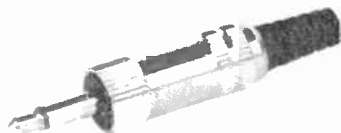
Right-Angled Stereo Plug



A right-angled stereo 3.5mm jack plug.

Order
FA38R (R/A 3.5mm Stereo Plug) 39p

Metal Barrel Plug



A mono 3.5mm jack plug in a metal barrel with plastic strain relief sleeve.

Order
HF81C (Plug Metal 3.5) 22p

Stereo Metal Barrel Plug



A 3.5mm stereo jack plug with a metal barrel with a plastic strain relief sleeve.

Order
FJ99H (Mtl Stereo 3.5mm Jk) 35p

Chassis Socket Mono

An open mono 3.5mm jack socket with break contact. Mounting hole: 6.3mm dia.



Order
HF82D (Jack Socket 3.5) 18p

Stereo Chassis Socket

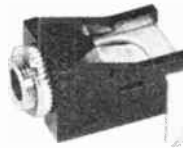
A stereo 3.5mm chassis socket in a tubular metal screen. Mounting hole 6.3mm dia.



Order
FK03D (Ster 3.5mm Ch Jk Skt) 28p

PCB Mono Socket

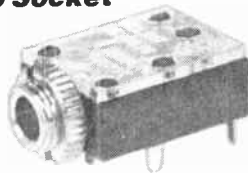
A PCB mounting mono 3.5mm jack socket which includes the facility for chassis mounting (6.3mm dia.)



Order
FK02C (PCB 3.5mm Jack Skt) 18p

PCB Stereo Socket

A PCB mounting stereo 3.5mm jack socket similar to the mono PCB socket above.



Order
FK20W (PCB 3.5mm Ste Jk Skt) 38p

Plastic Barrel Line Socket

A mono 3.5mm line socket in a plastic barrel with strain relief sleeve.



Order
HF83E (Line Socket Plas 3.5) 18p

Stereo Line Socket



A 3.5mm stereo line socket with plastic body and strain relief sleeve.

Order
RK51F (Stereo Plas 3.5 Skt) 28p

Screened Line Socket



A 3.5mm mono jack line socket in metal barrel with plastic strain relief sleeve.

Order
HF84F (Line Socket Scr 3.5) 28p

Stereo Screened Socket



A stereo 3.5mm line socket in a metal barrel with plastic strain relief sleeve.

Order
FK04E (Ster Scr 3.5mm Ln Skt) 38p

1/4in JACK PLUGS & SOCKETS

Plastic Barrel Mono Plug

STAR BUY



Standard 1/4in mono jack plug in plastic barrel with strain relief sleeve.

Order
HF85G (Jack Plug Plas) 27p

Side Entry Mono Jack Plug



Standard 1/4in mono right-angled side entry jack plug with plastic cover.

Order
HF86T (Side Jack Plas) 32p

Metal Barrel Mono Plug



Standard 1/4in mono Jack plug in a metal barrel with plastic strain relief sleeve.

Order
HF87U (Jack Plug Metal) 44p

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Access, Visa, American Express, Mapcard.
 Phone before 2pm for same day despatch.

★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

Screened Mono Plug with Spring Cable Relief



Standard 1/4in mono screened jack plug with metal body and coiled spring cable relief sleeve.

Order
YW07H (SR Jack Plug) 49p

Gold 1/4in Jack Plug



A gold plated 1/4in mono jack plug with a metal barrel and coil spring cable strain relief.

Order
FJ86T (Gold Mono 1/4in Jack) £1.95

Screened Side Entry Mono Plug



Standard 1/4in right-angled side entry mono jack plug with a metal body.

Order
YL03D (Side Jack Screened) 24p

Lockable Plug and Socket



A standard 1/4in. mono jack plug with metal barrel and coiled strain relief sleeve. The plug has a threaded locking ring to firmly attach it to the matching socket, which has a fixing nut threaded for the ring. The chassis socket is single hole mounting requiring a 9.5mm (3/8in.) dia. hole.

Order
FV05F (Lck Standrd Jack Plg) 85p
FV06G (Lck Standrd Jack Skt) 74p

Plastic Barrel Stereo Plug



A standard 1/4in stereo jack plug with plastic barrel and strain relief sleeve.

Order
HF88V (Jack Pl Sto Plas) 36p

Stereo Side Entry Jack



Standard 1/4in stereo side entry jack plug with plastic body.

Order
FK00A (Stereo R/A 1/4in Jk) 42p

Metal Barrel Stereo Plug



A standard 1/4in stereo Jack plug with a metal barrel and plastic strain relief sleeve.

Order
HF89W (Jack Pl Sto Metal) 54p

Gold Plated Stereo Jack Plug



A gold plated stereo 1/4in jack plug, having a plated barrel in addition to plated contact areas, plus a coil spring strain relief sleeve.

Order
FM12N (Gold Stereo 1/4in Jk) £2.30

Moulded Mono Chassis Socket Plastic Bezel

Standard 1/4in moulded Jack socket with 2 break contacts. Mounting hole: 11mm dia. Available with solder tags or PCB mounting pins.



Order
HF90X (Jack Skt Brk) 24p
FJ00A (Mono PCB 1/4" J/Skt) 28p

Moulded Mono Chassis Socket Chromed Bezel

Standard 1/4in moulded Jack socket with 2 break contacts. Bezel is domed and chromed. Mounting hole: 11mm dia.



Order
BW78K (Chro Mono Jack Skt) 38p

Open Mono Chassis Socket

Standard 1/4in open-type mono Jack socket. Mounting hole: 9.5mm dia.



Order
HF91Y (Jack Skt Open) 28p

Moulded Stereo Chassis Socket Plastic Bezel

Standard 1/4in moulded stereo Jack socket with 3 break contacts. Mounting hole: 11mm dia. Available with solder tags or PCB mounting pins.



Order
HF92A (Jack Skt Sto) 28p
FJ05F (Stereo PCB 1/4" J/Sk) 32p

Moulded Stereo Chassis Socket Chromed Bezel

Standard 1/4in moulded stereo Jack socket with 3 break contacts. Bezel is domed and chromed and contacts are nickel silver. Mounting hole: 11mm dia.



Order
BW79L (Chro Stereo Jack Skt) 38p

Open Stereo Socket

Standard 1/4in open-type 3-pole stereo Jack socket. Mounting hole: 9.5mm dia.



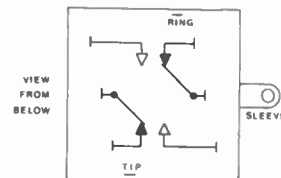
Order
HF93B (Stereo Open Skt) 38p

DPDT Jack Socket



A standard 6.3mm (1/4in) stereo Jack socket with two changeover contacts which are not connected to the plug when it is inserted, 9 contacts. Ideally suited as headphone outlet on amplifier, with switches used to change main output from speakers to dummy loads. Mounting hole: 9.5mm dia.

Order
BW80B (DPDT Jack Socket) 58p



CALL IN TO YOUR LOCAL
Maplin SHOP
in MANCHESTER
8 Oxford Road. ☎061 236 0281

DPDT PCB Jack Socket



A standard 1/4in stereo PCB mounting jack socket with internal DPDT contacts.

Order
FJ87U (Sw PCB Stereo Jk Skt) 78p

Plastic Barrel Mono Line Socket



A standard 1/4in mono line socket with plastic barrel and strain relief sleeve.

Order
HH19V (Line Jack Plas) 28p

Screened Mono Line Socket



Standard 1/4in mono line socket with metal barrel and plastic strain relief sleeve.

Order
HH20W (Scr Line Jack) 48p

Plastic Barrel Stereo Line Socket



A standard 1/4in stereo line socket with plastic barrel and strain relief sleeve.

Order
HH21X (Stereo Line Skt) 30p

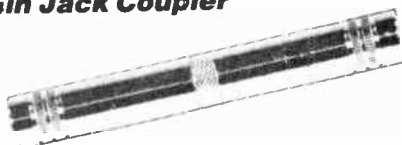
Screened Stereo Line Socket



A standard 1/4in stereo line socket with a metal barrel and plastic strain relief sleeve.

Order
HH22Y (Scr Stereo Line Skt) 58p

1/4in Jack Coupler



A screened metal-barrelled coupler for joining two mono 1/4in jack plugs.

Order
FK80B (Mono 0.25in Jk Cplr) 48p

CO-AXIAL PLUGS AND SOCKETS

Metal Plug



A standard co-ax plug with aluminium body and cap.

Order
HH07H (Co-ax Plug Aly) 28p

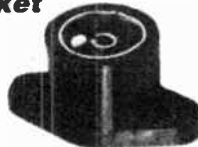
Plastic Plug



A standard co-ax plug with plastic covered body and plastic cap. Improved design to meet low loss European specification.

Order
YW08J (Co-ax Plug Plas) 18p

Chassis Socket



A panel mounting socket which protrudes above the chassis surface. Fixing centres: 19mm x 6BA clear

Order
HH08J (Co-ax Socket Pan) 28p

Flush Socket



A panel mounting socket which fits flush to the chassis surface. Panel cut-out: 12.7mm. Fixing centres: 19mm x 6BA clear.

Order
HH09K (Co-ax Socket Flush) 28p

Line Socket



A standard co-ax in-line socket with aluminium body and cap.

Order
YW09K (Co-ax Line Skt) 38p

Line Connector

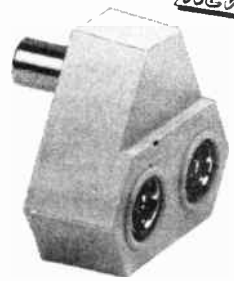


A line connector for connecting two co-ax plugs together.

Order
HH11M (Co-ax Conn) 18p

Two into One Adaptor

NEW



A simple plug in two into 1 adaptor for splitting or combining coaxial feeders.

Order
FT85G (2 Into 1 Coax Adptr) £1.10

CAR AERIAL CONNECTORS

Skeleton Plug



A skeleton-type plug which fits the aerial sockets fitted to most car radios.

Order
HH13P (Skeleton Car Plug) 18p

Plastic Plug



A car aerial plug similar to the skeleton plug above, but with plastic body and screw-on cap.

Order
HH12N (Car AE Plug Plas) 28p

Line Socket



A line socket for extending a car aerial lead.

Order
FJ76H (Car AE Line Skt) 38p

In-line Plug Adaptor



A two way in-line adaptor for joining two car aerial plugs.

Order
FJ75S (Inline Car AE Adapt) 38p

Socket



A chassis mounting socket to suit above car plugs. As fitted on many car radios. Panel cut-out: 12.7mm. Fixing centres: 20mm x 6BA clear.

Order
HH14Q (Chassis Car Socket) 24p

FM AERIAL PLUG



Moulded plugs for connecting aeri-als to radiograms etc.

Order

HH16S (FM Aerial Plug) 18p

BNC SERIES PLUGS AND SOCKETS (50Ω)

A range of BNC series plugs, sockets and adaptors having a nominal impedance of 50Ω. Both plugs and sockets will mate with 75Ω types. Silver plated brass.

Peak working voltage: 500V
Max frequency: 5000MHz
Suits cable UR76.

Free Plug



Order

HH17T (BNC Plug) 98p

Right Angled Free Plug



A right-angled BNC plug with plastic body and strain relief sleeve, and solderless cable connections.

Order

FJ72P (BNC R/A Plug) £1.20

Round Chassis Socket

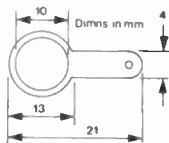


Requires 9.7mm diameter panel cut-out.

Order

HH18U (BNC Socket) 95p

BNC Earth Tag

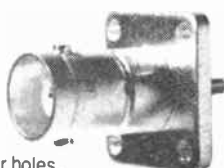


A solder tag for use with the Round Chassis Socket for earth connections to chassis.

Order

QY22Y (BNC Earth Tag) 18p

Square Chassis Socket



Fixing centres 12.7 x 12.7mm. 6BA (M3) clear holes.

Order

YW00A (BNC Square Socket) 98p

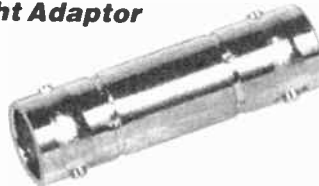
Free Socket



Order

YW01B (BNC Line Socket) £1.10

Straight Adaptor

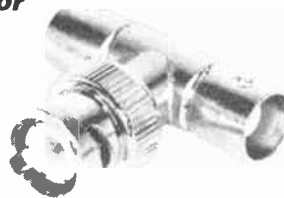


Two Free Plugs may be connected together with this adaptor.

Order

YW02C (BNC Straight Adaptor) £1.48

'T' Adaptor



Two Free Plugs may be connected together then connected to one socket with this adaptor.

Order

YW03D (BNC T Adaptor) £2.45

BNC to Phono Adaptor NEW



A BNC plug to phono socket adaptor enabling a phono plug to be used with a BNC socket.

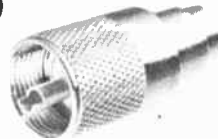
Order

FA11M (Phono Skt BNC Plg) 74p

UHF SERIES PLUGS AND SOCKETS

A range of 'uhf' type high quality plugs and sockets. The nominal impedance is 50Ω, but this is not constant and although satisfactory up to 200MHz caution should be exercised between 200 and 500MHz. Working voltage: 500V peak. (Note that all 'uhf' series connectors of all makes have a non-constant impedance).

Plug (PL259)



Suits cable UR67. Size 38 x 19mm dia. Cable entry hole: 11mm dia.

Order

BW81C (Plug PL259) 54p

Right Angled UHF Plug (PL259)



A right-angled UHF plug in a plastic body with strain relief sleeve, and solderless cable connections.

Order

FJ73Q (UHF R/A Plug) 68p

Reducer Small



Screws into plug PL259 to enable it to be used with cables around 5.3mm dia. e.g. UR76.

Order

BW82D (UHF Reducer Small) 12p

Reducer Large



Screws into plug PL259 to enable it to be used with cables around 6.4mm dia.

Order

BW83E (UHF Reducer Large) 14p

Right-Angle Plug (PL259)



A standard PL259 plug with a right angle cable input and reducer for connection to RG58/UR76-type cable.

Order

HL95D (RA PL259 Plug) 80p

Round Socket



Mounting hole: 16.5mm dia.

Order

BW84F (UHF Socket Round) 60p

Square Socket



Cut-out 16.5mm dia. Fixing centres: 18 x 18mm x 6BA (M3) clear

Order

BW85G (Socket SO239) 54p

PHONE NOW
0702 552911

Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Elbow Adaptor



A right-angle coupler. PL259 to SO239

Order

BW86T (UHF Elbow Adaptor) £1.95

Straight Adaptor



Adaptor to couple two PL259 plugs together.

Order

BW87U (UHF Straight Adaptor) 48p

'T' Adaptor



Adaptor to couple two PL259 plugs and then join them to an SO239 socket.

Order

BW38V (UHF T Adaptor) £1.95

Female 'T' Adaptor



Adaptor to couple three PL259 plugs together.

Order

RK00A (UHF Female T Adaptor) £1.80

Lightning Arrester Adaptors

On both these adaptors a terminal is attached for connection to earth. In the event of a lightning strike, the current is diverted to earth thus protecting the equipment. Two types are available.

Female/Female



A straight through adaptor for connecting two PL259 plugs together with provision for connecting an earth wire.

Order

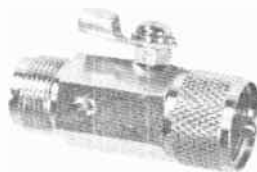
RK01B (UHF Adaptor FFLA) £1.60

**PHONE NOW
0702 552911**



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Male/Female



A straight through adaptor for connecting a PL259 plug to an SO239 socket, but with provision for connecting an earth wire.

Order

RK02C (UHF Adaptor FMLA) £1.80

BNC/UHF INTER-SERIES ADAPTORS

BNC Male/UHF Female

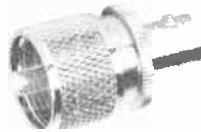


A BNC plug internally connected to a UHF SO239 socket.

Order

YW04E (Adaptor 239) £1.45

UHF Male/BNC Female



A BNC socket internally connected to a UHF PL259 plug.

Order

YW05F (Adaptor 259) £1.45

N SERIES PLUGS AND SOCKETS

Constant impedance 50Ω coaxial connectors, distinguished from the UHF style connectors by having a larger diameter. N series connectors are suitable for frequencies up to 10,000MHz, and have insulation strength up to 1000V peak. These connectors have a pressure-sleeve cable clamping system using compressible silicone rubber sealing gaskets. The bodies are silver-plated brass, as are all the male contacts; female contacts are beryllium-copper.

N Type Plugs



Two N type coaxial plugs, to suit two sizes of coaxial cable.

Plug N-050 is compatible with coaxial cable of 5mm diameter, such as the Low C Cable/UR76.

Plug N-011 is compatible with heavy duty RF cable of 10/11mm dia., such as the UR67 RF Cable.

Order

FJ77J (Plug N-050) £2.45
FJ78K (Plug N-011) £2.60

N Type Chassis Socket

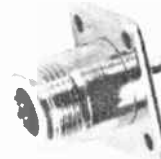


A single hole fixing N type chassis mounting socket, requires 16mm dia. cutout. Earth tag included.

Order

FJ79L (N Type Chassis Skt) £1.45

Square Chassis Socket



Requires 16mm round cutout. Fixing centres: 18 x 18mm x 6BA (M3) clear.

Order

FJ80B (N Type Chass Skt Sq) £1.20

N Type In-line Adaptor



An inline adaptor for joining two N type Plugs.

Order

FJ81C (N Type Inline Adapt) £1.95

N Male to BNC Female Adaptor



Allows a BNC plug to be used with an N type chassis socket.

Order

FJ82D (N Male to BNC Adapt) £2.45

BNC Male to N Female Adaptor



Allows an N type plug to be used with a BNC socket.

Order

FJ83E (BNC Male to N Adapt) £1.95

BNC Female to N Female Adaptor



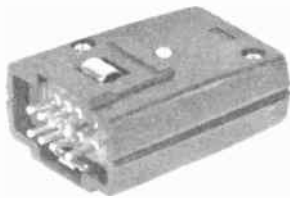
Allows a BNC plug to be connected inline with an N type plug.

Order

FJ84F (BNC Female to N Fem) £1.95

VIDEO CONNECTORS

EIA 8 Pin Video Plug

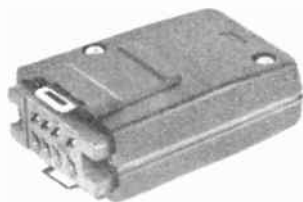


An 8-pin video plug connector to EIA standard with smart plastic body with sprung locking catches and cable clamp.

Order

FJ70M (8 Pin EIA Plug) £2.50

EIA 8 Pin Video Line Socket

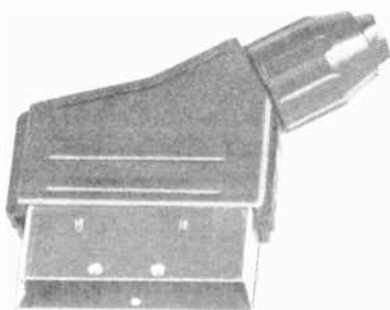


An 8-pin line socket to match the 8pin plug above. Socket has two slotted metal catches for the sprung latching mechanism of the plug.

Order

FJ71N (8 Pin EIA Skt) £1.98

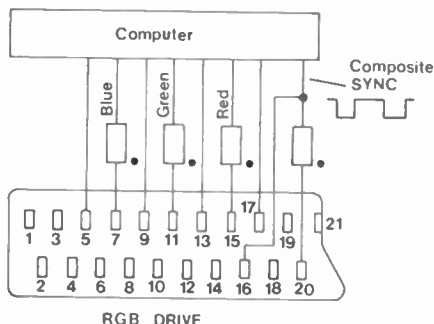
SCART Euro Video Plug



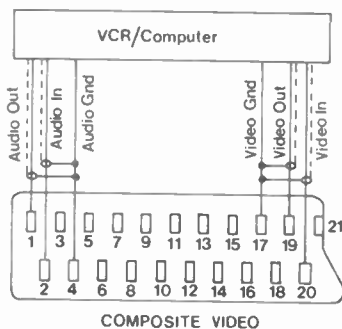
The new international and European standard multiway interface connector for coupling micro-computers to the latest TV sets and VDU's having the SCART style socket ready built-in.

Connections to the SCART plug for RGB drive video, plus audio (some of the more popular home computers).

Typical pin connection details



Pin connections for composite video with separate audio (popular home computers and certain video cassette recorders which are SCART compatible).



NOTE only video recorder outputs labelled 'Video Out' and 'Audio Out' must be used.

Terminal Identification

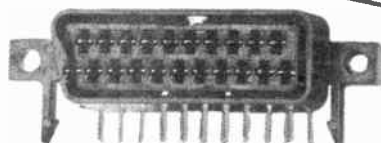
Pin Number	Function
2,6	Composite video:
2,6	Audio in
1,3	Audio out
4	Audio ground (0V and screen)
20	Composite video in
19	Composite video out

Pin Number	Function
RGB:	
15	Red in
13	Red ground
11	Green in
9	Green ground
7	Blue in
5	Blue ground
16	Status RGB input (fast blanking)
8	Status composite video input

Order

FJ41U (Scart Plug (21 way)) 98p

SCART Video Socket

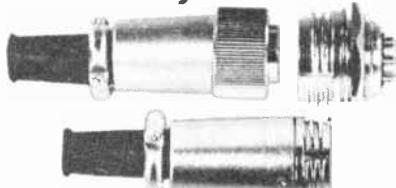


A right-angled, PCB mounting socket that will directly accept the Euro Video SCART plug. The socket also has fixing centres at 58mm x M3.5 for screwing to a panel etc. Cut-out 48 x 17mm.

Order

FV89W (SCART Socket) 50p

Round 10-Way



A high quality set of plugs and sockets, mainly for use as video camera connectors. Connectors are keyed and a screw locking mechanism locks them tightly in place. Line socket overall length is 66.5mm, diameter 20mm. Line plug overall length is 70mm, diameter 23mm. Chassis mounting socket length is 18mm, and requires a 20mm diameter panel cut-out.

Order

RK52G (10 Way Line Skt) £3.45
RK53H (10 Way Line Plug) £4.25
RK54J (10 Way Chassis Skt) £1.95

AUDIO LOCKING CONNECTORS

Chassis Plug / Line Socket



A range of high quality audio connectors with die-cast metal housings and plated brass contacts. Connectors are keyed and a screw locking mechanism locks the connector into place. Line socket has an integral cable clamp. Chassis mounting plug requires a 16mm diameter panel cutout. Line socket overall length: 37mm, diameter 18mm. Current rating: 5A at 240V AC. Plugs and sockets supplied separately. Available in 2, 3, 4, 5, 6, 7 and 8 ways.

Order

FM50E (Lkg Audio Plug 2-Way) 55p
FK22Y (Lkg Audio Skt 2-Way) 55p
FM51F (Lkg Audio Plug 3-Way) 65p
FK23A (Lkg Audio Skt 3-Way) 65p
FM52G (Lkg Audio Plug 4-Way) 80p
FK24B (Lkg Audio Skt 4-Way) 80p
FM53H (Lkg Audio Plug 5-Way) 95p
FK25C (Lkg Audio Skt 5-Way) 95p
FM54J (Lkg Audio Plug 6-Way) 98p
FK26D (Lkg Audio Skt 6-Way) 98p
FK27E (Lkg Audio Plug 7-Way) 98p
FK28F (Lkg Audio Skt 7-Way) 98p
FK29G (Lkg Audio Plug 8-Way) 98p
FK30H (Lkg Audio Skt 8-Way) 98p

Chassis Socket / Line Plug



Identical to the above connectors, but with a line plug and chassis socket. Available only in 10-way.

Order

FT91Y (Lkg Audio Plg 10-Way) £2.50
FT92A (Lkg Audio Skt 10-Way) £1.50

XLR-TYPE CANNON-TYPE CONNECTORS

Metal Body

Professional quality connectors for use on audio and test equipment etc. The strong metal housings are sandblasted die-cast zinc then copper and nickel plated. Contacts are brass, mercury dipped then silver-plated. Self-adjusting strain-relief sleeves on line plug and socket will accommodate cables from 4 to 7mm dia. preventing damage to cable sheath up to 50kg stress. Cable clamp has no metal parts and no screws.

Current rating: 15A at 120V AC
 Contact resistance: 5mΩ max
 All parts are latching and will mate with other 3-pin XLR connectors.

CALL IN TO YOUR LOCAL
Maplin SHOP
in BIRMINGHAM

Lynton Square, Perry Barr. ☎021 356 7292

*Adjust values for required signal level.

3-Pin Plug



Overall length: 87mm. Diameter: 19mm.

Order

BW89W (XLR Line Plug) £1.85

3-Pin Chassis Socket

Mounting hole: 24mm dia.
Bezel: 27 x 36.5mm.
Fixing centres: 26 x 17mm
x M3 countersunk.
Overall depth (excl.
latch release): 37mm.



Order

BW90X (XLR Chassis Socket) £2.95

3-Pin Line Socket

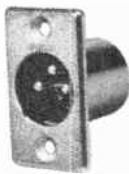


Overall length: 101mm. Diameter: 19mm. (excl. latch release).

Order

BW91Y (XLR Line Socket) £1.95

3-Pin Chassis Plug



Mounting hole: 19mm dia.
Bezel: 22 x 36.5mm.
Fixing centres: 27mm x M3 countersunk.
Overall depth: 25mm.

Order

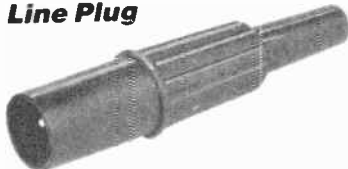
BW92A (XLR Chassis Plug) £1.70

Nylon Body

Identical to the XLR Cannon type connectors but made in matt black, glass-filled nylon as a budget priced alternative. These British made connectors offer studio quality at a low price. The line plugs and sockets are held together with a single pozi-drive screw, and include a cable grip/strain relief that will accept cables up to 7mm dia. Simply slip the cover onto the cable, then the cord grip, and after soldering the wires to the pins, position the grip 37mm behind the pins' body and pull the cable back through the cover. Line up the screw holes in body and cover and attach with screw, but DO NOT overtighten. These connectors are non-latching.

Current rating: 15A at 120V AC
Contact resistance: 5 mΩ max

3-Pin Line Plug



Overall length: 92mm. Diameter: 22mm

Order

BK98G (Bdgt XLR Line Plug) £1.30

3-Pin Line Socket

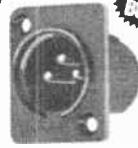


Overall length: 94.5mm. Diameter: 22mm

Order

BK99H (Bdgt XLR Line Skt) £1.30

3-Pin Chassis Plug

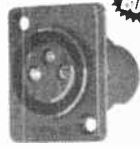


Mounting hole: 21.3mm dia. Bezel: 26 x 32mm.
Fixing centres: 24 x 18mm x M3 countersunk.
Overall depth: 25.5mm.

Order

FG76H (Bdgt XLR Chas Plug) 95p

3 Pin Chassis Socket

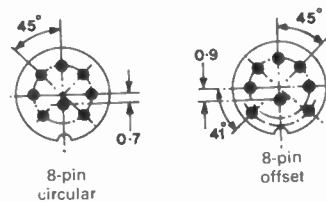
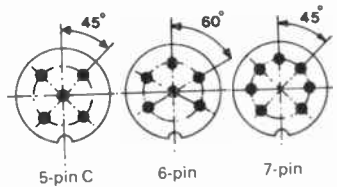
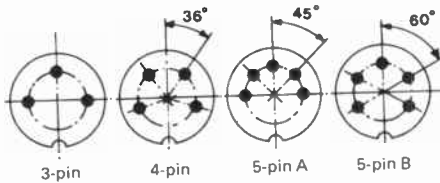


Mounting Hole: 21.3mm dia. Bezel: 26 x 32mm.
Fixing centres: 24 x 18mm x M3 countersunk.
Overall depth: 25.5mm

Order

FG77J (Bdgt XLR Chas Skt) £1.10

DIN PLUGS AND SOCKETS



Plugs



2-Pin plug

Order

HH24B (DIN L/S Plug) 14p



2-Pin plug with screw terminals.

Order

FM42V (Sidrls 2-Pin DIN Plg) 20p



2-Pin right-angle plug with screw terminals

Order

FM40T (R/A 2-Pin DIN Plug) 20p

3-Pin plug

Order

HH25C (DIN Plug 3-pin) 20p



4-Pin plug

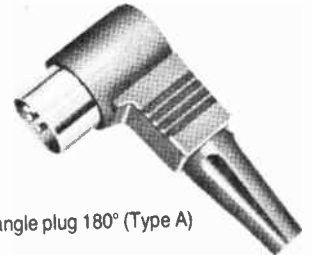
Order

HH26D (DIN Plug 4-pin) 20p

5-Pin plug 180° (Type A)

Order

HH27E (DIN Plug 5-pin A) 20p



5-Pin right-angle plug 180° (Type A)

Order

FM44X (R/A 5-Pin DIN A Plug) 28p

5-Pin plug 240° (Type B)

Order

HH28F (DIN Plug 5-pin B) 24p

5-Pin plug 360° domino (Type C)

Order

RK64U (DIN Plug 5-pin C) 24p



6-Pin plug

Order

HH29G (DIN Plug 6-pin) 24p

7-Pin plug

Order

HH30H (DIN Plug 7-pin) 24p

8-Pin plug offset

Order

FG40T (DIN Plug 8-pin Offset) 48p

8-Pin plug circular

Order

FJ91Y (DIN Plug 8-Pin Circ) 48p

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

Chassis Sockets

2-Pin socket



Order
HH31J (DIN L/S Socket) 10p

3-Pin socket

Order
HH32K (DIN Socket 3-pin) 15p

4-Pin socket

Order
HH33L (DIN Socket 4-pin) 18p



5-Pin socket 180° (Type A)

Order
HH34M (DIN Socket 5-pin A) 18p

5-Pin socket 240° (Type B)

Order
HH35Q (DIN Socket 5-pin B) 18p

5-pin socket 360° domino (type C)

Order
FJ92A (DIN Socket 5-pin C) 20p

6-Pin socket

Order
HH36P (DIN Socket 6-pin) 20p



7-Pin socket

Order
HH37S (DIN Socket 7-pin) 28p

8-pin socket offset

Order
FJ93B (DIN Skt 8-Pin Offset) 48p

8-pin socket circular

Order
FJ94C (DIN Skt 8-Pin Circ) 48p

DIN In-Line Sockets

2-Pin line socket

Order
HH40T (DIN Line Skt 2-pin) 15p



2-Pin line socket with screw terminals

Order
FM43W (SldrIs 2-Pin DIN Skt) 18p

2-Pin right-angle line socket with screw terminals



Order
FM41U (R/A 2-Pn DIN Line Sk) 18p

3-Pin line socket



Order
HH41U (DIN Line Scket 3-pin) 24p

4-pin line socket

Order
HH42V (DIN Line Scket 4-pin) 24p

5-Pin line socket 180° (Type A)

Order
HH43W (DIN Line Skt 5-pin A) 24p

5-pin line socket 240°

Order
HH44X (DIN Line Skt 5-pin B) 24p

5-pin line socket 360° domino

Order
FJ95D (DIN Line Skt 5-Pin C) 24p

6-Pin line socket

Order
HH45Y (DIN Line Scket 6-pin) 24p

7-pin line socket

Order
HH46A (DIN Line Scket 7-pin) 28p

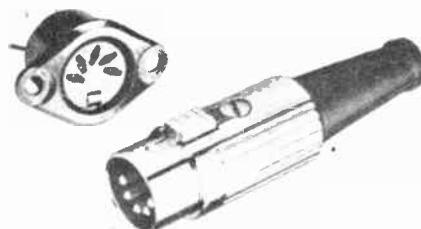
8-pin line socket offset

Order
FJ96E (DIN Line 8-Pin Offst) 48p

8-pin line socket circular

Order
FJ97F (DIN Line Skt 8-Pn Cr) 48p

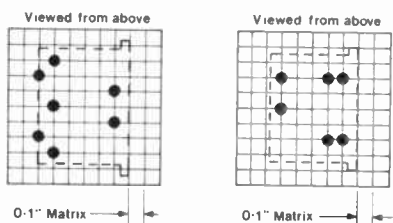
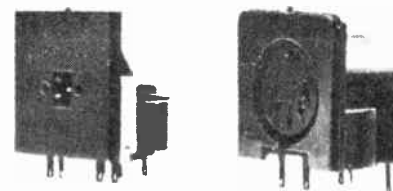
Latching Screened DIN Plug And Socket



A high quality DIN plug and socket with screened metal body and incorporating a latching mechanism. Plug has cable clamp and support sleeve. This plug and socket will mate with the appropriate part from any standard DIN range, but they will only latch when mated with each other. Plug and socket are 5-pin A (180°C).

Order
BW94C (Dinlatch 5-pin A Plg) £1.26
BW98G (Dinlatch Sckt 5-pin A) 65p

Printed Circuit Mounting DIN Sockets



DIN sockets for mounting directly on printed circuit boards. Rows of sockets are designed to fit flush up to one another. Dimensions: 21 x 21 x 16mm deep. Available in two types: 2-pin L/S and 5-Pin 'A' (180°).

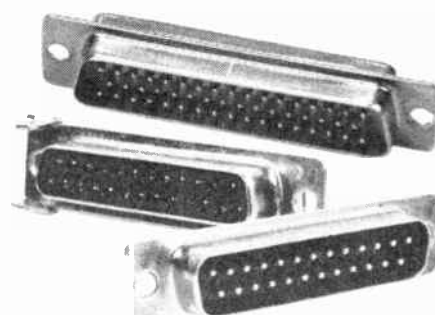
Order
YX90X (PC DIN Skt 2-pin) 28p
YX91Y (PC DIN Skt 5-pin A) 24p

SERIES D CONNECTORS

(See also IDC connectors)

A standard D series connector. Both plug or socket may be line or panel mounted. A thermoplastic cover is available which can be fitted to either the plug or socket or both and a novel locking system is available. The cover allows top or side-entry by removing the appropriate knock-out. A cable clamp is also provided.

Plug and Socket



Gold over nickel plated brass contacts identified on both sides of the moulding. Solder terminations.

Working current: 7.5A per contact.
Working voltage: 300V rms.
Contact resistance: <3mΩ
Insulation resistance: >10⁹MΩ

	9-Way	15-Way	25-Way
Overall length	31	39.4	53
Fixing Centres (M3/6BA)	25	33.3	47
Cut-out if mounting			
from rear of panel:	19 x 10	27 x 10	41 x 10
from front of panel:	21 x 12	29 x 12	43 x 12
Height	12.6	12.6	12.6
Width:	16	16	16

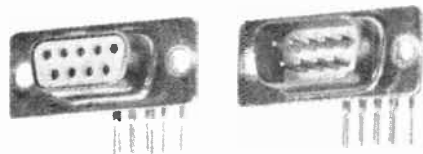
	37-Way	50-Way
Overall length	69	67
Fixing Centres (M3/6BA)	63.5	61.5
Cut-out if mounting		
from rear of panel:	58 x 10	55 x 13
from front of panel:	60 x 12	57 x 14
Height	12.6	15.5
Width:	16	16

All dimensions in mm.

Order

RK60Q (D-Range 9 Way Plug)	64p
BK58N (D-Range 15-Way Plug)	88p
YQ48C (D-Range 25-Way Plug)	£1.28
FV71N (D-Range 37-Way Plug)	£1.45
FV74R (D-Range 50-Way Plug)	£1.80
RK61R (D-Range 9 Way Skt)	95p
BK59P (D-Range 15-Way Skt)	£1.38
YQ49D (D-Range 25W Socket)	£1.98
FV72P (D-Range 37-Way Skt)	£2.45
FV75S (D-Range 50-Way Skt)	£3.20

Right-Angled D Connectors



A D series connector with right-angled bends in the pins, enabling them to be directly mounted onto PCB's. All dimensions are as standard series D connectors.

Order

FG25C (RA D-Range 9-Way Skt)	£1.70
FG26D (RA D-Range 15-Way Skt)	£2.45
FG27E (RA D-Range 25-Way Skt)	£3.45
FG66W (RA D Range 9 Way Plg)	£1.25
FG67X (RA D Range 15 Wy Plg)	£1.85
FG68Y (RA D Range 25 Wy Plg)	£2.70

Covers



A thermoplastic cover to fit both the plugs and the sockets described above. The connector is wired and the cover fitted afterwards. A removable side plate allows subsequent inspection without dismantling the assembly. The cable can enter from the side or top by removing the appropriate knock-out. Supplied with cable clamp & self tapping screws; the shorter one holds the side plate to the cover.

Order

RK62S (D-Range 9-Way Cover)	85p
BK60Q (D-Range 15-Way Cover)	95p
YQ50E (D-Range 25-Way Cover)	£1.20
FV73Q (D-Range 37-Way Cover)	£1.30
FV76H (D-Range 50-Way Cover)	£1.35

Latching Mechanism



A quick-lock, press-to-release latching system that holds the connector assembly tightly together whether both components are in-line or panel mounted or just one component is panel mounted. To assemble, place spring in slit in cover (see diagram) then mount connector in latching mechanism. Wire up the connector, then fit assembly to cover ensuring that spring is inside the side of the mechanism. On the mating connector simply slide the latches over the ends of the connector frame. Kit comprises spring, main bracket and two latches.

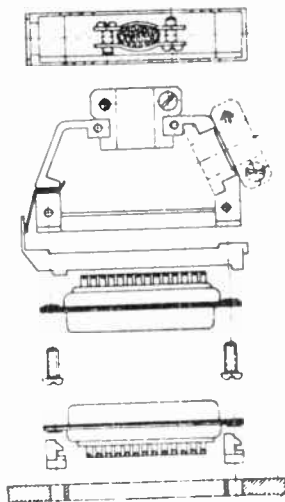
Order

RK63T (D Range 9 Way Latch)	48p
BK61R (D Range 15 Way Latch)	52p
YQ51F (D-Range 25-Way Latch)	58p
FV91Y (D-Range 37-Way Latch)	60p
FV92A (D-Range 50-Way Latch)	62p

Assembly Instructions

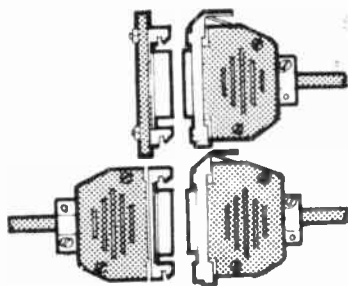
(1) Hooded connector plug

Open window in moulding to give appropriate cable entry. Place spring in slit in hood. Mount connector in lock mechanism, from mating side (i.e. away from release button). Secure connector/lock to hood using the larger self-tapping screws provided. Ensure that the spring is between the release button and the hood then fit the cable clamp. Secure the side plate to the hood with the remaining screw.

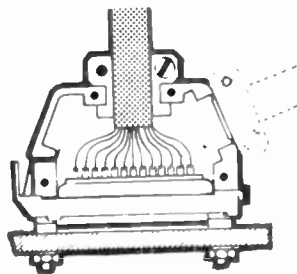


(2) Receptacle

The latches are mounted from the wiring side of the connector. Ensure that they are correctly orientated with respect to the mating plug. Where a hooded 'free' receptacle is required, assemble as in (1) above (without lock and spring), fitting latches between connector and hood.



Cable to cable or cable to panel.



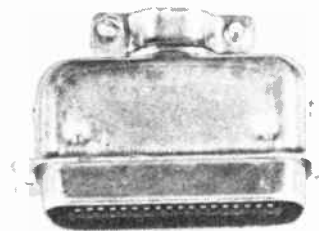
Fit hood after wiring — choice of cable entry.

IEEE-488 CONNECTORS CENTRONICS-TYPE

(See also IDC connectors)

A multi-way connection system commonly used for connecting data interface cables to computers and their peripherals. The gold-plated, double row, 36-way contacts connect to the cable conductors using the insulation displacement method. The plugs have ears for the spring clips of the socket to secure them in position.

Screened Plug

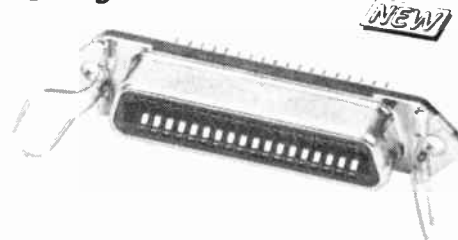


A 36-way double row plug in a metal body with oval cable entry and clamp. The body is in two parts secured by two screws, this being all that is required to retain the thermoplastic contact block. Overall width including ears: 62mm Overall width of pluggable part: 50mm Thickness: 17mm. Overall depth: 41mm.

Order

FJ61R (Centronix Type Con W)	£3.95
------------------------------	-------

Straight Chassis Socket



A 36-way double row socket with metal shroud. Connections are brought out at rear to two rows 0.15in. apart of 18 pins spaced at 0.1in. which may be directly inserted into a PCB. Alternatively, these may be hard wired. The socket can be mounted in a panel having a cut-out of 51 x 12mm, with fixing centres at 60mm x M3/6BA. Plug locking clips included.

Order

FV87U (Chass Centronics Skt)	£6.45
------------------------------	-------

Right-Angled Socket



A right-angled 36-way double row socket particularly suited to PCB mounting. The socket has two rows 0.15in. apart of 18 pins spaced at 0.1in. at 90° to the metal shrouded socket with its plug locking clips. The mounting base is 68 x 15mm, with fixing centres at 60mm x M3/6BA.

Order

FV88V (R/A Centronics Skt)	£7.45
----------------------------	-------

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PCB CONNECTORS



Connectors to enable pcb's to be plugged together horizontally or at right angles to one another. Contacts are gold-finished nickel-plated phosphor-bronze. Rated: 5A. Contact resistance: 6mΩ. Hole in pcb: 1.2mm dia. (5mm centres for twin tag types). Board thickness (max): 1.6mm. Three types are available.

45 degree type:	14.9 x 3.2mm (excl. pins)
Vertical type:	8.8mm (excl. pins)
Horizontal type:	15.2 x 4.3mm (excl. pins)

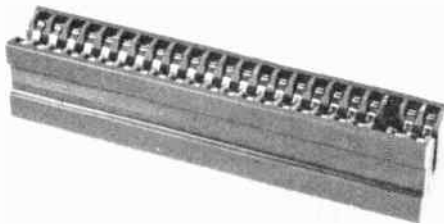
Order

WQ14Q (PCB Conns 45)	8p
WQ15R (PCB Conns Vertical)	8p
WQ16S (PCB Conns Horizontal)	8p

EDGE CONNECTORS

(See also IDC connectors)

0.1in Edge Connectors

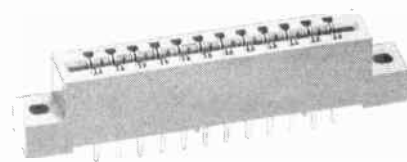


A series of edge connectors designed to mount directly on PCB's. Ideal for use with double-sided PCB's, and having their main uses in micro-computers. (e.g. ZX81, Spectrum, CBM64). The 28-way connector is blank at pin 5, and the 2 x 23-way at pin 3.

Order

BK97F (PC Edgconn 2x20 way)	£1.80
FG22Y (0.1in 2x22 PC Edgcon)	£1.95
RK35Q (PC Edgeconn 2x23-way)	£1.95
FG23A (0.1in 2x28 PC Edgcon)	£1.95

0.156in Edge Connectors

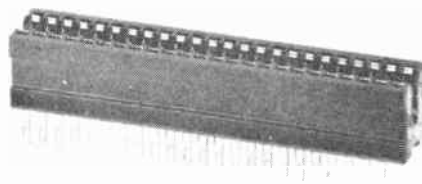


A series of edge connectors designed to mount directly on PCB's. Ideal for use with doublesided PCB's, and having their main use in microcomputers (e.g. VIC20, CBM64).

Order

FG24B (0.156in 2x6 PC Edgcn)	£1.60
BK74R (2x12 Way PC Edgecon)	£1.95
BK79L (0.156in 2x22way Egcn)	£2.95

Single-Sided Edge Connectors



A range of edge connectors identical in construction to the card frame type shown below. Although these connectors have two rows of contacts, only one row

is provided with solder tags for use with single-sided boards. The unused row provide a means of gripping the PCB as backing contacts. The connectors are open-ended so that wide PCB's may be inserted. Contacts have tags suitable for wiring or direct insertion in PCB's when a 1.4mm dia. hole is required. These connectors use the same mounting feet as does the card frame edge connector.

Specification

Current rating:	5A per contact
Working voltage:	350V AC peak or DC
Pcb thickness nominal:	1.6mm

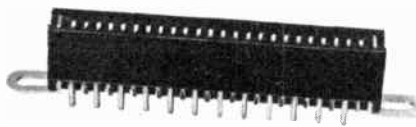
Type	Pitch	No. of contacts	Length (mm)	Width (mm)	Fix centres with mounting feet fitted
108	0.1in	8	21.5	10.5	34-38
116	0.1in	16	41.5	10.5	55-60
124	0.1in	24	61.0	10.5	75-80
132	0.1in	32	83.0	10.5	95-101

Moulding height:	12mm
Board insertion depth:	8.0mm
Tag length:	6.5mm

Order

FL83E (Edge Conn 108)	88p
FL84F (Edge Conn 116)	£1.28
FL85G (Edge Conn 124)	£1.48
FL86T (Edge Conn 132)	£1.98

Silver-Plated Type



24-way 0.1in. pitch silver-plated contacts. Intended for use with the DM02(T). Includes a polarising key fitted in position 5.

Order

FL30H (Edge Conn Silver)	£1.99
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Card Frame Type

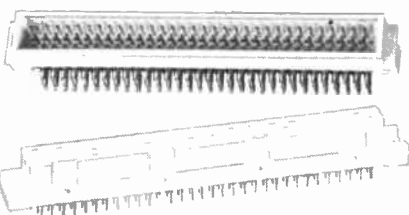


A 43-way solder lug edge connector primarily for use with the plug-in cards in a card frame. It is attached to the rear tie bar of the frame using end brackets. A polarising key is fitted at the seventh contact from the bottom to ensure the card is inserted correctly.

Order

YR57M (Card Frame Edge Conn)	£4.80
YR58N (Edge Conn End Bkt)	9p

DIN 41612 Indirect Edge Connectors



Good quality, compact connectors ideal, for example, for mounting a number of small pcb's onto a motherboard. The connectors comprise one multiway receptacle with pcb pins on a 0.1in pitch for vertical fixing to a motherboard, and a mating plug with right-angled pcb pins for horizontal fixing to a daughter board. Contacts are gold over nickel plated

phosphor bronze, rated at up to 50 insertions, for maximum reliability whilst at the same time rendering the boards quickly detachable. Both plug and receptacle have 6BA clearance fixing holes at each end so that they can be rigidly screwed to the pcb's. Connectors have a locating key to prevent accidental reversal on plugging in. Available in 32, 64 and 96 ways on one, two or three rows of pins.

Dimensions:	Plug	Receptacle
Length:	95.0mm	95.0mm
Width:	11.0mm	10.5mm
Fixing centres:	88.9mm	90mm
Depth + pins:	18mm	15.5mm
Without pins:	12.5mm	11.0mm

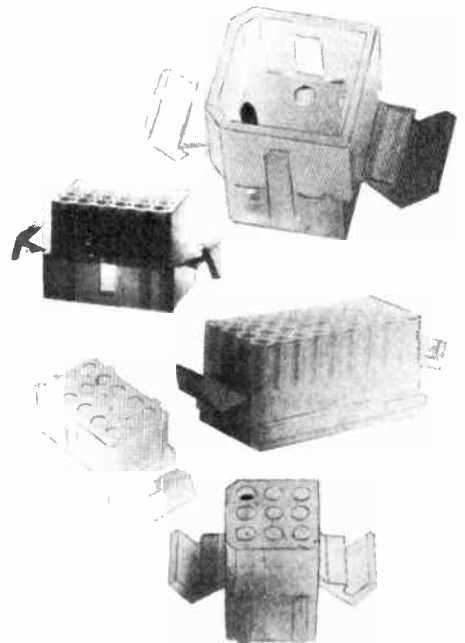
Distance between rows of pins: 64 ways, 0.2in
96 ways, 0.1 + 0.1in

Order

FJ45Y (PCB Rec Gold 32Way)	£1.20
FJ47B (PCB Rec Gold 64Way)	£2.95
FJ48C (PCB Rec Gold 96Way)	£3.95
FJ49D (PCB Plug Gold 32Way)	£1.60
FJ51F (PCB Plug Gold 64Way)	£1.95
FJ52G (PCB Plug Gold 96Way)	£2.45

MULTIWAY CONNECTORS

Multiway Plugs and Sockets



A range of very low cost multiway connectors. A plug housing and receptacle housing is available in each size and either type may be chassis mounted or cable mounted. The snap-in chassis mounting ears may be trimmed off if not required using a sharp craft knife. Plug and socket pins are available, which after soldering to the wire are easily inserted into the housings where they snap lock into position. Normally the plug pin would be used in the plug housing and the socket pin in the receptacle housing although the system works equally well if the opposite configuration is required. Housings need be equipped only with the number of plug and socket pins actually required for a particular application. Thus these connectors offer the option of any number of ways from 1 to 36 whilst still maintaining a very small overall size. All housings are polarised so that they can only be mated one way round and a friction lock between plug and receptacle is provided on all except 36-way. Also the holding action of the plug and socket pins stops the mated connector falling apart even under heavy vibration etc.

Rated 250V 5A per way. Contact resistance 5mΩ. Fixes to panels up to 16swg. Housings are available in 2, 4, 6, 9, 15, 24 and 36 ways.

Dimensions Of Plug Housings

Size	Overall dimensions	Panel cut-out
2-way	11x7.5x20mm	15.5x8mm
4-way	11x11x19mm	16x12mm
6-way	15x11.5x19mm	16x16mm
9-way	15x15x19mm	19x16mm
15-way	22.5x15x19mm	27x16mm
24-way	26.5x19x19mm	30x20mm
36-way	41x20.5x19mm	46x21mm

Dimensions of Receptacle Housings

Size	Overall dimensions	Panel cut-out
2-way	9x5x20.5mm	13x7mm
4-way	9x5x19mm	13x10mm
6-way	12.5x9x20mm	14x13mm
9-way	12.5x12.5x20mm	24x15mm
15-way	20x12.5x20mm	24x15mm
24-way	23.5x16x19mm	28x18mm
36-way	38x17.5x20mm	43x19mm

Order

YX33L	(Multicon Plug 2-way)	28p
YX34M	(Multicon Plug 4-way)	29p
FM45Y	(Multicon Plug 6-way)	30p
YX35Q	(Multicon Plug 9-way)	32p
YX36P	(Multicon Plug 15-way)	58p
YX37S	(Multicon Plug 24-way)	88p
YX38R	(Multicon Plug 36-way)	98p
YX39N	(Multicon Skt 2-way)	28p
YX40T	(Multicon Skt 4-way)	30p
FM46A	(Multicon Skt 6-Way)	38p
YX41U	(Multicon Skt 9-way)	48p
YX42V	(Multicon Skt 15-way)	78p
YX43W	(Multicon Skt 24-way)	98p
YX44X	(Multicon Skt 36-way)	£1.10
YX45Y	(Multicon Plug Pin)	3p
YX46A	(Multicon Skt Pin)	3p

Octal Plugs & Sockets

A range of plugs and sockets based on the international Octal valveholder and valve-base. Plug pins tinned brass; socket contacts tinned phosphor bronze, 1000V 5A max. per contact.

Chassis plug



8-way chassis mounting plug

Order

HL01B	(Octal Ch Plug)	95p
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Chassis socket



8-way chassis mounting socket.

Order

HL00A	(Octal Ch Skt)	65p
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Line plug

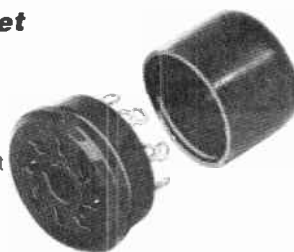


8-way line plug with black polythene cover.

Order

HL02C	(8-way Plug)	£1.60
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Line socket



8-way line socket with black polythene cover.

Order

HL03D	(8-way Socket)	£1.80
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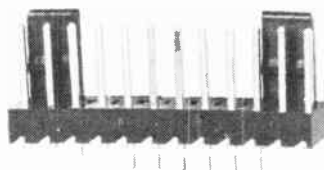
PRINTED CIRCUIT BOARD CONNECTORS

These connectors are intended as a simple and inexpensive method of making cable to printed circuit board connections. Available with pins on a 0.1in or 0.2in pitch.

0.1in Series (2.5mm)

A range of connectors for pcb mounting that allow circuit boards to be plugged together at right angles or end-to-end, or cables to be plugged onto circuit boards at right angles or end-on at the edge of the pcb. Both plugs and sockets may be butted up end-to-end to form connectors with any number of ways from 2 upwards. Rated: 2.5A, 250V AC.

Straight Polarized Locking Plug Assembly



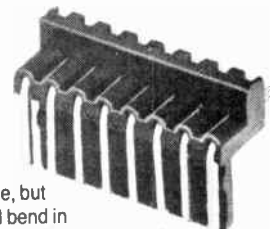
A wafer into which square, tinplated brass pins have been inserted. These pins protrude 3.4mm on one side, and these should be soldered flat to the PCB. The nylon wafer sits flat on the PCB and is 3.3mm thick, and the back wafer provides the locking and polarising. The plug pins are 7.5mm long. Wafers are 2.3mm wide, and the pins require a 1mm dia. PCB hole.

Type	Length (mm)	Type	Length (mm)
2-way	3.5	8-way	19.5
3-way	7.0	10-way	24.5
4-way	9.5	12-way	29.5
5-way	12.0	17-way	42.0
6-way	14.0	18-way	44.5

Order

RK65V	(Minicon Latch PI 2w)	18p
BX96E	(Minicon Latch PI 3w)	24p
YW11M	(Minicon Latch PI 4w)	28p
FY93B	(Minicon Latch PI 5w)	35p
YW12N	(Minicon Latch PI 6w)	38p
YW13P	(Minicon Latch PI 8w)	40p
RK66W	(Minicon Latch PI 10w)	48p
YW14Q	(Minicon Latch PI 12w)	60p
BH61R	(Minicon Latch PI 17w)	80p
BK85G	(Minicon Latch PI 18w)	85p

Right-Angled Polarized Locking Plug Assembly



Wafer connectors similar to the above, but with a right-angled bend in them, enabling one PCB to be connected parallel to another, or a right-angle PCB to cable connection. All dimensions are as Straight Polarized Locking Plug Assembly.

Order

FY92A	(RA Lch Minlcn PI 2w)	35p
YW15R	(RA Lch Minlcn PI 3w)	38p
FY91Y	(RA Lch Minlcn PI 4w)	42p
RK67X	(RA Lch Minlcn PI 5w)	48p
FB99H	(RA Lch Minlcn PI 6w)	58p
YW18U	(RA Lch Minlcn PI 8w)	64p
RK68Y	(RA Lch Minlcn PI 10w)	68p
YW19V	(RA Lch Minlcn PI 12w)	78p
FT67X	(RA Lch Minlcn PI 17w)	95p
BK84F	(RA Lch Minlcn PI 18w)	98p

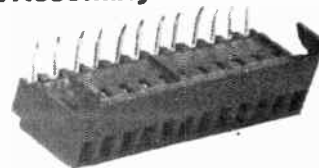
Socket Housing

A housing which accepts the Minicon terminals and then plugs onto the wafer plug assembly. Solder the wire to the terminal, then push the terminal into the housing until it latches and cannot be withdrawn. Housings are 13.5mm high and 4.8mm thick

Order

HB59P	(Mncn Ltch Hsg 2way)	8p
BX97F	(Mncn Ltch Hsg 3-way)	9p
HB58N	(Mncn Ltch Hsg 4way)	10p
BH66W	(Mncn Ltch Hsg 5-way)	12p
BH65V	(Mncn Ltch Hsg 6-way)	15p
YW23A	(Mncn Ltch Hsg 8-way)	18p
FY94C	(Mncn Ltch Hsg 10way)	20p
YW24B	(Mncn Ltch Hsg 12way)	24p
RK69A	(Mncn Ltch Hsg 17way)	35p

Right-Angled Socket Assembly



Housings with printed circuit type tin-plated brass terminals preassembled with pins at right-angles to the housings for direct pcb mounting. Thus boards with straight plugs may be connected at right-angles and boards with right-angle plugs may be connected end to end. Housing is 7.9mm wide 4.7mm high. The housing has a clip which holds it against the edge of the pcb. Pin length: 3.3mm x 1mm dia. holes, which should be drilled 5.3mm from edge of pcb.

Type	Length (mm)	Type	Length (mm)
3-way	7.52	8-way	19.53
4-way	10.06	12-way	30.38
6-way	15.4		

Order

YW26D	(Minicon Skt 3-way)	28p
YW27E	(Minicon Skt 4-way)	40p
YW28F	(Minicon Skt 6-way)	48p
YW29G	(Minicon Skt 8-way)	58p
YW30H	(Minicon Skt 12-way)	78p



FAST SERVICE LOWEST PRICES

★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

Polarising Key

A polarising key which fits into a position in the Socket Housing in place of a terminal. The corresponding pin on the plug should be cut off and the socket will then only plug in if it is the correct way round.

Order

YW31J (Polarcon 0.1in) 6p

Minicon Terminal

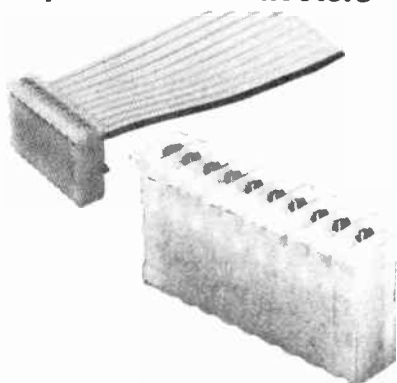


Tin-plated brass terminals for use with the Socket Housings. Designed for solder or crimp connection.

Order

YW25C (Minicon Terminal) 3p

0.1in. Insulation Displacement Connectors



A nylon housing with pre-assembled tin-plated brass terminals, offering an extremely fast and simple method of connecting cables to PCBs. For the special cable required, see Cables Section. The cable is simply pressed into the connector using the special tool described below. No wire stripping at all is required. The wires are forced into an insulation piercing slot that pushes the insulation aside and makes a good solid contact with the conductor. Housings are 14mm wide and 8mm thick.

Order

YW95D (IDC Con 3-way) 34p
YW96E (IDC Con 4-way) 48p
YW97F (IDC Con 6-way) 58p
YW98G (IDC Con 8-way) 88p
YW99H (IDC Con 12-way) £1.40

Insulation Displacement Cable Insertion Tool



A white plastic tool for pressing the special cable into insulation displacement connectors.

Order

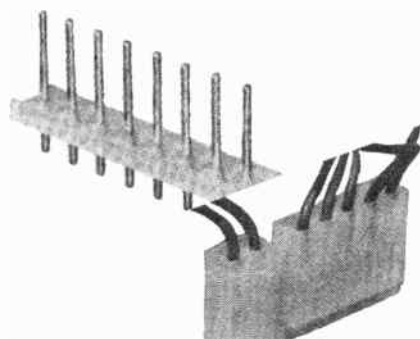
YX49D (IDC Insertion Tool) £2.95

0.2in Series

A range of connectors for pcb mounting allowing cables to be plugged directly onto pcb's. Plugs and sockets may be butted end-to-end to form connectors with any number of ways from 3 upwards. Rated:4A at 250V AC. Available in 3, 4, 6, 8 and 12 ways.

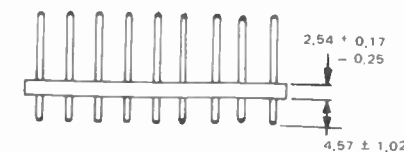
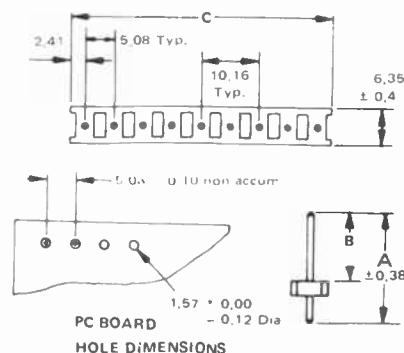
Plug Assembly

A nylon wafer into which round, tin-plated brass terminals have been inserted. The pins protrude



4.75mm on one side and these should be soldered to the pcb. The nylon wafer sits flat on the pcb and is 2.54mm thick. The plug pins are 11.94mm long. Wafers are 6.35mm wide and the pins require 1.57mm diameter holes in the pcb.

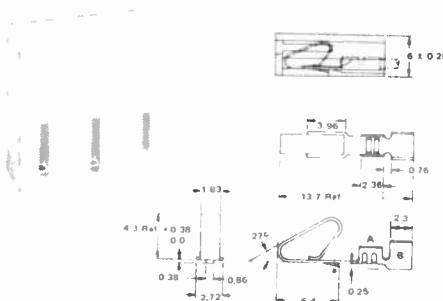
Type	Length (mm)	Type	Length (mm)
3-way	14.99	8-way	40.39
4-way	20.07	12-way	60.71
6-way	30.23		



Order

HL04E (Wafercon Plug 3-pin) 15p
HL05F (Wafercon Plug 4-pin) 18p
HL06G (Wafercon Plug 6-pin) 24p
HL07H (Wafercon Plug 8-pin) 28p
HL08J (Wafercon Plug 12-pin) 38p

Socket Housing



A nylon housing which accepts the Wafercon Terminals and then plugs onto the wafer plug assemblies. Solder the wire to the terminal then push the terminal into the housing until it latches and cannot be withdrawn. Housings are 15.9mm high and 6mm thick.

Order

HL09K (Wafercon Skt 3-way) 15p
HL10L (Wafercon Skt 4-way) 18p
HL11M (Wafercon Skt 6-way) 19p
HL12N (Wafercon Skt 8-way) 20p
HL13P (Wafercon Skt 12-way) 32p

Wafercon Terminal



Tin-plated brass terminals for use with the socket housings. Designed for solder or crimp connection.

Order

HL14Q (Wafercon Terminal) 3p

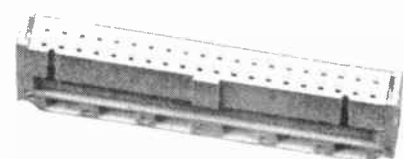
Polarising Key

A polarising peg which fits into a position in the Socket Housing instead of a terminal, the corresponding pin on the plug should then be cut off and the socket will then only plug in if it is the correct way round.

Order

YW32K (Polarcon 0.2in) 9p

BS9525 0.05in INSULATION DISPLACEMENT CONNECTORS (IDC) Double Row Cable Connectors

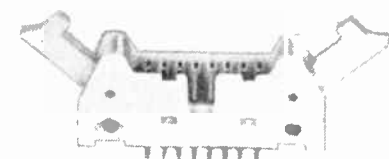


A series of double row IDC connectors mainly used with microcomputers and conforming to BS9525.

Order

FG44X (2x8 diI IDC socket) £1.10
FG84F (2x10 diI IDC Socket) £1.20
FG85G (2x13 diI IDC Socket) £1.60
FG86T (2x17 diI IDC Socket) £1.95
FG87U (2x20 diI IDC Socket) £2.50
FA40T (2x25 diI IDC Socket) £2.50

IDC PCB Header Plugs



A range of PCB mounting header plugs matching the double row cable connectors, conforming to BS9525.

Order

FJ13P (16way IDC Header) £1.40
FJ14Q (20way IDC Header) £1.50
FJ15R (26way IDC Header) £1.65
FJ16S (34way IDC Header) £1.95
FJ17T (40way IDC Header) £2.60
FA41U (50way IDC Header) £2.88

CALL IN TO YOUR LOCAL
Maplin SHOP
in SOUTHEND
 282 London Rd., Westcliff. ☎0702 554000

Right Angled IDC PCB Header Plugs

NEW



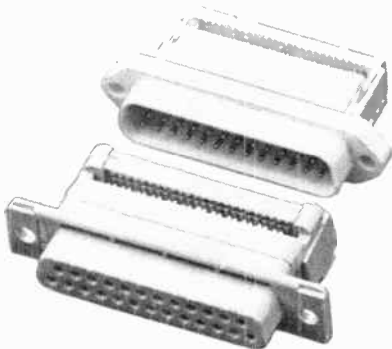
PCB mounting IDC header plugs for use with the double row IDC cable connectors, having right angled PCB pins.

Order

FA42V	(16way IDC Header R/A)	£1.10
FT72P	(20way IDC Header R/A)	£1.25
FA43W	(26way IDC Header R/A)	£1.50
FA44X	(34way IDC Header R/A)	£1.95
FA45Y	(40way IDC Header R/A)	£2.20
FA46A	(50way IDC Header R/A)	£2.65

Flat Cable IDC Series D Connectors

NEW

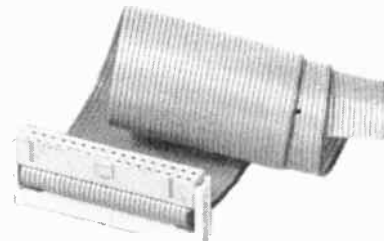


Of the range of the D series plugs and sockets described elsewhere in this section, 9-way, 15-way and 25-way plugs and sockets are now available in IDC form, greatly simplifying the task of terminating many wires. In addition, many plugs or sockets can share the same cable harness for looping to several destinations. These plastic bodied connectors will mate with the other D range connectors shown elsewhere in this section.

Order

FV77J	(IDC D-Rng 9-Way Plg)	£2.80
FV79L	(IDC D-Rng 15-Way Plg)	£2.98
FV81C	(IDC D-Rng 25-Way Plg)	£3.75
FV78K	(IDC D-Rng 9-Way Skt)	£2.80
FV80B	(IDC D-Rng 15-Way Skt)	£2.98
FV82D	(IDC D-Rng 25-Way Skt)	£3.75

IDC Connectors With Cables Fitted



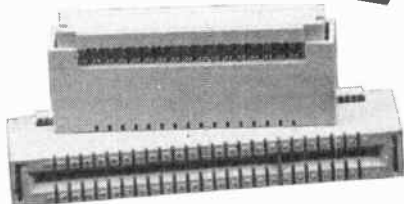
A range of assembled Flat Cables and IDC Connectors conforming to BS9525 with pins on 0.05in spacing. All connectors are moulded in thermoplastic, glass-fibre filled resin. Max working voltage: 750V DC. Max working current: 2A. Fitted with ¼ metre (10in approx) of cable and other end unterminated. Available in 16 way, 20 way, 26 way, 34 way and 40 way.

Order

FJ01B	(16 Way IDC Skt + Cable)	£2.35
FJ02C	(20 Way IDC Skt + Cable)	£2.40
FJ03D	(26 Way IDC Skt + Cable)	£2.85
BK96E	(34 Wy IDC Skt + Cble)	£3.80
FJ04E	(40 Way IDC Skt + Cable)	£3.95

IDC Edge Connectors

NEW



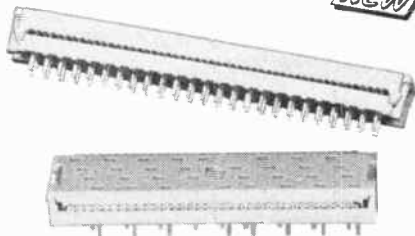
These grey moulded edge connectors feature closed ends for precise mating with a tongue shaped card edge, thus completely obviating any mismatch due to sideways slip. Another specialised feature of these connectors is the use of a polarising key which, if required, can be fitted between any pair of contacts thereby preserving full use of the maximum number of ways. These connectors can be supplied in 16-way, 20-way, 26-way, 34-way, 40-way and 50-way. Polarising keys are available separately.

Order

FT36T	(16W IDC Edge Connctr)	£1.80
FT37U	(20W IDC Edge Connctr)	£2.40
FT38V	(26W IDC Edge Connctr)	£2.85
FT39W	(34W IDC Edge Connctr)	£3.45
FT90X	(40W IDC Edge Connctr)	£3.95
FT60Q	(50W IDC Edge Connctr)	£4.95
QY73Q	(Polarising Key IDC)	5p

PCB Transition Headers

NEW



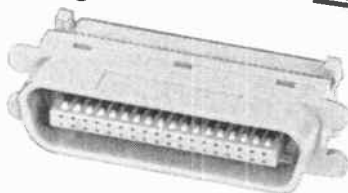
Two alternative types of transition headers for permanently attaching IDC cable looms to a pcb. One type has two straight rows of pins (Str) and the other has staggered rows of pins (Stg).

Order

FA47B	(Str Transheader 16w)	£1.30
FA48C	(Str Transheader 20w)	£1.38
FA49D	(Str Transheader 26w)	£1.48
FA50E	(Str Transheader 34w)	£1.68
F51F	(Str Transheader 40w)	£1.84
F52G	(Str Transheader 50w)	£1.98
FV83E	(Stg Transheader 16w)	£1.55
FV84F	(Stg Transheader 20w)	£1.60
FV85G	(Stg Transheader 26w)	£2.10
FV86T	(Stg Transheader 34w)	£2.45
FA53H	(Stg Transheader 40w)	£2.60
FA54J	(Stg Transheader 50w)	£2.98

Flat Cable Centronics Type IDC Plug

NEW



A 36-way double row plug in a thermoplastic body and cable clamp for use with IDC or flat cable up to 36-way. Dimensions: Overall width including ears, 62mm.

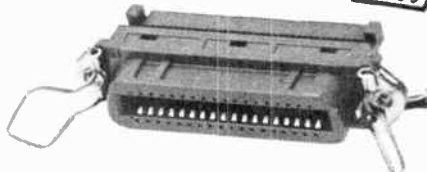
Overall width of pluggable portion, 50mm
Overall depth, 22mm

Order

FJ62S	(Centronix Type Con R)	£5.95
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Flat Cable Centronics Type IDC Chassis Socket

NEW



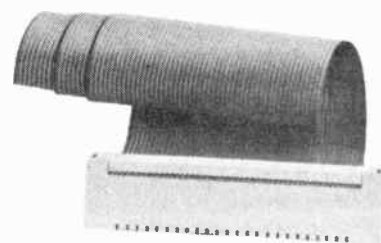
A 36-way double row socket is a thermoplastic body with cable clamp, for use with up to 36-way flat IDC cable. This chassis socket has fixing centres at 60mm x M3/6BA, and requires a cut-out for fitting from front of panel only of 52 x 15.5mm. Includes spring clips for locking the plug.

Order

FT74R	(IDC Centronics Skt)	£5.95
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IDC Edge Connector and Cable Assemblies

NEW



The IDC Edge Connectors as above connected to 1m of IDC cable. The other end of the cable is unterminated.

Order

FT71N	(2X17W IDC Edge + Cable)	£5.95
FT70M	(2X25W IDC Edge + Cable)	£7.95

PRINTED CIRCUIT TERMINAL BLOCKS



These PC terminal blocks are the ideal way of connecting conventional wiring to printed circuit boards. Compact, inexpensive and robust, they mount at 5mm centres. The screws are steel M2.6 x 5mm.

Order

FT38R	(2-Way PC Terminal)	24p
RK72P	(3 way PC Terminal)	37p
RK73Q	(4 way PC Terminal)	39p
RK38R	(8-Way PC Terminal)	64p
RK74R	(12 way PC Terminal)	98p

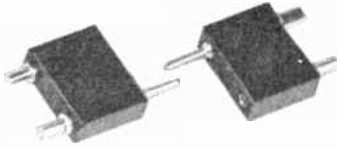
LET US MAKE IDC LEADS TO YOUR SPECIFICATION

Choose from any of the above IDC connectors and IDC cables on page 76 and we'll make the lead for you to precisely the length you require. Full details in the Miscellaneous Section at the end of this Catalogue.

MODEL CONTROL CONNECTORS

A range of lightweight, compact plug and socket arrays especially suitable for model control applications where small physical size and minimum weight may be essential, in the case of model aircraft, for example. Reliability is assured by the contact surfaces being gold plated, for both plug and socket.

Battery Connector

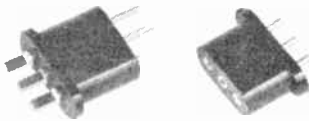


A non-reversible, mirror image plug and socket assembly for quick and simple battery coupling.

Order

FK96E (Batt Pl/Skt Pair) 68p

3-Pin Connector

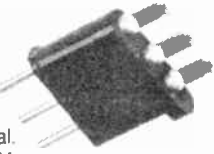


A 3-pin plug and socket assembly for inter-connections where three wires are required. Note the connectors are not polarised.

Order

FK97F (GP Pl/Skt Pair) 58p

3-Way Polarised Plug



A 3-pin plug having one pin offset in order to prevent accidental reversal. Such connectors are ideal for interconnecting the receiver to a servo control circuit, providing power on two pins and a signal on the other.

Order

FK99H (3-Pin Offst Plug) 28p

3-Way Polarised Socket

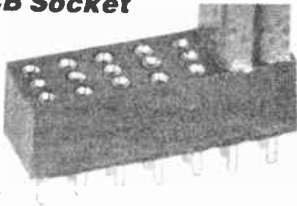


A non-reversible 3-pin socket that mates to the above plug.

Order

FK98G (3P Offst Skt S3M) 30p

7-Way PCB Socket



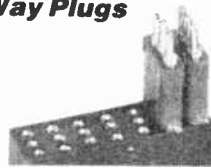
A PCB mounting socket providing for up to seven 3-way outlets from receiver board etc. Pins are spaced 2mm apart in each row of 3 pins, with 3mm spacing between rows. Overall length of block: 22mm. Overall width: 7mm.

Note these connectors are nonpolarised.

Order

FM01B (BL21R 7-Way Skt Bloc) £1.98

Small 3-Way Plugs



Miniature 3-pin plugs to fit the above 7-way socket block. Plugs are sold singly.

Order

FM00A (P3R 3-Pin Plug) 28p

PLUGS FOR LARGE PATCHBOARD



Silver-plated plugs for use with the Large Patchboard. Pin is 21mm long. White plastic body is 17mm long.

Order

WQ10L (Large Patch Plug) 38p

POWER CONNECTORS

Car Accessory Plug



A plug for cigarette lighter sockets to which car accessories may be connected.

Order

HW12N (Car Accessory Plug) 38p

Cigarette Lighter Extension Lead



An extension lead with plug at one end to fit the cigarette lighter socket in a car and socket at the other end to accept cigarette lighter plug. Approx. 1.7m of lead.

Order

YB68Y (Car Lighter Ext Lead) £2.95

Cigarette Lighter Power Lead

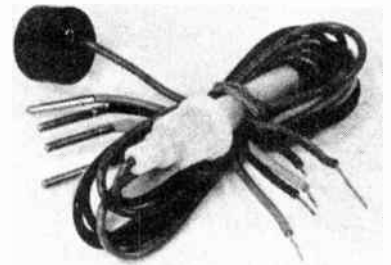


A cigarette lighter plug connected to 1.8m of lead and terminating in a 2-pin socket marked + and -. Any one of four plugs supplied may be connected to the socket and the plugs are marked tip and barrel. Plugs supplied are 2.5mm and 3.5mm jacks and 2.1mm and 2.5mm power plugs.

Order

YW59P (Car Power Lead) £2.95

Low-Power Connection Cord

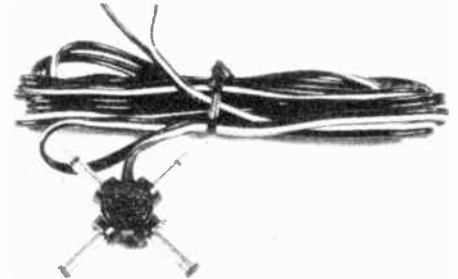


A plastic moulding to accept the pins fitted to five leads colour coded red, grey, orange, green and black. The red has an in-line fuse-holder fitted with a 1½in. 3A fuse connected to the lead. Leads are 300mm long except red which is 300mm long on each side of the fuse-holder. The pins may be inserted in the moulding in dozens of different combinations of positions (since moulding has 10 holes in it) to suit the socket on the equipment to be powered.

Order

HH39N (Multi-position Plug) 80p

Universal Plug



A four-way plug: 2.1 power; 2.5 power; 2.5mm jack; 3.5mm jack; moulded onto 2m of 2-core flex.

Order

HH38R (Universal Plug) £1.60

CASSETTE POWER PLUGS AND SOCKETS

1.3mm Plug

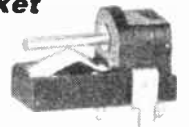


A miniature DC power plug as used with the Walkman-type personal stereo cassette players. Suitable only for use with matching socket having 1.3mm dia. pin.

Order

FK05F (Mini DC Pwr Plug) 24p

1.3mm PCB Socket



A PCB mounting socket compatible with 1.3mm Walkman type plugs.

Order

FK07H (PCB Mini DC Pwr Skt) 28p

Standard 2.1mm Plug



2.1mm power plug of standard length.

Order

HH60Q (Std Power Plug 2.1) 22p



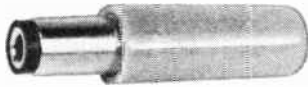
Long 2.1mm Plug



2.1mm power plug having a long reach.

Order
HH61R (Long Pwr Plug 2.1)..... 24p

Standard 2.5mm Plug



2.5mm power plug of standard length.

Order
HH62S (Std Power Plug 2.5)..... 22p

Long 2.5mm Plug



2.5mm power plug having a long reach.

Order
HH63T (Long Pwr Plug 2.5)..... 24p

JVC-Type 3.1mm Plug



JVC-type 3.1mm plug with cable strain relief

Order
FM47B (JVC Type DC Plug)..... 28p

2.1mm Socket



2.1mm chassis socket with break contact suits Std Power Plug 2.1.

Order
HH85G (Power Skt 2.1)..... 28p

2.5mm Socket



2.5mm chassis socket with break contact suits Std Power Plug 2.5.

Order
HH86T (Power Skt 2.5)..... 28p

2.1mm Plastic Socket



A plastic bodied 2.1mm power socket with break contact. Suits STD power plug 2.1.

Order
FT96E (Plas 2.1 Chas Skt)..... 20p

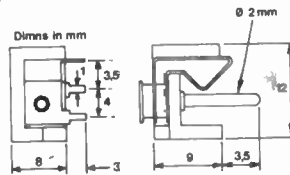
Plastic 2.5mm Socket



A plastic bodied 2.5mm chassis socket with break contact. Suits STD power plug 2.5.

Order
FT97F (Plas 2.5 Chas Skt)..... 20p

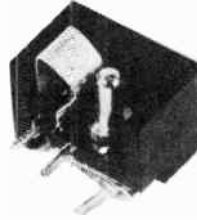
2.1mm Socket Printed Circuit Mounting



A DC socket that mounts directly onto PCB's. Eliminates internal wiring. Intended for low voltage and current applications. Should not be used at currents greater than 2A or DC voltages greater than 50V. Ideal for most 12V DC powered items.

Order
RK37S (PC Mtg Power Socket)..... 28p

2.5mm Socket Printed Circuit Mounting



A 2.5mm PCB mounting DC power socket with break contact.

Order
FK06G (PCB 2.5mm DC Pwr Skt)..... 28p



2.1mm to 1.3mm Adaptor



Converts 2.1mm power plug to 1.3mm for use with Walkman type cassette player power sockets.

Order
FK08J (DC 2.1 - 1.3mm Adapt)..... 34p

2.5mm to 1.3mm Adaptor



Converts 2.5mm power plugs to 1.3mm for use with Walkman type cassette player power sockets.

Order
FK09K (DC 2.5 - 1.3mm Adapt)..... 34p

3.5mm Jack to 1.3mm DC Adaptor



An adaptor which enables a mono 3.5mm jack plug to supply Walkman type cassette players using 1.3mm DC power sockets.

Order
FK10L (DC 3.5 - 1.3mm Adapt)..... 44p

CASSETTE MAINS CONNECTORS

Paros Type Socket



A cassette two-pin mains socket with changeover switch for disconnecting internal battery etc. when plug is inserted. Suits Paros plug. Fixing centres: 6BA clear holes 30mm apart. Panel cutout required: 18.5 x 13mm.

Order
HH88V (Cassette Skt Paros)..... 44p

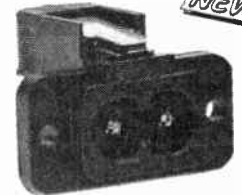
Paros Type Plug



A 2-pin plug for use with the paros style mains socket. Twin wire cable can be terminated to a pair of solder tags beneath the removeable cover retained by a single screw. Overall length 30mm.

Order
FV00A (Paros Plug)..... 18p

Telefunken Type Socket



A 2-pin mains socket with integral change over switch for isolating internal battery supply or similar, operated on insertion of the plug. Suits Telefunken plug. Cut-out required: 20 x 20mm. Fixing centres: 26.5mm.

Order
FT98G (Telefunken Skt)..... 45p

Telefunken Type Plug



A 2-pin line plug for use with the telefunken style 2-pin mains socket. Twin wire cable can be terminated to the pair of solder tags inside, beneath the removeable cover retained by a single screw. Overall length 31mm.

Order
FT99H (Telefunken Plug)..... 18p

PHONE NOW
0702 552911



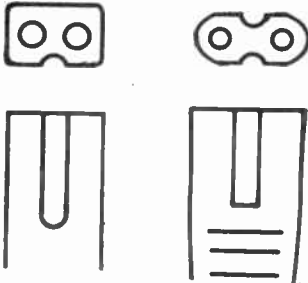
Access, Visa, American Express, Mapcard.
 Phone before 2pm for same day despatch.

Cassette Mains Leads



A pair of mains leads with moulded plugs which fit the mains sockets on many battery/ mains cassette players, radios etc. The drawings are full size.

Paros Telefunken



Order

RW61R (Cas Lead Paros)	65p
RW66W (Cas Lead Telefunken)	64p

AMERICAN MAINS CONNECTORS Plug

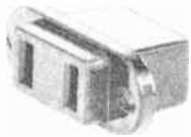


A two pin 7.5A line plug with flat pins on 12.7mm centres. For 110V use only.

Order

HL17T (USA Mains Plug)	38p
------------------------	-----

Chassis Socket

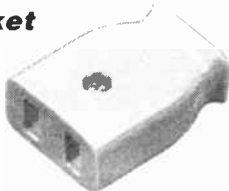


A two pin 7.5A chassis socket to suit USA Mains Plug. Fixing centres 27mm. For 110V use only.

Order

HL18U (Flat Pin M/S)	28p
----------------------	-----

Line Socket



A two pin 7.5A line socket to suit our USA Mains Plug. For 110V use only.

Order

HL19V (Flat Pin Conn)	38p
-----------------------	-----

PHONE NOW
0702 552911



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

EUROPEAN STYLE MAINS CONNECTORS

Line Socket



Rated at 6A at 250V AC, this socket includes cord grip and strain relief sleeve.

Order

HL16S (Eurosocket)	90p
--------------------	-----

Right Angle Mains Inlet Line Socket

NEW

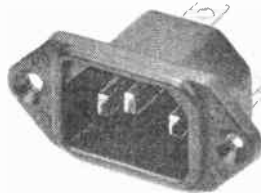
This well finished right angled or side entry line socket is rated at 6A at 250V AC. It features clearly labelled screw terminals for connecting wires to Live, Neutral and Earth. In addition there is a metal cable clamp, and a strain relief sleeve.



Order

FT62S (R/A Euro Mns In P588)	£1.95
------------------------------	-------

Mains Inlet Chassis Plug



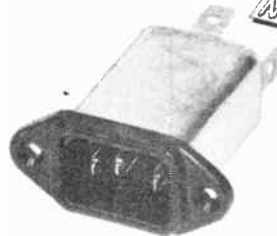
Mounting hole: 27 x 20mm Fixing centres: 40 x 6BA (M3) countersunk. Overall depth: 33mm

Order

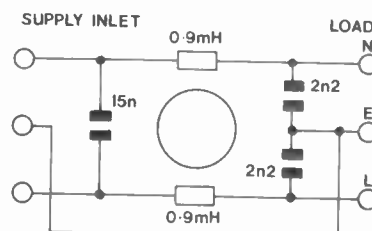
HL15R (Europlug)	68p
------------------	-----

Filtered Mains Inlet Chassis Plug

NEW



A chassis mounting Euro style mains input connector which incorporates an integral interference filter for the exclusion of unwanted noise from the mains supply, or to prevent equipment introducing noise spikes into the mains circuit. The combined inductive and capacitive filter, contained in a metal case, includes the Earth connection in its arrangement together with the Live and Neutral to cover all possible interference sources.



It only needs the addition of a mains transient suppressor to provide all round filtering of mains bourne noise. Ideal for sensitive audio equipment, computers or, retrospectively, for appliances having for example brush and commutator type 240V electric motors (electric drills etc). Connecting wires are terminated to solder tags. Approved to BS613.

Specifications:

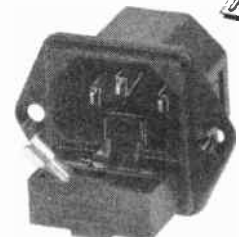
Nominal wkg voltage:	250V AC @ 50Hz
Current rating:	6A
Earth leakage current:	0.35mA
Dimensions:	Width 50mm. Depth 22mm. Length 60mm.
Cutout required:	28 x 21mm.
Fixing centres:	40mm.

Order

FT36P (Mains In Filter Plg)	£7.95
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Fused Mains Inlet Chassis Plug

NEW



A chassis mounting Euro style mains inlet connector with a built in fuseholder that accepts a 5 x 20mm cartridge fuse. The fuse is connected in the Live line only. The fuseholder consists of a small 'drawer' which cannot be withdrawn unless the input lead line socket is removed first. The fuse is automatically disconnected and remains loose in the 'drawer,' changing the fuse is merely a matter of lifting out the old and dropping in the new. Additional space is provided at the front of the 'drawer' to carry a spare fuse. (Fuses are not included). The line socket cannot be inserted without closing the 'drawer'.

Order

FT37S (Fused Euro Ch Plg)	98p
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Mains Outlet Chassis Socket

NEW



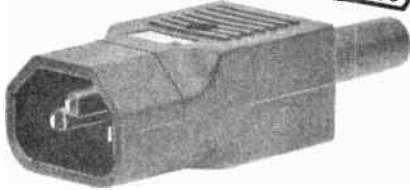
A mains outlet chassis socket complementary to the mains inlet chassis plug HL15R. Physically identical it requires a 32 x 25mm mounting hole, and has an overall depth of 35mm. Fixing centres are 40mm x 6BA or M3, countersunk. Contacts are rated at 6A at 250V AC, with solder tag terminations at rear 2.5mm wide x 10mm long.

Order

FT63T (Euro Outlt Skt P675)	75p
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CALL IN TO YOUR LOCAL
Maplin SHOP
in MANCHESTER
8 Oxford Road. ☎061 236 0281

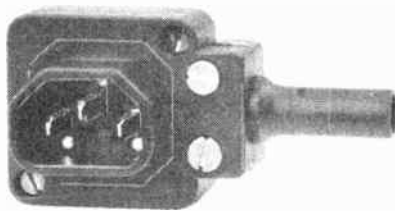
Mains Outlet Line Plug NEW



A line plug for use with the chassis mounting Euro outlet socket. The line plug has shielded pins to prevent accidental touching of the pins whilst inserting or removing the plug. Wires are terminated to the connectors using screw terminals. Includes cable clamp and strain relief sleeve. Rated at 6A at 250V AC.

Order
FT64U (Euro Outlt Plg P686) £1.85

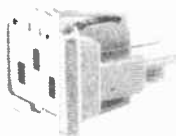
Right Angle Mains Outlet Line Plug NEW



A right angled or side entry Euro style mains outlet plug, having the special feature that the centre portion comprising the shielded pins and screw terminals can be mounted into the body upon assembly in any one of four positions relative to the body and 90° to each other, so that the cable may exit in whichever direction is the most convenient. Includes cable clamp and strain relief sleeve. Rated at 6A at 250V AC.

Order
FT65V (Euro R/A Out Pg P685) £1.95

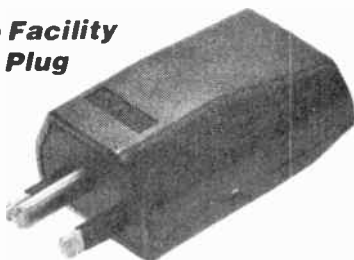
Euro Facility Chassis Socket



Mounting hole: 28.24 x 23.24mm. Overall depth: 33mm. Socket is snap-in fixing. Sockets are shuttered.

Order
HL42V (Euro Facility Outlet) 90p

Euro Facility Line Plug



Plug has cord grip and strain relief grommet. The pins are partly shrouded for extra safety.

Order
HL43W (Euro Facility Plug) £1.95

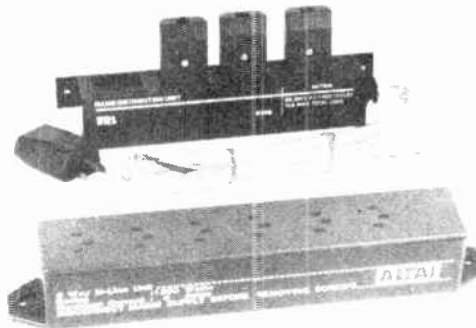
Moulded Plug Lead and Chassis Socket STAR BUY



A three pin chassis plug and line socket permanently moulded to 1.5m of 3-core flex. Rated at 6A. Not available separately.

Order
BW99H (Euroconn Lead) £2.40

Hi-Fi Distribution Boxes



Designed to be mounted behind hi-fi equipment etc. these neat compact boxes have 4 or 6 Eurosockets mounted in line. There is 1m of 6A mains lead fitted. Sockets are shuttered. 4 way type comes complete with four Euro-facility plugs supplied, the six way does not. Rated 1.5kW total. Max current 6A.

Overall size:	4-way	204 x 36 x 34mm
	6-way	236 x 38 x 39mm
Fixing centres:	4-way	190 x 3mm clear
	6-way	220 x 3mm clear

Order
WY16S (Euroboard 4-way) £9.95
WY17T (Euroboard 6-way) £6.95

3-PIN LOW CURRENT RANGE

P429

A three pin chassis plug. Overall depth: 21mm. Mounting hole: 19mm dia. Bezel diameter: 24.7mm. Rated: 1.5A at 250V, 2A at 110V, 3A at 6V AC and DC. Mates with sockets P646 and P430SE.



Order
HL20W (Mains Plug P429) 78p

P646

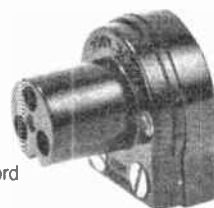
A 3-pin line socket to fit plug P429. With cord grip and strain relief sleeve. Rated: (as P429).



Order
HL44X (Mains Socket P646) £1.80

P430SE

A 3-pin line socket; side entry version of P646. With cord grip. Rated: (as P429).



Order
HL23A (Mains Socket P430SE) £1.60

P649



A 3-pin plug with cord grip and strain relief sleeve. Rated at 2.5A at 250V, 3A at 110V, 4A at 6V AC and DC. Mates with socket P650.

Order
HL45Y (Mains Plug P649) £1.60

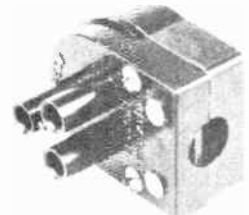
P650



A 3-pin chassis socket. Mounting hole: 19mm. Rated: (as P649). Mates with plug P649.

Order
HL46A (Mains Socket P650) £1.20

SA2403



A 3-pin line plug with shielded pins and cord grip. Plug is side entry type. Rated: 2A at 250V, 3A at 110V and 4A at 6V AC and DC. Mates with socket SA2404.

Order
HL47B (Mains Plug SA2403) £1.80

SA2404



A 3-pin chassis socket. Mounting hole: 19mm dia. Rated (as SA2403). Mates with plug SA2403.

Order
HL48C (Mains Socket SA2404) 95p

3-PIN 5A RANGE

Please note that these connectors are not suitable for use on domestic equipment at voltages over 50V. However SA1861 can be used at 250V AC provided access is impossible whilst connected to the mains according to the Electrical Equipment (Safety) Regulations, 1975.

SA1861

A 3-pin chassis plug. Overall depth: 33mm. Mounting hole: 27mm dia. Bezel dia. 40mm. Fixing centres: 32mm x 4BA. Rated: 5A at 50V AC (otherwise as above). 7A at 6V AC and DC. Mates with sockets SA2597 and SA2111.



Order
HL27E (50V Plug SA1861) 85p



0702 552911

SA2597

A 3-pin line socket to fit plug SA1861. With cord grip. Strain relief sleeve available separately, if required. Rated 5A at 50V max.

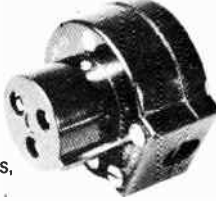


Order

HL28F (50V Socket SA2597) 98p

SA2111

A 3-pin line socket; side entry version of SA2597. With cord grip. Fits plug SA1861, and the pair are suitable for use at 250V AC in domestic applications, otherwise rated as SA1861.

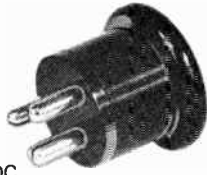


Order

HL49D (250V Socket SA2111) £2.45

SA2019A

A 3-pin line plug with cord grip. Strain relief sleeve available separately if required. Rated: 250V at 5A AC (see note above), 110V at 5A AC (see note above), 6V at 6A AC, 1A DC. Mates with socket SA2020.

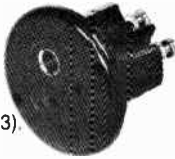


Order

HL30H (Mains Plug SA2019A) £1.80

SA2020

A 3-pin chassis socket. Overall depth: 35mm. Mounting hole: 27mm dia. Bezel dia: 39mm. Fixing centres: 32mm x 6BA (M3). Rated: (as SA2019A). Mates with plug SA2019A.



Order

HL31J (Mains Socket SA2020) £1.80

FOUR-POLE MAINS CONNECTOR SA2367

A 4-pin line plug with shielded pins and cord grip. Plug is side entry type. Rated 2A at 250V, 3A at 110V and 4A at 6V AC and DC. Mates with socket SA2368. Plug is keyed so that it can only be inserted one way.



Order

HL33L (Mains Plug SA2367) £1.95

SA2368

A 4-pin chassis socket. Overall depth: 28mm. Mounting hole: 19mm. Bezel dia: 25mm. Rated: (as SA2367). Mates with SA2367.



Order

HL34M (Mains Socket SA2368) 98p

SIX-POLE MAINS CONNECTOR

Please note that this connector is not suitable for use on domestic equipment at voltages over 50V unless it is inaccessible without the use of a tool as defined in the Electrical Equipment (Safety) Regulations 1975.

P635



A six-pin chassis plug. Overall depth: 34mm. Mounting hole: 19mm dia. Bezel dia: 23.5mm. Rated: 1.5A at 250V (see note above), 3A at 50V AC and DC. Mates with socket P636.

Order

HL36P (Mains Plug P635) £1.35

P636



A six-pin line socket with strain relief sleeve. Rated (as P635). Mates with Plug P635.

Order

HL37S (Mains Socket P636) 98p

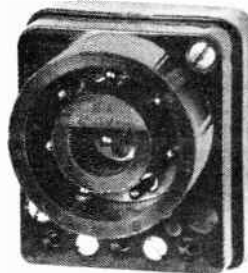
EIGHT-POLE MAINS CONNECTOR

An eight-pole mains connector which is fully shrouded and completely safe when de-mated. It is also polarised and keyed so that mis-mating is impossible. Consequently inputs and outputs may be connected simultaneously through one plug and socket pair with absolute safety. Centre pin is designated 'earth' and unfailingly, mates first and de-mates last.



P551

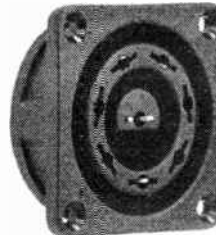
An eight-pin line plug with cord grip. Side entry type. Will accept up to eight full size insulated conductors or two to three mains cables simultaneously. Rated (per pin): 6A at 250V, 10A at 2.5V AC. Mates with socket P552.



Order

HL39N (Mains Plug P551) £2.98

P552



An eight-pin chassis socket. Overall depth: 23mm. Mounting hole: 38mm dia. Bezel: 41 x 41mm. Fixing centres: 33 x 33mm x 6BA (M3) countersunk. Rated (as P551). Mates with plug P551.

Order

HL40T (Mains Socket P552) £1.08

Strain Relief Sleeve



A moulded black strain relief sleeve suitable for use with Socket SA2597.

Order

HL50E (Sleeve 8037) 18p

INSULATING BOOTS

Flexible black covers providing neat tangle-free cable connection and giving protection against accidental contact.

Type 9455



Fits over the back of Plug P429 and Sockets SA2404 and SA2368.

Order

HL51F (Boot 9455) 28p

Type 8878



Fits over the back of Plug SA1861.

Order

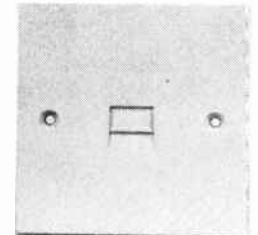
HL52G (Boot 8878) 38p

TELEPHONE ACCESSORIES



Note: 'British Telecommunications requires of any person who connects subscribers' apparatus directly or indirectly to any telecommunication system, that it runs to comply with the terms and conditions relating to the attachment of subscribers' apparatus under which service is provided by B.T.'

Flush Fitting Master Line Jack Unit 3/4A



Standard BT type Master Line Jack Unit, including bell capacitor, surge arrester and 'out of service' resistor. For flush fitting to a wall. Screw terminal connections. B.T. has the franchise for fitting the first socket on every exchange line at an installation, thus this socket will only be required by private individuals and companies for PBX extensions etc.

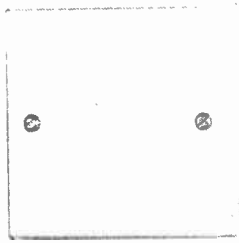
Order

FJ27E (Fish Mstr L/Jck 3/4A) £3.85

IMPORTANT NOTE

The law applying to the fitting of telephone accessories by persons other than British Telecom is changing every few months at present. Please check that the work you intend to carry out is legally permitted before ordering the components.

Flush Fitting Secondary Line Jack Unit 3/6A



A standard BT type Secondary Line Jack for flush wall mounting.

Order

FJ34M (Flush Sec L/Jck 3/6A) £2.95

Large Locking Plate

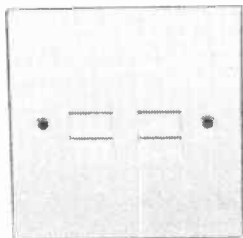


A strip which, when fitted to master or secondary Line Jack units 3/4A or 3/6A by using the two cover retaining screws, will positively lock the line plug into position so that it cannot be removed.

Order

FV95D (Large Locking Plate) 54p

Twin Flush Mounting Master Jack Unit 5/4A

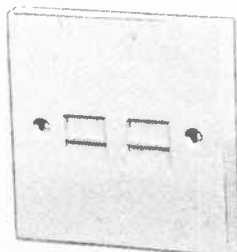


A flush mounting Master Jack Unit having two commoned lines. For use where two appliances may need to share one socket, e.g. telephone and answering machine, modem etc. The unit measures 84 x 84mm.

Order

FT46A (Twin Master Jk 5/4A) £4.95

Twin Flush Mounting Secondary Jack Unit 5/6A



A flush mounting Secondary Jack Unit having two commoned outlets, as the Master Jack Unit above.

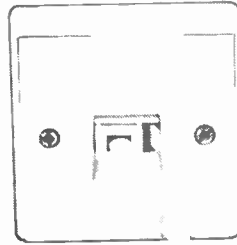
Order

FT47B (Twin Second Jk 5/6A) £3.95

IMPORTANT NOTE

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Surface Mounting Master Jack Unit 2/4A

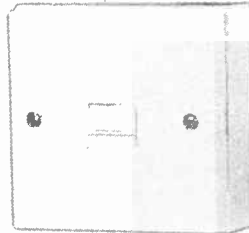


A wall or surface mounting master jack unit. The unit measures 67 x 67mm (pattress) and is 29mm deep.

Order

FT48C (Sfce Mt Mstr Jk 2/4A) £3.75

Surface Mounting Secondary Line Jack Unit 2/6A

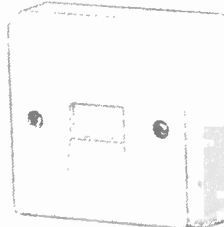


A wall mounted Secondary Line Jack Unit for extension telephones.

Order

FG28F (Line Jack Unit) £3.40

Small Surface Mounting Master Jack Unit 1/4A

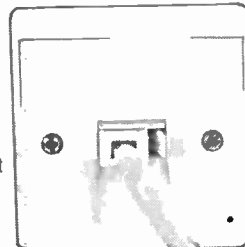


A miniature version of the Master Jack Unit 2/4A, it measures only 54 x 54mm x 29mm deep, with a 48 x 48mm pattress.

Order

FT49D (Sm Sfce Mstr Jk 1/4A) £3.95

Small Surface Mounting Secondary Jack Unit 1/6A



A Secondary Jack Unit to match the small Master Unit above.

Order

FT50E (Sm Sfce Sec Jk 1/6A) £2.95

Small Locking Plate



A locking strip for use with the small master and secondary Line Jack units 1/4A and 1/6A, fitting is identical with large locking plate.

Order

FV94C (Small Locking Plate) 48p

4-Way BT Type Jack Plug 420



A standard BT type 4 way jack plug, where each terminal is colour coded as follows:—

- Tip: Red
- 1st Ring: Blue
- 2nd Ring: White
- 3rd Ring: Green

Can be used with the 4 wire 'phone cable XR66W — see Cables Section. Conductors have to be soldered to the terminals.

Order

FJ28F (Jck Plg 4way BT420) £2.30

Dual Output Adaptor



An adaptor that can be plugged into any BT Line Jack unit to convert it to a dual outlet for 4-way or 6-way line plugs.

Order

FJ30H (Dual Adaptor 10/3A) £5.95

Line Plug/Screw Terminal Adaptor



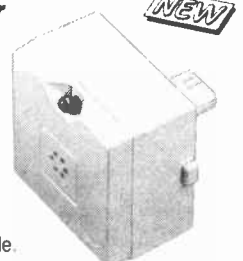
An adaptor that matches existing telephone equipment to standard BT type Line Plugs. The screw terminals are contained in a small terminal box for neat and easy connection to telephone spade terminals.

PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting this apparatus.

Order

FJ31J (L/PLg-S/T Adp ILL/BT) £4.95

Plug-In Ringer



A self contained unit which can be plugged into a Line Jack unit, having its own plug extension at rear. The buzzer will give an audible and visual (by red LED) alarm of an incoming call being made.

Order

FV96E (Telephone Buzzer) £9.95

Line Plug/USA Socket Adaptor



An adaptor allowing equipment fitted with American type phone plugs to be connected to standard BT type Line Jack Units. This adaptor must not be used on the BT telephone network.

PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting this apparatus.

Order
FJ32K (L Plg - US/Skt USA BT) £5.95

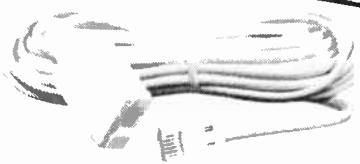
Three Metre Line Cord and Line Plug



Standard PTC Line Cord with a moulded on Line Plug at one end and spade terminals at the other. A square grommet is moulded onto the outer sheath at the spade end for entry into a telephone. Wires are coloured Red, Blue, Green and White.

Order
FG29G (PTC Line Cord) £2.50

5-Metre Telephone Line Jack Extension Cord



A 5 metre line extension cord having a standard 4-way IPC plug at one end and matching line socket at the other; a quick and simple means of extending telephone or modem leads etc.

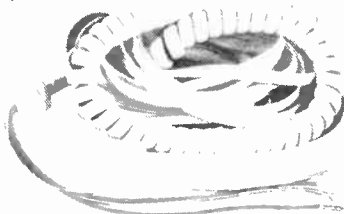
PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting this apparatus.

Order
FT45Y (5m Telephone Ext Ld) £3.95

IMPORTANT NOTE

The law applying to the fitting of telephone accessories by persons other than British Telecom is changing every few months at present. Please check that the work you intend to carry out is legally permitted before ordering the components.

Coiled Five Metre Line Cord 4/504



A 5m long Line Cord, having a Line Plug at one end and spade terminals at the other. The cord is coiled near the plug end; the coiled section extending to 1.2 metres, from 33cm relaxed. Has a standard rectangular grommet near the spade end; the four wires are in the colours Red, Blue, Green, and White.

Order
FJ29G (Coil PTC Crd 5m) £4.50

Standard 4 Way Line Plug 431A



A standard BT type 4 way Line Plug using Insulation Piercing Contacts (IPC), with strain relief. To fit the flat four way line cord, shown in the Cable Section, to the IPC plug, simply provide a clean cut across the end, and strip off 11 to 12mm of the outer sheath. Allow the four wires to separate from one another by approximately 1mm, then push and tease them gently into the plug, which has locating guides built in for each conductor.

Once fully home (the coloured wires can be seen through the slot behind the contacts) use heavy duty pliers or a small vice to press the four gold coloured contacts flush with the plug body; push down the small strain relief members immediately behind the contacts, then force down the cable clamp at rear.

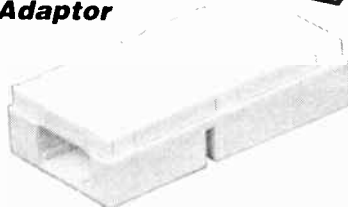
Order
FJ33L (Line Plug 4way 431A) 54p

6-Way Line Plug 631/A

A standard BT line plug as the 4-way plug FJ33L, but having 6 ways.

Order
FT52G (BT Plug 6 - Way 631/A) 85p

Line Plug to Line Plug Adaptor



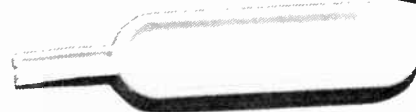
An adaptor that enables two line plugs to be connected together to facilitate cord extension, cord matching etc. Note that the plug inserted into the deeper socket will not be easy to remove without the use of a small screwdriver.

PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting this apparatus.

Order
FV97F (In Line Skt/Ext Skt) £1.95

IPC Insertion Tool

NEW



An insertion tool for attaching the BT IPC cable to master or secondary jack units having the BT type numbers with suffix /3A, which have IPC terminations as opposed to /6A types with screw terminal blocks. The tool is used to force the four wires of the line cord into the Insulation Piercing Connectors of the jack unit.

Order
FT51F (BT IPC Insrtn Tool) 38p

Please note that 4-way telephone cable can be found in the Cables Section of this catalogue.

VIDEO LEADS Video Copying Kit

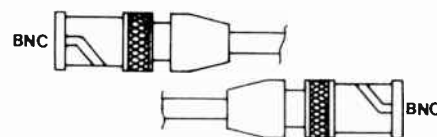


With the contents of this universal video kit you can make up to six different video leads plus six different audio connecting leads.

Video	Audio
BNC-BNC	5-pin DIN plug to 5-pin DIN plug
BNC-UHF	5-pin DIN plug to 2 phono plugs
UHF-UHF	Phono plug to phono plug
Phono-Phono	5-pin DIN plug to 3.5mm jack plug
Phono-BNC	Phono plug to 3.5mm jack plug
Phono-UHF	3.5mm jack plug to 3.5mm jack plug

Order
RK71N (Video Kopy Kit) £9.95

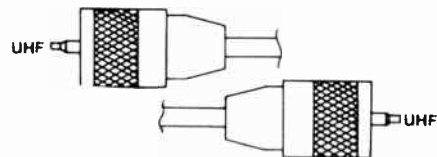
Video Lead 1



A BNC plug to BNC plug with approx. 1.5m of cable.

Order
RK84F (Video Lead 1) £2.90

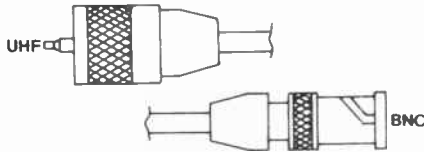
Video Lead 2



UHF (PL259) plug to UHF plug with approx. 1.5m of cable.

Order
RK85G (Video Lead 2) £1.95

Video Lead 3

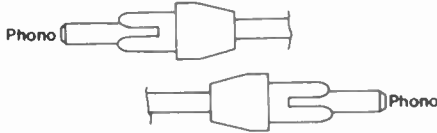


UHF (PL259) plug to BNC plug with approx. 1.5m of cable.

Order

RK70M (Video Lead 3) £2.45

Video Lead 4

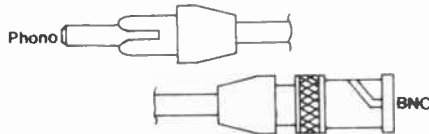


Phono plug to phono plug with approx. 1.5m of cable.

Order

RK86T (Video Lead 4) 98p

Video Lead 5



BNC plug to phono plug with approx. 1.5m of cable.

Order

RK87U (Video Lead 5) £1.95

Video Lead 6 NEW



Phono plug to coax. Plug with approx. 1.2m for cable.

Order

FV90X (Phono/Coaxplg Vid Ld) 65p

COMPUTER LEADS

Computer Lead 1



7-pin DIN plug to 2 x 3.5mm jack plugs and a 2.5mm jack plug. Length: 1m (approx).

Order

FG18U (Computer Lead 1) £1.65

Computer Lead 2



7-pin DIN plug to 3-pin DIN plug and 2.5mm jack plug. Length: 1m (approx.)

Order

FG19V (Computer Lead 2) £1.45

Computer Lead 3

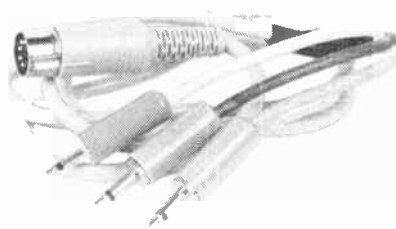


7-pin DIN plug to 5-pin DIN plug and 2.5mm jack plug. Length: 1m (approx.)

Order

FG20W (Computer Lead 3) £1.95

Computer Lead 4

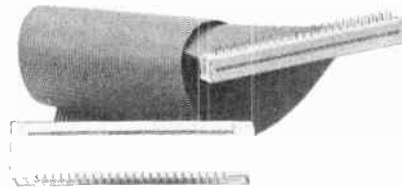


5-pin DIN plug to 2 x 3.5mm jack plugs and 2.5mm jack plug. Length: 1m (approx.)

Order

FG21X (Computer Lead 4) £1.90

Computer Lead 5 NEW



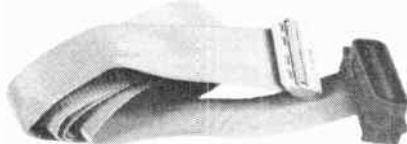
A metre of 50 way IDC cable having a 50 way IDC edge connector at one end, and a 50-way transition header at the other end. Particularly suitable for use with the Amstrad CPC 464.

Order

FT66W (2x25W+IDC&TransHeadr) £9.95

PRINTER CABLES

26-Way

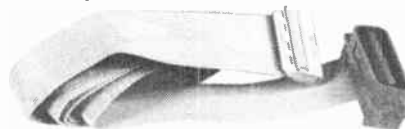


A 26-way ribbon cable, connected to a 26-way (2 x 13) way IDC socket at one end and a Centronics type plug at the other. Ideal for use with the BBC Micro. Length 30cm.

Order

FG30H (Printer Cable 1) £8.95

20-Way

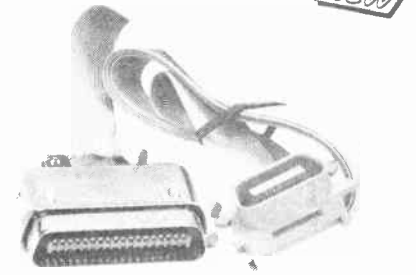


A 20-way ribbon cable, connected to a 20 way IDC socket at one end and a Centronics type plug at the other. Pins 2 and 4 are unconnected, and pin 20 is displaced by one position. Ideal for use with the Dragon. Length 30cm.

Order

FG31J (Printer Cable 2) £8.95

MSX Printer Cable NEW



This cable comprises a 14-way flat cable 1 metre in length, and terminated in a 14-way Centronics type connector at one end and a 36-way Centronics type connector at the other end.

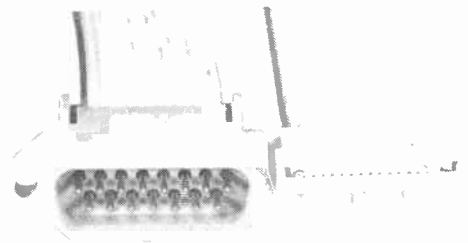
Order

FV93B (MSX Printer Cable) £11.95

BBC COMPUTER CABLES

A selection of connectors made up for our BBC Motherboard Project but which may also be suitable for many other applications.

BBC Analogue Port Cable

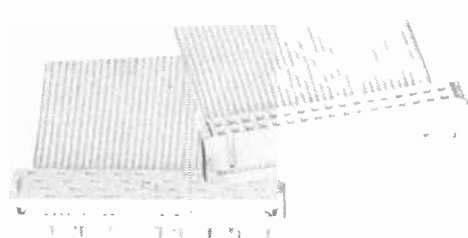


This cable has a 15 way 'D' range plug connected by 1/2 metre of flat cable to a 16 way four row PCB transition header.

Order

FJ24B (BBC Anlg Port Cable) £5.80

BBC 1MHz Port Cable

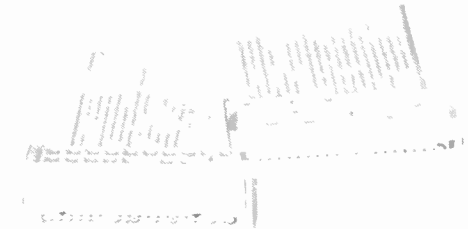


Comprises a 34-way IDC socket connected by 1/2 metre of flat cable to a 34 way four row PCB transition header.

Order

FJ25C (BBC 1MHz Port Cable) £4.95

BBC I/O Port Cable



This cable has a 20-way IDC socket connected to a 20 way four row PCB transition header by 1/2 metre of flat cable.

Order

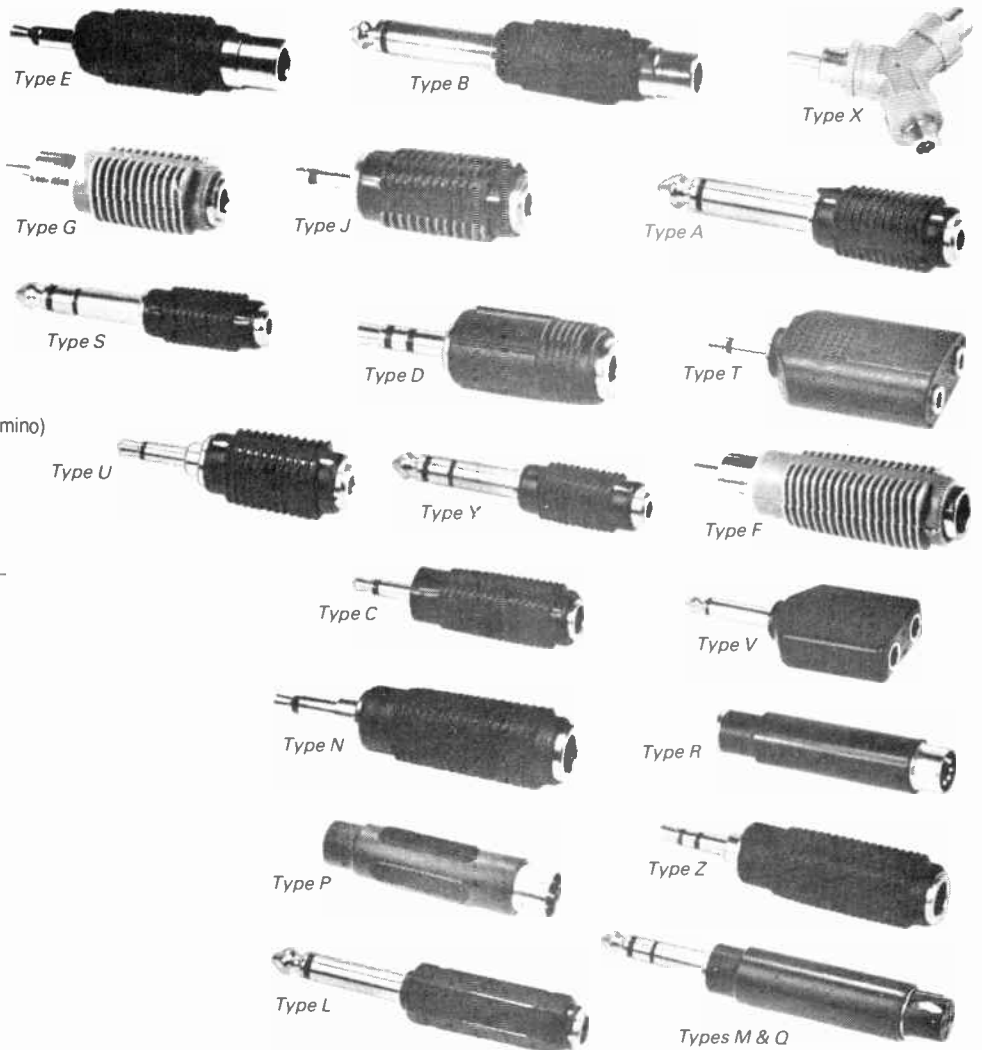
FJ26D (BBC I/O Port Cable) £2.95

ADAPTOR PLUGS

Type	Socket	Plug
E	Phono	Mono 3.5mm
B	Phono	Mono 1/2in
X	2xPhono	Phono
G	Mono 3.5mm	Phono
J	Mono 3.5mm	2.5mm
A	Mono 3.5mm	Mono 1/2in
S	Mono 3.5mm	Stereo 1/2in
D	Mono 3.5mm	Stereo 3.5mm
T	2xMono 3.5mm	Mono 3.5mm
U	Stereo 3.5mm	Mono 3.5mm
Y	Stereo 3.5mm	Stereo 1/2in
F	Mono 1/2in	Phono
C	Mono 1/2in	Mono 3.5mm
V	2xMono 1/2in	Mono 1/2in
N	Stereo 1/2in	Mono 3.5mm
R	Stereo 1/2in	5-pin DIN 180° (A)
P	Stereo 1/2in	5-pin DIN 360° (domino)
Z	Stereo 1/2in	Stereo 3.5mm
L	Stereo 1/2in	Mono 1/2in
M	5-pin DIN 180° (A)	Stereo 1/2in
Q	5-pin DIN 360° (domino)	Stereo 1/2in

Order

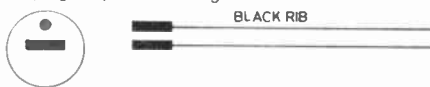
RW04E (Adaptor E)	44p
RW01B (Adaptor B)	44p
YW39N (Adaptor X)	70p
RW06G (Adaptor G)	35p
RW08J (Adaptor J)	35p
RW00A (Adaptor A)	35p
YW34M (Adaptor S)	48p
FK15R (Adaptor D)	54p
YW35Q (Adaptor T)	78p
FK14Q (Adaptor U)	45p
RK55K (Adaptor Y)	48p
RW05F (Adaptor F)	35p
RW02C (Adaptor C)	44p
YW37S (Adaptor V)	78p
RW12N (Adaptor N)	44p
YW33L (Adaptor R)	£1.20
HL53H (Adaptor P)	£1.28
RK56L (Adaptor Z)	48p
FK11M (Adaptor L)	48p
FK12N (Adaptor M)	£1.30
FK13P (Adaptor Q)	£1.20



AUDIO LEADS

DIN to Open

Loudspeaker plug to open end. Length: 3m.



Order

RW27E (Dinpak P) 48p

DIN to DIN

Loudspeaker plug to loudspeaker plug. Length: 10m.

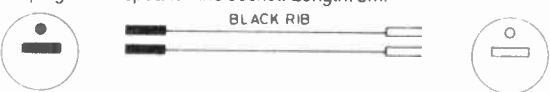


Order

RW45Y (Dinpak 273) 95p

DIN to DIN

Loudspeaker plug to loudspeaker line socket. Length: 3m.

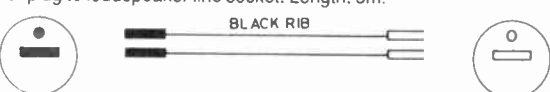


Order

RW44X (Dinpak 262) 65p

DIN to DIN

Loudspeaker plug to loudspeaker line socket. Length: 5m.



Order

RW47B (Dinpak 275) 75p

DIN to DIN

Loudspeaker plug to loudspeaker line socket. Length: 10m.



Order

RW25C (Dinpak M) 85p

DIN to DIN

5-pin DIN plug to 5-pin DIN plug. Length: 1.2m.



Order

RW14Q (Dinpak A) 95p

DIN to DIN

5-pin DIN plug to 5-pin DIN plug with reversal (mirror-image) connections. Length 1.2m.



Order

RW43W (Dinpak 254) 95p

DIN to DIN

5-pin DIN plug to 5-way DIN line socket. Length 1.2m.



Order

RW16S (Dinpak C) £1.10

DIN to 3.5mm Jack

5-pin DIN plug (pins 1 & 4) to 3.5mm jack plug. Length: 1.2m.

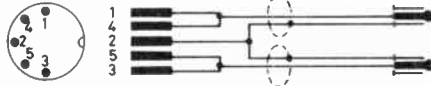


Order

RW22Y (Dinpak J) 85p

DIN to 3.5mm Jack

5-pin DIN plug (pins 1 & 4 and pins 3 & 5) to two 3.5mm jack plugs. Length: 1.3m.



Order

RW24B (Dinpak L) 98p

DIN to Phono

5-pin DIN plug (pins 1 & 4) to 2 phono plugs. Length 1.2m.



Order

RW18U (Dinpak E) 98p

DIN to Phono

5-pin DIN plug (pins 3 & 5) to 2 phono plugs. Length: 1.2m.



Order

RW19V (Dinpak F) 98p

DIN to Phono

5-pin DIN plug to 4 phono plugs. Length: 1.2m.



Order

RW17T (Dinpak D) £1.40

DIN to Phono

5-pin DIN plug to 4 phono line sockets. Length: 1.2m.



Order

RW20W (Dinpak G) £1.60

Phono to Phono

Phono plug to phono plug. Length: 1.2m.

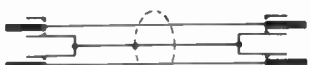


Order

RW48C (Plugpak 279) 85p

Phono to Phono

Two phono plugs to two phono plugs. Length: 1.2m.



Order

RW50E (Plugpak 282) 98p

Phono to Phono

Four phono plugs to four phono plugs. Length: 1.2m.

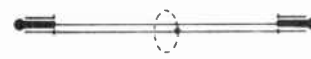


Order

RW51F (Plugpak 283) £1.65

3.5mm Jack to 3.5mm Jack

3.5mm jack plug to 3.5mm jack plug. Length 1.2m.



Order

RW28F (Plugpak Q) 64p

Headphone Lead

Headphone extension lead. Stereo jack plug to stereo line socket. Coiled lead. Length: 6m.



Order

RW31J (Plugpak T) £2.20

Guitar Lead

Guitar lead. Standard (straight) jack plug to standard (angled) jack plug with coiled screened lead. Length: 6m.

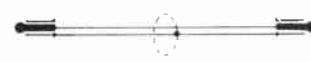


Order

RW34M (Plugpak X) £2.25

Heavy Duty Guitar Lead

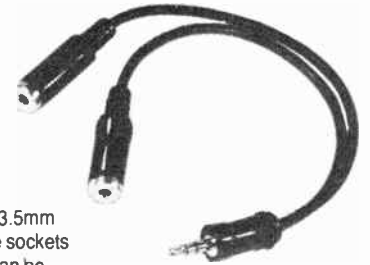
Professional heavy duty guitar lead. Standard mono (straight) jack plug to standard mono (angled) jack plug with coiled screened lead. Length: 6m.



Order

RW35Q (Plugpak HD Guitar) £5.45

Mini-Headphone Splitter (Stereo)

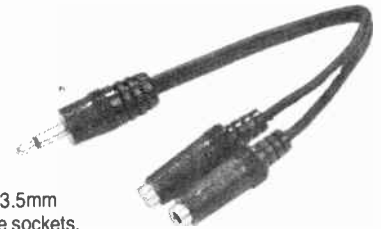


Headphone adaptor lead. Stereo 3.5mm jack plug to two stereo 3.5mm line sockets (so that two sets of headphones can be connected to one outlet). Length: 0.15m.

Order

RK58N (Plugpak Y) £1.60

Mini-Headphone Splitter (Mono)

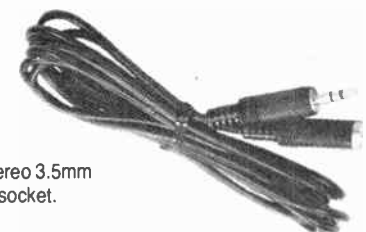


Headphone adaptor lead. Mono 3.5mm jack plug to two mono 3.5mm line sockets. Length: 0.15m.

Order

RK27E (Plugpak Z) 95p

Mini-Headphone Extension Lead



Headphone extension lead. Stereo 3.5mm jack plug to stereo 3.5mm jack socket. Length 2m.

Order

RK57M (Plugpak W) £1.35

ELECTRICAL ACCESSORIES

Distribution Board	137	Lamp Dimmers	138	Security Light Switches	138
Extension Leads	140	Light Switches	138	Timeswitches	140
Fluorescent Starter	139	Pattresses	139	Thermostat	139

With the help of our Book NB245 (Home Electrics by Geoffrey Burdett) and our house-wiring cables described in the Cable Section you can rewire or make repairs or alterations to your house wiring with complete confidence. Remember that the lives of your family may depend on the quality and safety features built into the accessories you choose. The accessories we stock for you are of the highest standard, meet all the relevant specifications and comply with the latest safety standards required by law. Nevertheless they are offered at highly competitive prices which make them a genuine best buy.

All accessories are rated at 240V AC unless stated. (Not suitable for DC).

House Wiring

No permission is required in Britain to carry out home electrical installation work, though where the house is rented, permission may be necessary from the owner. Neither electricity boards nor local authorities or any other official body has any jurisdiction in respect of wiring. The work should, however, conform to the IEE wiring regulations published by the Institute of Electrical Engineers and recognised as a code of good wiring practice by all official bodies, including electricity boards and government departments.

The regulations, contrary to popular belief, are not statutory, and an electricity board has no powers to refuse connection to its mains of any installation, or parts of it, which do not strictly conform to the current IEE wiring regulations, but a board can, and will, refuse connection to its mains of any installation which is dangerous and as such does not conform to the Electricity Supply Regulations. These are statutory, and are quoted in the application form signed by a consumer when requiring a supply of electricity.

An installation conforming to IEE wiring regulations is deemed to satisfy the requirements of the Electricity Supply Regulations and the electricity board must connect it to the mains. In these circumstances the board must connect the installation, whether work has been carried out by a recognised contractor or by the householder himself.

From a contractor the board requires a test certificate, and may waive its own test and inspection. The householder who is unable to complete a test certificate can expect the board to test the installation, though they are not obliged to do so. The test is at the option of the electricity board, and is mainly to satisfy them that the installation will not adversely affect the supply to other consumers. It is important to note that good workmanship using correct materials is necessary to conform to the regulations.

The various cables used in house wiring with their sizes, current ratings, and the principal circuits in which they are used are as follows:-

Cable size mm ²	Current rating amps	Circuits
1.0	16	Lighting
1.5	20	Lighting and 15A single socket ccts
2.5	28	Ring circuits and 20A radial circuits
4.0	36	Radial circuits 30A
6.0	46	Cooker circuits, shower unit ccts
10	64	Cooker circuits
16	85	Meter leads
25	108	Meter leads

These current ratings apply where the cables are clipped direct to the surface. Ratings are lower for enclosed cables and some other situations, but are all suitable for the circuits specified.

TERMINAL BLOCKS Screw Type

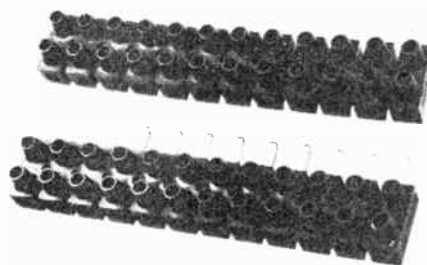


12-way flexible moulded terminal block strips that may be easily cut into shorter lengths. Screw terminals. Three types are available: 5 Amp, 15 Amp, and 30 Amp.

Order

HF01B	(Terminal Block 5A)	28p
HL54J	(Terminal Block 15A)	48p
HL55K	(Terminal Block 30A)	85p

Terminal Block Plug and Socket



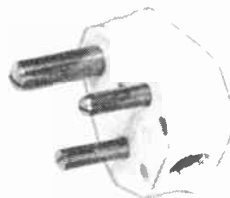
A pair of 12-way flexible moulded terminal block strips that may be easily cut into shorter lengths. One block has one screw terminal and a plug per position and the other block has one screw terminal and a socket per position. Rating: 5 Amps.

Order

HL56L	(Terminal Block Conn)	£1.40
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PLUGS 5 Amp

A 5A mains plug moulded in hard wearing heat-resistant bakelite. Fitted with cordgrip. Not fused. Conforms to BS546A.



Order

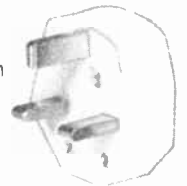
HL57M	(5 Amp Plug Nylon)	85p
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FAST SERVICE LOWEST PRICES

13 Amp Nylon

A 13A mains plug moulded in hard-wearing heat-resistant white nylon. Fitted with 13A fuse and cord-grip. Conforms to BS1363A.



Order

RW67X	(13 Amp Plug Nylon)	68p
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13 Amp Rubber

A 13A mains plug moulded in unbreakable tough white rubber. Fitted with a 13A fuse and cord-grip. Conforms to BS1363A.



Order

HL58N	(Rubber 13A Plug)	98p
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Kettle Connector



A 3-pin connector that fits most electric kettles. Moulded in black and rated at 13A.

Order

HL60Q	(Kettle Connector)	£1.20
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ADAPTORS Flex Connector



A 10A 3-pin flex connector. The pins are shrouded and the earth pin is offset so that the connector is non-reversible. Connect mains to socket side and appliance to plug side. Fitted with cord-grip and moulded in hardwearing heat-resistant white nylon.

Order

HL61R	(Flex Connector)	£1.60
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2-Way Multiplug



A 13A 3-pin adaptor that plugs into a standard 13A socket and allows up to two appliances to be plugged into it. Maximum total load: 13A. Unfused. Sockets are shuttered. White.

Order
HL62S (Mains Adaptor 2-way) £1.40

3-Way Multiplug



A 13A adaptor that plugs into a standard 13A socket and allows up to three appliances to be plugged into it. Maximum total load: 13A. Unfused. Sockets are shuttered. White.

Order
HL63T (Mains Adaptor 3-way) £2.40

Shaver Adaptor



Standard 13A 3-pin plug internally connected to a 2-pin socket suitable for accepting the plugs fitted to electric shavers. Sockets are shuttered. Fitted with 1A fuse. White. Imported type. This adaptor is suitable for use with standard 2-pin continental mains plugs.

Order
HL64U (Shaver Adaptor) 98p

JUNCTION BOXES

5 Amp



A 4-terminal junction box rated 5A per terminal. White. Size 57mm (2 1/4 in) diameter.

Order
HL65V (Junction Box Small) 68p

15 Amp



A 4-terminal junction box rated 15A per terminal. White. Size 76mm (3 in) diameter.

Order
HL66W (Junction Box Lge) 98p

30 Amp



A 3-terminal junction box rated 30A per terminal. For interconnections in ring main circuits. White. Size 76mm (3 in) diameter.

Order
HL67X (Junction Box RM) £1.20

SOCKET OUTLETS

Unswitched Single

A 13A socket without switch. White. BS1363. Supplied with fixing screws. Shuttered.

Order
HL68Y (Single Skt Unswitched) £1.95

Unswitched Double



A double 13A socket without switches. White. BS1363. Supplied with fixing screws. Shuttered.

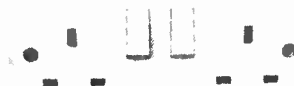
Order
HL69A (Dble Skt Unswitched) £3.80

Switched Single

A 13A socket with double pole switch that switches both live and neutral for absolute safety. White. BS1363. Supplied with fixing screws. Shuttered.

Order
HL71N (Single Sw Socket) £2.50

Switched Double



A double 13A socket each with its own double pole switch that switches both live and neutral for absolute safety. White. BS1363. Supplied with fixing screws. Shuttered.

Order
HL72P (Double Sw Socket) £4.95

Trailing Single Socket



A single 13A socket without switch. Finished in resilient white thermoplastic. With cord grip. Shuttered. Designed to be fitted to the end of an extension lead.

Order
HL73Q (Trailing Skt Single) £1.80

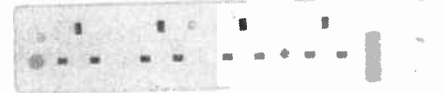
Trailing Double Socket



A double 13A socket without switches. Finished in a resilient white thermoplastic. With cord grip. Shuttered. Designed to be fitted to the end of an extension lead.

Order
HL74R (Trailing Dble Skt) £3.80

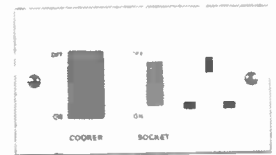
Distribution Board



A plug board with four 13A sockets moulded in unbreakable white PVC. Cord grip on cable inlet at right-hand end enables use with trailing lead or four knockouts are provided in the base by which the unit may be fixed to a wall etc. Sockets have safety shutters and a 13A 1 in fuse is fitted and may be removed with power connected. Total load must not exceed 13A.

Order
RW68Y (Dis Board 4-way) £8.95

Cooker Control



A cooker control produced to BS4177C. The cooker switch is a large double pole switch rated at 45A. A switched 13A socket is also provided for electric kettles etc. The socket is shuttered. For ease of wiring separate earth terminals are provided for socket and cooker. Both switches have red rockers and are double pole to switch both live and neutral for absolute safety. Supplied with fixing screws. White. Available without neon indicators.

Order
HL76H (Cooker Switch) £8.95

PHONE NOW
0702 552911



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Shaver Socket for Bathrooms



A dual voltage shaver socket to BS3052. Two sockets are provided one giving 115V and one giving 240V; in each case they suit the appropriate plug.

Both sockets are shuttered and their operation automatically switches on and off the double wound safety isolating transformer, that is protected by self-resetting overload device. The sockets and shutters are positioned to prevent the transformer being overloaded by the insertion of two shavers simultaneously. Designed for use in bathrooms where it meets the relevant IEE regulations. Supplied with fixing screws. White.

Order

HL78K (Shaver Skt Isolated) £19.95

Flex Outlet Switched

A connecting unit, max. load 13A with a flex outlet in a white plate cover and a double pole switch BS1363. Supplied with fixing screws.



Order

HL83E (Switched Flex Outlet) £4.50

Blanking-off Plate



A white plate that will blank off any spare single mounting box. BS1363. Supplied with fixing screws.

Order

HL86T (Blanking Plate) 80p

SWITCHES

20A Plain



A plain white plate switch with a single double pole switch rated 20A, plus flex outlet and cord-grip. Fixing screws supplied. BS3673.

Order

HL87U (20A Plateswitch) £3.50

20A 'Water Heater'

A white plate switch marked 'water heater' and containing a red neon indicator. With a single double pole switch rated 20A, plus flex outlet and cord-grip. Fixing screws supplied BS3673.



Order

HL88V (20A Water Htr Switch) £5.50

Single Light Switch 1-Way



A single one-way switch rated at 5A and also suitable for fluorescent fittings. White. Fixing screws supplied. BS3673.

Order

HL89W (Light Swch ST Single) £1.45

Single Light Switch 2-Way

A single two way switch rated at 5A and also suitable for fluorescent fittings. For use where two switches are used to operate the light's e.g. in hall and stairways. White. Fixing screws supplied. BS3673.

Order

HL90X (Light Swch DT Single) £1.50

Double Light Switch



Two separate two-way switches rated at 5A and also suitable for fluorescent fittings. White. Fixing screws supplied. BS3676.

Order

HL91Y (Light Swch Dual) £2.50

Triple Light Switch



Three separate two-way switches rated at 5A and also suitable for fluorescent fittings. White. Fixing screws supplied. BS3673.

Order

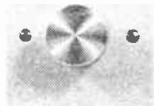
HL92A (Light Switch Triple) £3.50

LIGHT DIMMERS

Attractive modern light dimmers for filament lamps e.g. standard domestic light bulbs, having a total rating up to the rating shown. All types (except outdoor type) fit our 16mm flush or 20mm surface pattresses. These dimmers are extremely simple to fit. Switch off electricity at main fuse box, remove existing switch, connect the two wires to the dimmer and screw on to existing pattress. The dimmer switches the light on and off or sets brightness to desired level depending on position of knob.

Rotary Control

White plate with elegant spun aluminium knob. Rotary knob controls up to 250W.



Order

FQ10L (250W Rotary Dimmer) £7.95



0702 552911

White Push-on Push-off Single

White plate with elegant spun aluminium knob. Switching is push-on push-off so that light may be switched on or off at any brightness setting. Rated 250W.



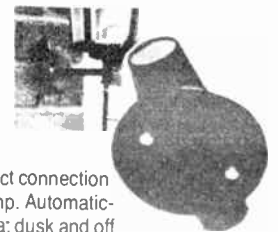
Order

FQ12N (250W Push Dmr Sngl) £12.95

Warning: None of the dimmers shown above are suitable for use with fluorescent lamps.

SECURITY LIGHT SWITCHES

Outdoor Automatic Switch

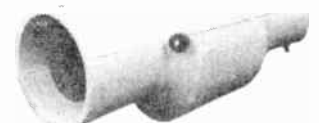


A junction box designed for direct connection to an outdoor lamp. Automatically switches on at dusk and off at dawn for security and for safety when you return home at night. Rated 1000W.

Order

FQ16S (Auto Security Switch) £19.95

Auto Light Switch



This useful device simply fits between any standard BC lampholder and the light bulb. With the light switch in the 'on' position, the controller will measure the ambient level of daylight with the built-in light sensor approximately once every 30 minutes, and if low enough, the lamp will come on. When it becomes daylight again, the controller will also switch the lamp off.

Rating: 60W max. supplied with instructions. 96mm long x 49mm dia.

Order

FV98G (Auto-Light Switch) £15.95

Security Light Switch



Fits a standard BC light socket, and the light bulb then fits into the unit. The security light switch will automatically turn the lamp on as soon as it gets dark, by sampling the ambient light level with a built-in sensor. Thereafter, it continues switching on and off at timed intervals until daylight returns. Simulates activity within the household and provides an effective deterrent to would-be intruders. Rating: 60W max. supplied with instructions. 96mm long x 49mm dia.

Order

FV99H (Security Light Switch) £24.95

PATRESSES Flush Mounting

A range of flush mounting boxes which are designed to be buried in the wall with the edges flush with the plaster. Three types are available. All are to BS1363.

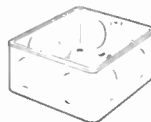
Single 16mm



For all light switches. 16mm deep with earth terminal. One adjustable lug, brass inserts in both lugs. One 20mm and two 16mm oval knock-outs. Moulded in white PVC.

Order
YB09K (FI Pattress 16mm Sgl) 98p

Single 25mm



For all socket outlets, 25mm deep. One adjustable lug, brass inserts fitted in both lugs. Eight 20mm round knock-outs. Moulded in white PVC.

Order
YB10L (FI Pattress 25mm Sgl) 95p

Double 25mm



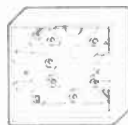
For all double panels except cooker and shaver units, 25mm deep. One adjustable lug, brass inserts fitted in both lugs. Twelve 20mm round knock-outs. Moulded in white PVC.

Order
YB11M (FI Pattress 25mm Dbl) £1.20

Surface Mounting

A range of surface mounting boxes all moulded in bright white plastic. Five types are available. All to BS1363.

Single 20mm



For all light switches. 20mm deep with earth terminal.

Order
YB14Q (Sur Patt 20mm Sngl) 95p

Single 29mm



For all socket outlets. 29mm deep.

Order
YB15R (Sur Patt 29mm Sngl) 95p

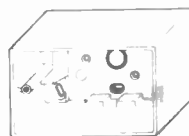
Double 29mm



For all double panels except cooker and shaver units. 29mm deep.

Order
YB16S (Sur Patt 29mm Dble) £1.60

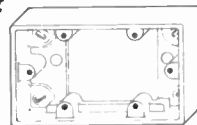
Double 47mm



For cooker and shaver panels. 47mm deep.

Order
YB17T (Sur Patt 47mm Dble) £2.60

Conversion Unit

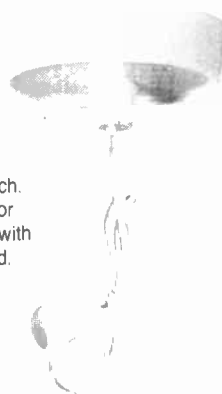


May be fitted onto a single flush mounting box so that a double plate may be fitted.

Order
YB18U (Conversion Pattress) £2.95

LIGHT FITTINGS Ceiling Switch

A ceiling mounted, cord operated light switch for use in bathrooms (wall mounted switches are not permitted in bathrooms). Fitting has a one-way switch. Rated at 5A and suitable for fluorescent fittings. White with tough white nylon pull-cord. Fixing centres 51mm.



Order
FQ00A (Ceiling Switch 1-way) £2.95

BC Lampholder



A standard BC lampholder to BS52. With cord-grip and sprung plungers, plus short skirt. White.

Order
FQ02C (Lampholder 702) 48p

Battenholder



A standard BC lampholder to BS52 in a plastic mount with short skirt. This battenholder has sprung plungers and is finished in white. Diameter of base 63.5mm. Fixing centres 51mm. Overall height 47mm.

Order
LB63T (Bayonet L/Hldr) 68p

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159 King St., Hammersmith ☎01 748 0926

Ceiling Rose



A white satin-finish ceiling rose that does not need a separate backplate or pattress. Designed to BS67 1969 with three separate terminals with captive screws housed in a transparent shield providing individual loop-in facilities. A separate earth terminal is also provided. Positive cable restraint. Diameter of base 82.5mm. Fixing centres 51mm.

Order
FQ05F (Ceiling Rose) 98p

Fluorescent Tube Starter

A starter switch suitable for use with most domestic fluorescent tubes rated 4 to 80W. Standard 2-pin Pygmy connector. Fitted with radio interference suppressors. In a white nylon can. BS3772.



Order
FQ07H (Starter 80W) 28p

E.S. to B.C. Adaptor

An adaptor to convert Edison screw lampholder to bayonet fitting. Brown bakelite moulding, suitable for 250W AC.



Order
BK69A (ES to BC Adaptor) £2.45

B.C. to E.S. Adaptor

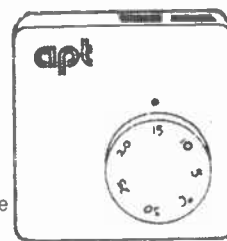
An adaptor to convert a bayonet lampholder to Edison screw fitting. Black bakelite moulding, suitable for 250V AC.



Order
BK70M (BC to ES Adaptor) £1.50

ROOM THERMOSTAT

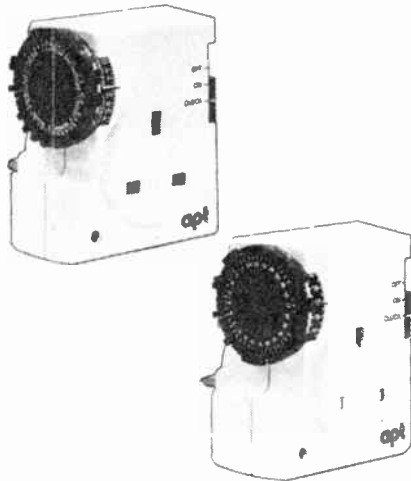
A room thermostat with an easy-to-use control for all kinds of heating systems. Mounted on the wall, this thermostat, once set to the required temperature, will automatically trigger the heating system to come on and go off in order to maintain that temperature. Can be linked to any pump to control gas, solid fuel or oil fired central heating, warm-air and electric underfloor or ceiling systems. Includes an 'accelerator' which reacts quickly to changes in room temperature so as to maintain an even level. Fits a standard pattress. Knob marked 5° to 30°C. Rated 20A resistive, 4A inductive, 240V AC. Switch SPST. Supplied with instructions.



Order
YB20W (Room Thermostat) £6.95

TIMESWITCHES

Mechanical Timeswitch



A mechanical timeswitch that plugs directly into a standard 13A socket outlet, and the appliance to be controlled then simply plugs into the timeswitch. The timeswitch uses a 50Hz clock which drives a calibrated knob, which has 48 miniature switch sliders around the periphery – power is on when any of these are depressed and currently adjacent to a scribe line which points to the time shown on the calibrated knob, conversely, if said slider is pulled out the power will be off. 24 hour or 7 day versions are available, in the case of the 24 hour timer each switch segment corresponds to 30 minutes of on or off time, and for the 7 day version it represents a period of approximately 3 hours 30 minutes. In this way the on/off periods required can be set against the calibrated 24 hour or 7 day dials before the timer is plugged in and switched on, and then the knob should be turned to display current time, or day/time. A 3-position switch provides for manual override by selecting either all off, all on or 'normal clock' function. Max. load: 3kW or 13A (2A inductive).

Order

YB19V (24 Hour Timeswitch)	£19.95
YK57M (7 Day Timeswitch)	£19.95

Programmable Timer



A smart mains timer-controller which employs a quartz clock with LCD display, which can be programmed to provide up to three separate on/off time periods in the 24 hour cycle. The unit is powered by a single 1.5V battery as opposed to the mains supply, so that the timer can be moved from socket to socket around the house or left unused without disrupting any of the settings. Initially, the time must be set on insertion of the battery; the display is a 12 hour clock with 'am/pm' indicator. Thereafter, the 'on' and 'off' times at the three time periods may be set. A manual override facility can be used to suspend any program instruction without altering its setting, or to switch off the appliance when timer is in the 'on' mode. Includes output 'live' neon indicator. Supplied with instructions.



Specifications

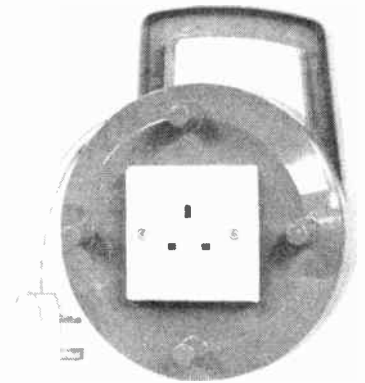
Rating: 13A @ 220-240V AC 50Hz. 3kW max.
 Resolution,
 Set Time: 1 minute.
 Replacement
 Battery: Size AAA.
 Dimensions: H120 x W50 x D40mm excluding pins.
 Battery
 Life: >12 months.
 Weight: 170gms.

Order

WY23A (Programmable Timer)	£25.95
----------------------------	--------

EXTENSION LEADS

5A



A 14 metre mains extension lead in a red plastic drum with carrying handle. A standard 13A socket is fixed on one side of the drum and the white PVC sheathed cable is terminated in a standard 13A plug. The top of the drum revolves on the base so that the cable may be wound onto and unwound from the reel. Max load with cable fully wound: 600W, or with cable fully unwound: 1440W. Size: 205 x 165 x 100mm.

Order

XY08J (Extn Lead 5A)	£12.95
----------------------	--------

13A

A 10 metre mains extension lead in a blue plastic drum with carrying handle. A standard 13A socket is fixed on one side of the drum and the white PVC sheathed cable is terminated in a standard 13A plug. The top of the drum revolves on the base so that the cable may be wound onto and unwound from the reel. Max. load with cable fully wound: 1kW or with cable fully unwound: 3kW. Size: 235 x 190 x 100mm.

Order

XY09K (Extn Lead 13A)	£13.95
-----------------------	--------

HARDWARE

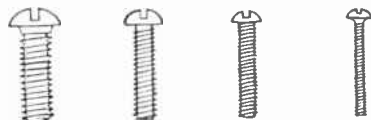
Aluminium Sheet 144
Graphic Transfers 144

Grommets 143
Sealing Strip 144

Self-Adhesive Pads 144
Velcromounts 144

NUTS AND BOLTS

BA Round-Head Bolts



2BA 4BA 6BA 8BA

Nickel-plated brass round-head bolts. The following sizes are available.

2BA 1/2in.	4BA 1/2in.	6BA 1/2in.	8BA 1/2in.
2BA 1in.	4BA 1in.	6BA 1in.	8BA 1in.
	4BA 1 1/2in.	6BA 1 1/2in.	

All types supplied in packs of ten.

Order

BF00A (Bolt 2BA 1/2in.)	48p
BF01B (Bolt 2BA 1in.)	58p
BF02C (Bolt 4BA 1/4in.)	24p
BF03D (Bolt 4BA 1/2in.)	28p
BF04E (Bolt 4BA 1in.)	35p
LR52G (Bolt 4BA 1.1/2in.)	65p
BF05F (Bolt 6BA 1/4in.)	18p
BF06G (Bolt 6BA 1/2in.)	24p
BF07H (Bolt 6BA 1in.)	48p
LR53H (Bolt 6BA 1.1/2in.)	98p
BF08J (Bolt 8BA 1/4in.)	38p
BF09K (Bolt 8BA 1/2in.)	32p

Countersunk-Head BA Screws



Cadmium-plated steel countersunk-head screws. The following sizes are available.

2BA 1/2in.	4BA 1/2in.	6BA 1/2in.	8BA 1/2in.
	4BA 1in.	6BA 1in.	

All types supplied in packs of ten.

Order

LR54J (C/S Screw 2BA 1/2in.)	18p
LR55K (C/S Screw 4BA 1/4in.)	15p
BF10L (C/S Screw 4BA 1/2in.)	18p
BF11M (C/S Screw 4BA 1in.)	20p
LR56L (C/S Screw 6BA 1/4in.)	24p
BF12N (C/S Screw 6BA 1/2in.)	28p
BF13P (C/S Screw 6BA 1in.)	38p
LR00A (C/S Screw 8BA 1/2in.)	48p

Panel Screws



Chrome-plated steel screws. Supplied individually.

Two types are available:

4BA 1/2in. slotted panel headed (BF14Q).
4BA 1in. slotted domed countersunk (LR75S).

Order

BF14Q (Panel Screw)	5p
LR75S (C/S Panel Screw)	8p

BA Full Nuts



Nickel-plated brass full nuts available in the following sizes.

2BA 4BA 6BA 8BA

All types supplied in packs of ten.

Order

BF16S (Nut 2BA)	18p
BF17T (Nut 4BA)	15p
BF18U (Nut 6BA)	12p
BF19V (Nut 8BA)	18p

BA Washers



Nickel-plated brass washers available in the following sizes.

2BA 4BA 6BA 8BA

All types supplied in packs of ten.

Order

BF20W (Washer 2BA)	9p
BF21X (Washer 4BA)	9p
BF22Y (Washer 6BA)	9p
BF23A (Washer 8BA)	9p

Cup Washer

A chrome-plated steel cup washer for use with our domed countersunk panel screw. Sold individually.

Order

LR76H (Cup Washer)	2p
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BA Shake-Proof Steel Washers



Cadmium-plated and passivated steel shake-proof washers available in the following sizes.

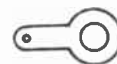
2BA 4BA 6EA 8BA

All types supplied in packs of ten.

Order

BF24B (Shake 2BA)	9p
BF25C (Shake 4BA)	9p
BF26D (Shake 6BA)	9p
LR01B (Shake 8BA)	9p

BA Solder Tags



A heavily tinned steel solder tag available in the following sizes.

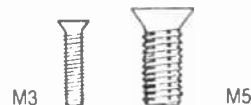
2BA 4BA 6BA 8BA

All supplied in packs of ten.

Order

BF27E (Tag 2BA)	9p
BF28F (Tag 4BA)	9p
BF29G (Tag 6BA)	9p
LR02C (Tag 8BA)	9p

Countersunk-Head Metric Screws



Cadmium-plated and passivated steel countersunk-head screws with Pozidriv type head available in the following sizes.

M4 x 6mm	M3 x 6mm	M2.5 x 6mm
	M3 x 9mm	
M5 x 12mm	M4 x 12mm	M3 x 12mm
M5 x 25mm	M4 x 25mm	M3 x 25mm
		M3 x 40mm

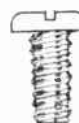
M2 x 6mm also available.

All types supplied in packs of ten.

Order

BF31J (Pozi Screw M5 12mm)	20p
BF32K (Pozi Screw M5 25mm)	24p
BF33L (Pozi Screw M4 6mm)	18p
BF34M (Pozi Screw M4 12mm)	18p
BF35Q (Pozi Screw M4 25mm)	18p
BF36P (Pozi Screw M3 6mm)	18p
LR57M (Pozi Screw M3 9mm)	15p
BF37S (Pozi Screw M3 12mm)	18p
BF38R (Pozi Screw M3 25mm)	48p
LR58N (Pozi Screw M3 40mm)	68p
BF39N (Pozi Screw M2.5 6mm)	24p
BF40T (Pozi Screw M2.5 12mm)	24p
BF41U (Pozi Screw M2 6mm)	28p

Panel-Head Metric Bolts



Nickel-plated brass panel-head screws with slotted head available in the following sizes.

M4 x 6mm	M3 x 6mm	M2.5 x 6mm
	M3 x 9mm	
M5 x 12mm	M4 x 12mm	M3 x 12mm
	M4 x 25mm	M3 x 25mm

All types supplied in packs of ten.

Continued on next page.

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Maplin SHOP
in SOUTHAMPTON
46 Bevois Valley Road. ☎0703 225831

Panel-Head Metric Bolts

Continued

Order		
BF46A	(Isobolt M5 12mm)	54p
BF48C	(Isobolt M4 6mm)	38p
BF49D	(Isobolt M4 12mm)	38p
BF50E	(Isobolt M4 25mm)	38p
BF51F	(Isobolt M3 6mm)	32p
HY30H	(Isobolt M3 9mm)	28p
BF52G	(Isobolt M3 12mm)	28p
BF53H	(Isobolt M3 25mm)	28p
BF54J	(Isobolt M2.5 6mm)	24p
BF55K	(Isobolt M2.5 12mm)	18p

Metric Full Nuts



Nickel-plated brass full nuts available in the following sizes.

M5 M4 M3 M2.5 M2

All types supplied in packs of ten.

Order		
BF56L	(Isolut M5)	20p
BF57M	(Isolut M4)	18p
BF58N	(Isolut M3)	15p
BF59P	(Isolut M2.5)	12p
LR59P	(Isolut M2)	10p

Metric Washers



Nickel-plated brass washers available in the following sizes.

M5 M4 M3 M2.5 M2

All types supplied in packs of ten.

Order		
BF60Q	(Isowasher M5)	9p
BF61R	(Isowasher M4)	9p
BF62S	(Isowasher M3)	9p
BF63T	(Isowasher M2.5)	9p
LR60Q	(Isowasher M2)	9p

Metric Shake-Proof Washers



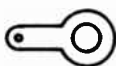
Cadmium-plated and passivated steel shake-proof washers available in the following sizes.

M5 M4 M3 M2.5 M2

All types supplied in packs of ten.

Order		
BF42V	(Isoshake M5)	9p
BF43W	(Isoshake M4)	9p
BF44X	(Isoshake M3)	9p
BF45Y	(Isoshake M2.5)	9p
LR61R	(Isoshake M2)	9p

Metric Solder Tags



Heavily tinned steel solder tags available in the following sizes.

M4 M3

Both types supplied in packs of ten.

Order		
LR63T	(Isotag M4)	18p
LR64U	(Isotag M3)	18p

Self-Tapping Screws



Steel self-tapping screws available in the following sizes.

No.2 x 3/16in. No.2 x 3/8in.
No.4 x 3/16in. No.4 x 3/8in. No.4 x 1/2in. No.6 x 3/8in.
No.6 x 1/2in. No.8 x 1/2in. No.8 x 3/8in.

All types supplied in packs of ten.

Order		
BF68Y	(Sif-Tpr No.8 x 3/8in)	15p
BF69A	(Sif-Tpr No.8 x 1/2in)	15p
LR67X	(Sif-Tpr No.6 x 3/8in)	15p
BF67X	(Sif-Tpr No.6 x 1/2in)	15p
BF65V	(Sif-Tpr No.4 x 3/8in)	15p
BF66W	(Sif-Tpr No.4 x 1/2in)	16p
BF64U	(Sif-Tpr No.2 x 3/16")	15p
LR68Y	(Sif-Tpr No.2 x 3/8in)	15p

Nylon BA Bolts



An ivory finish nylon cheese-head bolt available in the following sizes.

2BA x 1/2in. 4BA x 1/2in. 6BA x 1/2in. 8BA x 1/2in.
2BA x 1in. 4BA x 1in. 6BA x 1in.

All types supplied in packs of ten.

Order		
BF70M	(Nyl 2BA 1/2in.)	78p
BF71N	(Nyl 2BA 1in.)	78p
BF72P	(Nyl 4BA 1/2in)	64p
BF73Q	(Nyl 4BA 1in.)	58p
BF75S	(Nyl 6BA 1/2in.)	48p
BF76H	(Nyl 6BA 1in.)	68p
BF77J	(Nyl 8BA 1/2in.)	£1.48

Nylon BA Nuts



Ivory finish nylon nuts available in the following sizes.

2BA 4BA 6BA 8BA

All types supplied in packs of ten.

Order		
BF78K	(Nyl Nut 2BA)	48p
BF79L	(Nyl Nut 4BA)	58p
BF80B	(Nyl Nut 6BA)	58p
BF81C	(Nyl Nut 8BA)	58p

Nylon BA Washers



Ivory finish nylon washers available in the following sizes.

2BA 4BA 6BA 8BA

All types supplied in packs of ten.

Order		
BF82D	(Nyl Washer 2BA)	15p
BF83E	(Nyl Washer 4BA)	15p
BF84F	(Nyl Washer 6BA)	18p
BF85G	(Nyl Washer 8BA)	28p

Nylon Metric Nut and Bolt

An ivory finish metric-thread nylon nut and bolt. Supplied individually. M3 x 12mm countersunk bolt M3 full nut.

Order		
WH18U	(Nyl C/S Bolt M3x12mm)	6p
WH19V	(Nylon Nut M3)	4p

SPRING CLIP

A black finish 4BA panel-fixing spring clip for use where it would be impractical or impossible to hold a nut still while turning the screw. Sold singly.



Order		
BF15R	(Spring Clip)	5p

JAPANNED WOODSCREW

A No.4 x 1in. black japanned woodscrew with a slotted round head. Supplied in packs of ten.

Order		
LB99H	(Blk Wdscrw No 4 1/2")	18p

SCREW SIZES

The size of a metric screw is defined by the numbers M5, M4, M3, M2.5 etc, where the number after the M is the overall diameter of the thread in mm., and by the length in mm.

6mm = 1/4in. approx, 9mm = 3/8in. approx,
12mm = 1/2in. approx and 40mm = 1 1/2in. approx.

For comparison the overall diameter of the thread in BA sizes is as follows:

8BA = 2.25mm, 6BA = 2.85mm, 4BA = 3.68mm,
2BA = 4.78mm, 0BA = 6.12mm.

In No. screws:

No.8 = 4.25mm, No.6 = 3.6mm, No.4 = 3.0mm,
No.2 = 2.25mm.

HANDWHEEL BOLT



A handwheel bolt ideal for fixing portable frames or legs etc. Matt black knob with 35mm long bolt is supplied with T-nut internally threaded to fit bolt. Nut requires a 10mm hole in the woodwork and spikes pull into wood when bolt first tightened to ensure secure fixing. Knob diameter: 45mm. Knob height: 14mm.

Order		
YL23A	(Hand Wheel Bolt)	24p

SPADE TERMINALS

Spade terminals available in sizes 2BA and 4BA. Supplied in packs of ten.



Order		
FW10L	(Spade 2BA)	30p
FW11M	(Spade 4BA)	28p

BRASS STUDDING

A 6in. length of screwed brass rod. Available in 2BA, 4BA and 6BA.



Order		
FW13P	(Studding 2BA)	35p
FW14Q	(Studding 4BA)	38p
FW15R	(Studding 6BA)	40p

SPACERS Clearance



Circuit board mounting spacers. 4BA, 6BA, M3 or M4 clearance nickel-plated brass tubes. Available in the following sizes.

4BA x 1/8in. 6BA x 1/8in.
4BA x 1/4in. 6BA x 1/4in.
4BA x 1/2in. 6BA x 1/2in.

M3 x 1/8in.
M4 x 1/4in. M3 x 1/4in.
M4 x 1/2in. M3 x 1/2in.

Supplied in packs of ten.

Order		
FW30H	(4BA Spacer 1/8in.)	50p
FW31J	(4BA Spacer 1/4in.)	54p
FW32K	(4BA Spacer 1/2in.)	58p
FW33L	(6BA Spacer 1/8in.)	44p
FW34M	(6BA Spacer 1/4in.)	48p
FW35Q	(6BA Spacer 1/2in.)	58p
FG32K	(M3 Spacer 1/8in.)	50p
FG33L	(M3 Spacer 1/4in.)	54p
FG34M	(M3 Spacer 1/2in.)	58p
FG36P	(M4 Spacer 1/4in.)	58p
FG37S	(M4 Spacer 1/2in.)	64p

Threaded



Nickel-plated brass spacers with the centre hole tapped to accept a 4BA, 6BA, M3 or M4 screw. Length of the 4BA and 6BA types is 1/2in, the M3 and M4 types is 14mm. Overall diameter of 4BA, 6BA and M4 is 6.35mm (1/4in.) and M3 is 4.75mm.

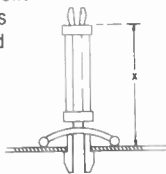
Supplied in packs of ten.

Order		
LR71N	(Threaded Spacer 4BA)	89p
LR72P	(Threaded Spacer 6BA)	68p
FG38R	(Threaded Spacer M3)	89p
FG39N	(Threaded Spacer M4)	98p

STAND-OFFS



A range of plastic snap-in stand-offs which eliminate the need for nuts and bolts when mounting printed circuit boards etc. The bottom snaps permanently into a chassis hole 5mm (0.2in) dia. in any chassis with a thickness 1.5mm to 2.5mm. The top snaps into a 4mm (0.15in) dia. hole in the circuit board which can be removed and re-fitted as required. These stand-offs provide mechanically secure, insulated mounting, yet boards can be quickly removed.



Type	Dimension X	Overall length
Short	6mm (0.2in)	15mm (0.6in)
Medium	15mm (0.6in)	24mm (0.9in)
Long	19mm (0.75in)	28mm (1.1in)

Order

FW16S	(Standoff Short)	8p
FW17T	(Standoff Medium)	8p
FW18U	(Standoff Long)	8p

TERRY CLIPS



Available in 1/2in. and 1 1/2in. dia.

Order

LR03D	(Terry Clip 1/2in.)	12p
LR73Q	(Terry Clip 1 1/2in.)	20p

GROMMETS Small Grommet



PVC grommets, bore 1/4in. dia.; chassis hole 3/8in. dia.

Order

FW59P	(Grommet Small)	2p
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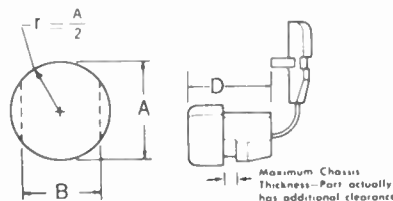
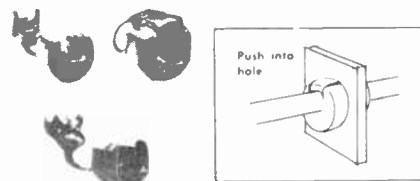
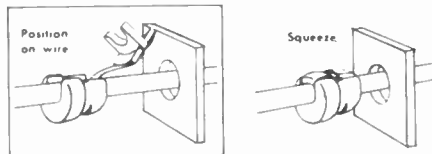
Large Grommet

PVC grommets, bore 3/8in. dia.; chassis hole 1/2in. dia.

Order

FW60Q	(Grommet Large)	2p
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Strain Relief Grommets



A range of moulded black nylon strain-relief grommets which eliminate the need for knot tying, screw-down cable clamps etc. Simply place cable in grommet, squeeze closed and snap into chassis cut-out. Four sizes are available.

Type	To fit cable	B to stop (mm)	A twisting (mm)	Max ch'ssis (mm) thickness (mm)	D
3P-4	Twin mains DS	9.7	11.0	1.6	10.3
5M-3	Min Mains	11.0	11.7	2.5	11.1
6W-1	C6A Mains/ Cotton Mains	11.5	12.2	2.3	11.1
7K-2	HD Mains/ 4-Core Mains	13.7	15.5	3.2	14.7

Supplied individually

Order

LR47B	(SR Grommet 3P-4)	8p
LR48C	(SR Grommet 5M-3)	10p
LR49D	(SR Grommet 6W-1)	15p
LR50E	(SR Grommet 7K-2)	28p

Cable Sealing Grommet

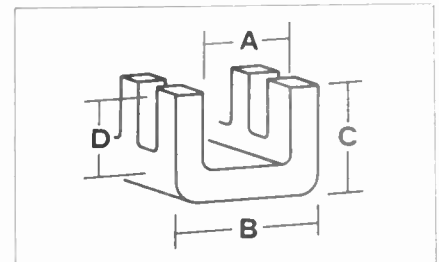
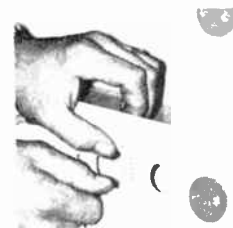


A black moulded PVC grommet that provides a seal around cables from 5mm to 10mm dia. Chassis hole size: 16mm (5/8in.). Max chassis thickness: 1.6mm (1/16in., 16 swg)

Order

LR51F	(Sealing Grommet)	8p
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Flexible Grommet Strip



A unique continuous grommet strip ideal for all shapes and sizes of holes in panels. Easily cut with scissors and fitted without the aid of tools or adhesives, it can be used on any type of panel material. Available in white polythene in three sizes:

Size	Dimensions (mm)			
	A	B	C	D
A	1.4	3.8	4.0	2.5
B	2.3	4.5	4.0	2.5
C	3.3	5.6	4.0	2.5

Size	For panel thickness	
	mm	swg
A	0.4 to 1.3	27 to 18
B	1.3 to 2.1	16 and 14
C	2.1 to 3.3	12 and 10

Sold per metre (max length in one piece 25m).

Order

BL74R	(Flexigrommet A)	28p
BL75S	(Flexigrommet B)	30p
BL76H	(Flexigrommet C)	32p

PVC BEADING

A flexible, black PVC beading of slotted section intended to provide a protective edging to metal panels, chassis and covers etc, will also protect persons coming into contact with metal edges, for example. May have to be glued in position if firm fixing is required.

Sold per metre.

Order

XR78K	(PVC Beading Section)	24p
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PHONE NOW
0702 552911



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

HOLE PLUGS



Moulded nylon plugs which snap-lock with finger pressure into holes in chassis which are to be blanked off. Two sizes are available. Colour: black.

Type	Fits hole dia.	Head dia.	Overall height	Max chassis thickness
1/4in.	6.35mm	7.94mm	1.57mm	
3/8in.	9.53mm	11.91mm	10.32mm	3.18mm

Order

FW36P (Hole Plug 1/4in.)	8p
FW37S (Hole Plug 3/8in.)	10p

SELF-ADHESIVE PADS

A small foam pad 25 x 12mm (1mm thick) with a strong adhesive coating on both sides. Adhesive will bond to most materials. Supplied in strips of ten pads.

Order

HB22Y (Quickstick Pads)	10p
-------------------------	-----

VELCROMOUNTS

A versatile self-adhesive mounting and fixing system. Supplied in pairs of pads: one blue and one white. Simply stick the white pad to the nonmovable side and the blue pad to the object to be fixed to it, e.g. in speaker cabinets the pads are an ideal method of securing the grille in front loading systems and in this case the blue pad would be fixed to the grille and the white pad to the cabinet. When the two pads are pressed together lightly they form an immediate positive bond. To replace or interchange the object simply pull the pads apart; the white pad remains in place for further use and the blue pad stays on the removed object. They may continue to be used indefinitely.

Order

HB21X (Velcromounts)	15p
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SEALING STRIP

A soft foam strip with a strong, long-lasting pressure sensitive adhesive on one side. Suitable for use as draught excluder, dust seal or air seal e.g. in loudspeaker cabinets. Sold in 3.3m lengths.

Order

LQ12N (Sealing Strip)	80p
-----------------------	-----

ALUMINIUM SHEET



Aluminium sheet having one side coated with a protective polythene layer to prevent scratching.

Two sizes are available:

18swg	295 x 195mm (12 x 8in)
16swg	490 x 295mm (20 x 12in)

Order

LH12N (Ally Sheet 18 swg)	£1.95
LH13P (Ally Sheet 16 swg)	£3.95

MAINS WARNING LABEL

A self-adhesive label bearing the legend "WARNING Mains Voltage" printed in red on a silver background. Size 45 x 18mm.

Order

WH48C (Mains Warning Label)	20p
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PCB GUIDE



A moulded nylon support and guide for vertically mounted pcb's. Guide is push fixed and requires an 8 x 4mm mounting slot. Overall height: 39mm, width: 8mm, thickness: 4.5mm. The guide has a slot for a pcb on each side and both slots are 3mm deep.

Order

XX31J (PCB Guide)	28p
-------------------	-----

TRANSFERS

Graphic Transfers



A range of rub-down letters and numbers which utilise a novel system so that letters are automatically on a straight line and correctly spaced making them extremely quick and simple to use. A truly professional finish can be achieved with this remarkable system.

Two sizes are available. Letter height 1/8in. and 1/4in. Each sheet contains lower case letters, capitals and numerals as well as full stops and commas. Both types are available in black, white and red. Sheet size: 12in x 9in.

Order

XH39N (Transfer 1/8in Black)	£1.50
XH40T (Transfer 1/8in Red)	£1.50
XH41U (Transfer 1/8in White)	£1.50
XH42V (Transfer 1/4in Black)	£1.50
XH43W (Transfer 1/4in Red)	£1.50
XH44X (Transfer 1/4in White)	£1.50

Panel Transfers

A sheet of words, symbols and numerals commonly used on front and rear panels of hi-fi and electronic equipment. Letter height is 2.5mm. Words etc. rub-down onto panel. Available in Black, Red or White.

Order

XH45Y (Panel Transfer Black)	£1.50
XH46A (Panel Transfer Red)	£1.50
XH47B (Panel Transfer White)	£1.50

SNAP RIVETS

Small plastic rivets which may be used as a quick and cheap alternative to screws and nuts for holding together panels, pcb's onto brackets and chassis etc, providing the fixture is reasonably permanent. They are used in the assembly of our ZX81 and Spectrum keyboard kits, for example. The rivets are in two parts, a headed pin which pushes through holes in the items to be attached, and a sleeve which pushes and locks onto the pin and holds the joint together. Requires 2mm minimum hole diameter.

Supplied in packs of ten.

Order

BK87U (Snap Rivet)	5p
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HEATHKIT

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THE HEATHKIT RANGE

A range of superbly documented kits and educational courses from the world's most famous name in electronic kits: Heathkit. Each kit contains a tell-all guide for first-time builders, a highly detailed step-by-step assembly manual and all the components and hardware you need. Every component from the lowliest resistor to the most complex IC is thoroughly tested at the Heath factory in America prior to inclusion in the kit.

Although one or two of the products shown in the following pages are ready-made products, unless specifically stated all items are supplied in kit form. Buy your Heathkit products from Maplin and if you should get into difficulties with your kit you can take advantage of our repairs and get-you-working service — see page 19.



HEATHKIT AMERICAN CATALOGUE

A limited supply of the Heathkit American catalogue showing their full line of products is available from Maplin. The catalogue is published at irregular intervals and the latest edition will be sent. The catalogue contains 104 pages, many in full colour. The charge shown covers our import costs and carriage.

Order

HK00A (Heathkit Catalogue) 85pNV

AMATEUR RADIO KITS

Synthesised HF SSB/CW Transceiver HW-5400



- Choose the world's most fascinating radio kit and experience performance others only dream of
- PLL-synthesised stability with crystal accuracy
- Unique dual-speed tuning knob with 50Hz resolution
- Digital display with direct keyboard frequency entry, two memories per band and mode/status symbols

The world's first and only kit form synthesised HF Transceiver.

For every ham who dreams of owning the finest quality, multi-purpose equipment they can get their hands on, Heath has created a special new assemble-it-yourself rig. The compact HW-5400 Synthesised Transceiver is a marvel of modern kit-form engineering design. Controlled and monitored by a custom 8-bit microprocessor, it yields quick-change versatility in adapting to uncertain band conditions. From the moment it arrives, you start an interfacing experience that will put the original sense of thrill, skill and adventure back into Amateur Radio.

Three modes, eight bands and plenty of power for HF excitement.

The HW-5400 operates in USB, LSB and CW on 80-10 meters with automatic sideband selection. Completely solid-state and broadband, it has full break-in (QSK) for proficient CW ops, sixteen memories, power supply activation at the transceiver panel, defeatable amplifier relay for quiet keying, maximum shielding on the PA, reverse and over-voltage protection as well as high VSWR forward power cutback circuitry for the cool-running finals.

The HW-5400's high resolution tuning system.

Employs a dual-speed technique so uniquely practical and efficient, Heath has applied for patent rights. An infra-red optical shaft encoder and two rotation holes control the scan speed. One uses a capacitive-touch metallic insert so you can rapidly scan a band in 1KHz increments, while tuning with the other lets you pick out closely-packed calls for more QSO's over a narrow frequency range at 50Hz per step.

Beats the QRM every time.

A tremendously versatile Split Memory Access function lets you review and change the transmit frequency while in receive without missing a single word or fragment of code from the station in contact.

Total Transceiver status at a glance.

Seven mode and function symbols left of the frequency display inform you of current mode, TR status, split operation, split memory access handling, and

whether the transmit frequency is outside the band edge. They can be set to one of three brightness levels.

Half the controls on most transceivers, twice the performance of many.

The HW-5400 front panel is clean and uncluttered, with all functions marked for easy operation. Three dual-concentric knobs command every aspect of signal isolation and maintenance. Essential vox and sidetone controls are located behind the nameplate, which flips open at a touch.

More microprocessor ingenuity.

With the inexpensive HWA-5400-3 Keypad option wired on, you've got extra pushbutton power and signal-capturing advantage. It allows instantly synthesised direct QSY to any position in the band, and permits fast DX, contest and network when using the Split Memory function. The cursor-controlled single-digit random or sequential access to any frequency and 50Hz PLL accuracy improves contact agility.

Matched to this Transceiver.

The HWA-5400-1 Power Supply/Speaker/Digital Clock provides a well regulated 13.8 volt source of DC power.

Add on Crystal filter optimises receiver performance.

A deluxe 2.1KHz, 4-pole SSB crystal filter provides a sharper skirt selectivity in the i.f. bandpass and gives ten total poles of filtering and optimum receiver performance.

SPECIFICATIONS:

GENERAL: Overall Band Coverage: 80 through 10 meters, 10 MHz WWV; WARC bands operational. Frequency Coverage: 3.450-4.050, 6.950-7.350, 10.000-12.200, 13.950-14.400, 18.018-18.218, 20.950-21.500, 24.840-25.040, 28.00-29.750 MHz. Frequency readout: 7 digit vacuum fluorescent display with special symbols. Readout Symbols: - (Split), — (Out of band), L (LSB), U(USB), C (CW Narrow), M (Memory), T (Transmit). Readout accuracy: To nearest 50Hz. Frequency Control: Synthesised. Synthesised Lock Indicators: Display reads 'PLL' and LED's show which loops are unlocked. Transmitter is disabled. Dual Rate Frequency Tuning: Slow: 50Hz per step, 1.25kHz per knob rotation. Fast: 1kHz per step, 25kHz per knob rotation. Tuning Backlash: None. Split Frequency Rotation: Transmit from memory frequency, receive from displayed frequency. Memory: Store two frequencies per band. Frequency Stability: Less than 50 PPM drift from turn on. Modes: SSB, Normal and Reverse; CW, Wide or Narrow.

★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

Operating Temperature: 0° to 40°C. Power Requirements: 11 to 16V DC, 120 240V AC with optional AC power supply. All specifications referenced to 13.8V DC. RECEIVER: Sensitivity: Less than 0.35µV for 10dB, S+N/N. Selectivity: With standard filter, 2.0kHz minimum at 6dB to 6kHz maximum at 60dB; With HWA-5400-2 optional filter, 1.8kHz minimum at 6dB; CW active audio filter, 250 Hz minimum at 6dB centred at 700 Hz. Overall Gain: Less than 1µV for 0.25 watt audio output. Audio Output: 2 watts minimum into 4 ohms; less than 10% THD. AGC: Selectable fast or slow (no more than 8dB audio change for a 100dB or greater input signal range). Intermodulation Distortion: 70dB minimum at 25kHz. Image Rejection: 80dB minimum. IF Rejection: 100dB minimum. IF Shift Tuning: ± 600 Hz in Receive only. Internally Generated Spurious Noise: All below 1.0µV. Audio Hum and Noise: Greater than 40dB below maximum output. Receiver Incremental Tuning: ± 350Hz. TRANSMITTER: RF Output: High SSB, 100 watts PEP power minimum, except 80 watts on 10 metres, CW, 100 watts minimum, except 80 watts on 10 metres. Duty Cycle: Continuous SSB (voice), 50% receive-transmit ratio on CW; 5 min on 5 min off. Load Impedance: At least 90% rated power with less than 2:1 SWR. Protected against high VSWR. Carrier Suppression: -50dB minimum from a 100 watt, single tone (1000 Hz). Unwanted Sideband Suppression: -50dB minimum from a 100 watt, single tone (1000 Hz). Spurious Radiation: -60 dB minimum referenced to 100 watt output. Third Order Distortion: -30dB minimum from a 100 watt PEP two-tone output. T/R Operation: SSB = PTT or VOX, CW = full break in (simplex only). CW Sidetone: 700 Hz to speaker or headphones. Microphone Input: High Impedance (25k ohm) with -55dBm rating. Operation with External Line Amplifier: Linear relay, linear ALC rear panel connections. Front Panel Meter: Automatically switched S-units in Receive, ALC in Transmit. Available Accessories: HWA-5400-1 AC Power Supply with 12 24 hour clock and speaker: HWA-5400-2 2.1kHz SSB filter; HWA-5400-3 Frequency Entry Keypad Kit. Cabinet: 10.8 x 28.6 x 35.6cm.

HWA-5400-1 SPECIFICATIONS:

Line Voltage: 120 240V AC, 50/60 Hz. Output Voltage: 3.8V DC at rated load. Protection: 20 amperes DC output fuse, 7 and 4 ampere slow blow fuses for 120 and 240V AC primaries respectively. Output Current: As required by Transceiver, up to 18 (20 Peak) amperes during transmit. DC Coupled Regulation: 7% from receiver load to transmit load at 120V AC primary; 4% additional with AC primary at 110-130 or 220-260V AC. Ripple: 50mV or less at rated load. Duty Cycle: 9 amperes DC continuous, 18 amperes at 50% (5 min on 5 off). Speaker: 4 ohms impedance, 3000Hz response, 2 watts peak power. Clock: 4-digit blue fluorescent display in 12 or 24 hour format, synchronised to line frequency. Cabinet Dimensions: 10.8 x 21.6 x 35.6cm.

As you build the 5400 kits

Circuit by circuit you'll learn their engineering details with hands-on understanding. The fully illustrated, step-by-step manual guides you all the way through assembly. With the knowledge you gain to keep it performing at peak efficiency, the HW-5400 is the only rig to make real the dream of every amateur — a greater, more worthwhile return in pleasurable, year-to-year results on a premium investment. The new HW5400. If you've got the time, this is *the* transceiver.

Order

HK61R (HW - 5400 Syn HF Xcvr)	£499.95
HK62S (HWA - 5400-1 PSU/Clk)	£179.95
HK63T (HWA - 5400-3 Keypad)	£59.95
HK66W (HWA - 5400-2 Filter)	£59.95

SSB/CW/RTTY Active Audio Filter HD-1418



- Lowpass, highpass, peak and notch controls help user customize upper and power bandpass edges to isolate desirable signals and reject heavy QRM

As today's bands become increasingly crowded.

There's often a problem with too much interference to bother trying to copy a good signal. Heathkit has an easy answer to effective elimination of dogged interference — the HD-1418 Tunable Active Audio Filter.

146

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

Optimized for CW, SSB and RTTY reception under the worst possible conditions, it tunes out unwanted QRM like magic and improves the selectivity of receivers by a remarkable degree.

Twelve total poles of filtering.

Can be combined to work as SSB & Notch, CW, CW2, SSB, SSB and Peak, RTTY and Fixed Configurations with razor-sharp skirts. By giving full control over receiver bandpass characteristics, it can solve such problems as partially overlapping sideband signals, overmodulation splatter, close packed CW stations, full RTTY reception through heavy interference, heterodyne whistles and noise that other filters find impossible to conquer. Simple to install — just plug it in series between receiver output and speaker. Filter is bypassed when off. Input overload LED glows if signal exceeds 3 volts, so you can adjust output gain for undistorted response.

SPECIFICATIONS:

High Pass Filter: 5-pole tunable elliptical, with 300-500 Hz range at -6dB. Low Pass: 5 pole tunable elliptical 300-3500 Hz range at -6dB. Notch/Peak Filter: 2-pole tunable; 300-3500 Hz width at 6dB; 30dB depth. Input Impedance: Hi-Z 5kΩ minimum. Nominal Gain: Unity. Audio Amplifier Output: 1.0 watt into 4Ω. Input/output Connections: 1" audio phone jack; "Tape Out" at -20dB, "Input" and "Output" RCA phono jacks; DC power connector. Power Requirements: 7-13V AC or 9-18V DC 25-400mA. Optional Power Supply: PS5024. Dimensions 4.8 x 22.5 x 16.8cm.

Order

HK73Q (HD-1418 Active Filtr)	£99.95
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Deluxe QRP CW Transceiver HW-9



- Broadband circuits cover 250kHz of CW in the 80, 40, 20 and 15m bands.
- Expandable to cover 30, 17, 12 and 10m bands with optional Accessory Band Pack.
- Solid-state T/R switching allows for full break-in.
- Front panel relative signal/power strength meter.
- Continuously variable RF output.
- Receiver incremental tuning.
- Wide or narrow audio active filter.

The Low Power Challenge

Join the challenge of low power QRP in the world of five watts and below. The all new Heathkit HW-9 transceiver sets the standard for comparison in wide dynamic range performance. Rugged and light-weight, the HW-9 is ideal for portable operation. This QRP transceiver can be powered from 12V batteries, from the car lighter socket, or by our XG10L power supply.

Operator Convenience

The HW-9 covers the 3.5-3.75, 7.0-7.25, 14.0-14.25 and 21.0-21.25MHz operating ranges. Install the HWA-9 Accessory Band Pack and expand the coverage to include the WARC bands at 10.1-10.15, 18.068-18.168, 24.89-24.99 and 28.0-28.25MHz. Can be used with headphones or a loudspeaker.

Totally New Design

The design of the transmitter and receiver sections uses state-of-the-art techniques providing features and a level of performance unexpected at this price. These features include broadband design, wide dynamic range, AGC, single conversion, balanced product detector, active audio processing and RIT.

Main Features

The broadband design eliminates the need to tune circuits within a band. The wideband front end has a double balanced mixer and 4-pole crystal filter to handle wide dynamic range signals with ease and eliminate the customary RF amplifier in the receiver section. Automatic Gain Control circuits provide superior receiver performance with good audio response. A single conversion in the main signal path reduces spurious responses and maintains superior image rejection. Signals are pulled through the sensitive front end with ease. A balanced product detector followed by active audio processing provides for an outstanding performance. Receiver Incremental Tuning (RIT) permits the tuning of the receiver 1kHz above or below the transmit frequency. Few other QRP CW transceivers offer as many features.

Kitbuilding Fun

As usual the Heathkit manual takes you through detailed instructions during assembly and final alignment procedures. A multimeter, frequency counter and a dummy load are required.

SPECIFICATIONS

TRANSMITTER: RF Output Power: 4W (3W on 10m). Transmitter frequency offset: approx 700Hz. Antenna load impedance: at least 90% of rated power with less than 2:1 SWR. Protected against high SWR. Harmonic and Spurious and Radiation: -35dB and -40dB minimum at rated output. T.R operation: CW, full break-in. **RECEIVER:** Sensitivity: 0.2µV for readable signal; 0.5µV or less for 10dB S+N/N. Selectivity: Wide, 1kHz max @ 6dB; Narrow, 250Hz @ 6dB. Dynamic range: 85dB. Image and IF rejection: 60dB min. Audio hum & noise: -60dB. Audio output: 1W into 8Ω. **GENERAL:** Frequency stability: less than 150Hz/hour drift after 30 minute warm-up. Power requirements: 11-16V DC, 12.6V specified. Dimensions: 108 x 235 x 216mm.

Order

HS63T (Heathkit HW-9)	£199.95
HS64U (Heathkit HWA-9)	£29.95

General Coverage Receiver SW-7800

- Five-digit LED display provides 1kHz frequency accuracy
- Lower Sideband, Upper Sideband, CW and AM (wide and narrow) modes of operation
- Excellent sensitivity and selectivity for clean signals
- Portable capability coupled with lower power consumption



The SW-7800 General Coverage Receiver covers 150kHz through 30MHz

And it does it continuously in 30 over-lapping, 1MHz bands. Broadband front-end circuits eliminate the need to tune circuits within a band. The design of the wide-band front-end stages eliminates the need for the customary RF amplifier. This results in a receiver that can properly handle incoming signals within a wide dynamic range. An up-converting, double-conversion mixing design is used to provide excellent image rejection. Plus other features you'll appreciate: AGC time-constant switch. Muting provision to allow operation with a transmitter. Local/DX switch to protect against overload from very strong local stations. Front panel jack for taping received material - unaffected by volume control setting. Telescoping whip antenna for local reception and portable operation. Only a VTVM is required for receiver alignment. This unit operates on a 12V DC ¾A supply. A suitable power supply is XG10L (see Communications Section). The mains input is 120V only and must not be connected to UK mains.

High-performance trapped dipole antenna

An optional accessory for this or any general coverage or shortwave receiver. Eight high-Q parallel-tuned traps reduce length and isolate various segments of the antenna for full coverage of the 11, 13, 16, 19, 25, 31, 41, 49 and 60 metre bands.

Specifications:

General: Frequency Coverage: 150kHz to 30MHz in thirty 1MHz ranges. Frequency Readout: LED's, 5-digit. Readout Accuracy: Nearest 1kHz. Frequency Control: Synthesized (PLL and LC VFO). Modes: USB, LSB, CW and AM (wide or narrow). Sensitivity: SSB/CW, less than .35µV for 10dB (S + N)/N; AM, less than 2.5µV for 10dB (S + N)/N. Selectivity: SSB/CW, 2.5kHz min. at 6dB; AM, 5.5kHz min. at 6dB. Selectivity Shape Factor: 1.5 at 6/50dB. Image Rejection: 55dB min. **Other:** Antenna: Built-in telescoping whip. Connection for 50 ohm, unbalanced,

external antenna (SO239) and high-impedance wire. Audio Output: Internal speaker, jack for headphone or external speaker. Muting: External jack for use with transmitter. Recorder Output: Miniature phone jack. Power Requirements: 120V AC, internally; 13.8V DC at ¾-ampere, externally. Dimensions: 29.2 x 26.7 x 11.75cm.

Order

HT27E (Heathkit SW-7800)	£349.95
HT28F (Heathkit HDP-7800)	£59.95

40-Channel Scanning Radio GR-740



- The GR-740 scans 40 programmable channels across seven bands, at the touch of one or two buttons
- Microprocessor control and direct keyboard tuning on all seven VHF/UHF bands.
- Only kit scanner to cover aircraft, marine and public service bands, all in one unit

Seven band UHF/VHF coverage

Puts a wide variety of radio services at your finger-tips. Receive amateurs, police, government, forestry, mobile telephones, press, fire, aircraft, air traffic control, marine, utility services, business and industrial communications, and disaster relief. Scan 40 preselected frequencies or search between two frequencies on a band. Automatic squelch is factory-set for optimum reception; includes operator override.

Versatile 24-key keyboard

Divided into program and operation sections for rapid and easy use. Program any frequency within the seven bands covered into the two banks of 20 channels each. Operate by setting and controlling automatic scan and manual select, bank select, direct channel access, service search, search and scan speeds, search start/hold, priority channel, upper/lower frequency search limits and program and delay or lockout of any frequency. Direct channel access permits instant tuning of a channel without stepping through interim channels. Or press one button to step through an entire 20-channel bank.

Microprocessor control also adds other convenient features.

Some of these are: priority channel sampling every two seconds, with interrupt when a signal is detected; patented track tuning, for automatic, optimum reception across the full band without adjustment; full-featured display, to let you know how you've programmed your scanner and what it is doing; scan delay, for channels where replies are expected; and there is much more. Factory assembled, aligned and tested circuit boards ensure optimum performance. Only minor adjustments are made when assembling this kit. This unit operates on a 12V DC ¾A supply. A suitable power supply is XG10L (see Communications Section). The mains input is 120V only and must not be connected to UK mains.

Specifications:

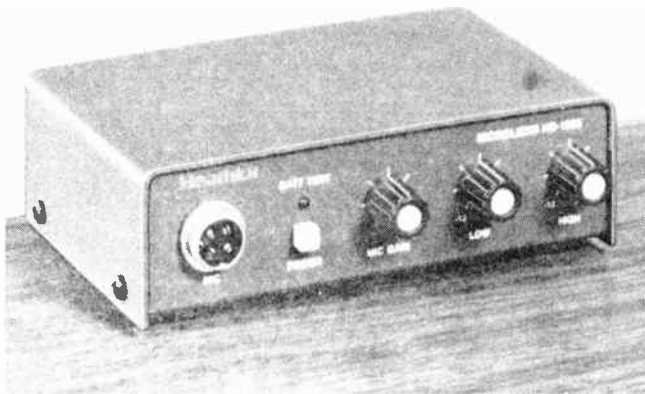
Frequency Coverage: Low band (30-50MHz), aircraft (118-136MHz), 2 metre Amateur (144-148MHz), High band (148-174MHz), 70cm Amateur (421-450MHz), UHF band (450-470MHz), UHF-T band (470.0125-512.45MHz). RF Sensitivity: 0.4µV (30-50, 144-147MHz) and 0.8µV (421-512MHz), ±5kHz deviation 12dB SINAD; Aircraft, 1µV for 10dB S/N, 60% modulation. IF Selectivity: -55dB @ 25kHz. Scan/Search Speed: 5 or 15 channels per second. Audio Output: 0.75 watt RMS into 8-ohm load, 10% THD. Front Panel: Volume (on/off), squelch, display, keyboard, speaker, position A/B. Rear Panel: 13.8V DC input, antenna connector, speaker connector, 120V AC receptacle. Antenna: Telescoping, 50 to 70-ohm external connector. Power Requirement: 120V AC, 50/60Hz @ 20 watts; or 13.8V DC @ 9 watts. Dimensions: 27 x 20.3 x 8.9cm.

Order

HT29G (Heathkit GR-740)	£249.95
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★ All prices include VAT ★ Price charged will be that current on the day of despatch. See prices on page 15.

Microlizer HD-1986



- Obtain maximum SSB output with clearer sounding signal
- Variable high and low response and audio gain permit adjusting for differences between microphone and transmitter
- Tailor your voice for maximum clarity when transmitting
- Easy-to-build Amateur Radio starter kit

One of the greatest needs in amateur radio

That is to improve the quality of transmitted speech. In the shack, a poor microphone or just the pitch of a speaker's voice can make SSB transmissions difficult to understand. And in mobile operation, peaks at the lower end of the voice range are common and frequently obscure clarity.

Optimize the clarity of your voice

The Heathkit HD-1986 Microlizer lets you optimize the clarity of your voice transmissions and get a better match between your microphone and transceiver. Make sure you're heard - clearly. This microphone equalizer fits in series with your microphone and transceiver, using a standard 4-pin microphone jack and 1/4" phone output jack. Continuously variable high and low frequency controls provide a ± 12 dB (boost or cut) at 490Hz and 2800Hz. Increase or decrease overall gain of the microphone signal you feed to your transceiver for more efficient and cleaner operation.

Battery power and low-profile design

Eliminates the need of yet another AC outlet. When the Microlizer is turned on, the front panel LED will light briefly to let you know the battery is still good. Turn the power switch to off, and the Microlizer is bypassed to provide a direct connection between your microphone and transceiver. Low-profile design and small size make it easy to add the HD-1986 Microlizer to your present amateur gear.

Attractive, charcoal styling blends in with almost any equipment. The Microlizer is an economical addition to your shack that will provide dramatic improvement in your transmitted audio.

One-evening assembly

Heathkit's comprehensive instruction manual leads you every step of the way through assembly. Requires a 9-volt battery (not included).

Specifications:

Adjustable Microphone Gain: Low Frequency Response: ± 12 dB at 490Hz; High Frequency Response: ± 12 dB at 2800Hz. Input Impedance: 100k nominal. Maximum Input Level: 500mV RMS. Frequency Response: 200Hz to 10kHz. Distortion: 5% or less. Power Requirement: 9-volt transistor battery. Dimensions: 14.6 x 10.8 x 5.1cm.

Order

HT30H (Heathkit HD-1986) £39.95

Cantenna Load Resistor HN-31A

We've made the original "Cantenna" even better. This important device now has improved specifications, better components and our famous low, build it yourself kit price. HN-31A now handles 1kW of RF energy (2 kW PEP) with VSWR's always less than 1.5:1 for frequencies up to 450MHz. Stabilised ceramic resistor element provides ideal 50 ohm non-inductive load to your setup. Power derating curves and spring loaded lid vent maintain high safety factor. Works like magic to eliminate unnecessary QRM during tune-up and minimise mistakes while performing 'hot' gear maintenance or alignment. Light enough for easy field portability. Holds one gallon of transformer oil (not supplied). Should be standard equipment in every hamshack. Save your finals!



Order

HK24B (HN-31A Cantenna Load) £19.95

HF/VHF Wattmeter and SWR Bridge HM-9



- For the world under 50 watts, Heath makes reliability and versatility affordable in a compact, low-power wattmeter
- Components included to wire it for three frequency ranges

Put your best QRP signal on the air with confidence

Also keep your low-watt station at peak-power efficiency with the sensitive Heathkit HM-9 Wattmeter. It simplifies, continuous metering of exciter or amplified output level and allows quick, exact matching when you fine tune your antenna system.

Versatility is extended

With an option of wiring the HM-9 for use in any one of three ranges: 1.8-30MHz, 50-54MHz or 144-148MHz, QRP fans will love it. Active hams on the 2 and 6 metre VHF bands can use it to measure output of their barefoot and boosted HT's, mobile or base station transceivers.

The HM-9 circuitry

Is contained on a single p.c. board utilizing close-tolerance components. Assembly and calibration can be completed in a single, satisfying evening. And the manual includes detailed sections on Operation, Application and Physical placement for absolutely accurate results. With build-it yourself quality throughout, QRP loyalists won't find a better Wattmeter than the compact HM-9 for monitoring output power at a glance!

Order

HK74R (HM-9 HF/VHF Wattmeter) £39.95

50W Antenna Tuner with 4:1 Balun HFT-9

- Ideal for QRP station operators who want a perfect match
- Designed with rugged portability and repeated dependability in mind, using only the finest high-quality components

When you're running a signal that peaks at less than 50 watts

There's no room for a mismatched loss of precious power. With the Heathkit HFT-9 working for you, there's no chance of losing a QSO to stray attenuation.

The HFT-9 100% power transfer

To a wide variety of output impedances including dipoles, inverted vees, verticals, mobile whips, windoms, random lengths and similar types fed by coax balanced line or a single wire. 4:1 ferrite balun is built in for use with balanced open wire feeders.

A large 12-tap air wound inductor

With silver plated wire and tap selector, gives you almost unlimited matching range between 1.8 and 30 MHz. Continuously variable transmitter/antenna controls make optimum adjustments easy. The back panel has two SO-239 co-ax connectors, a terminal strip for balanced line and long wire antennas and separate ground post.

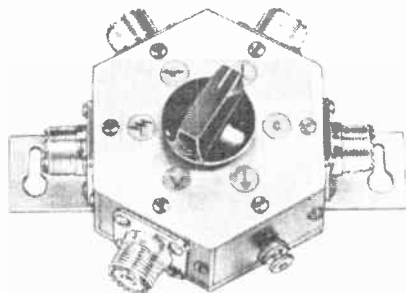
When every watt counts

And the difference between full contact and half copied call sign may rest on the performance of your antenna tuner alone, don't take chances. Buy the best you can find. But remember the HFT-9 is the only one that offers build-it-yourself reliability coupled with trusted Heath engineering. Altogether an advantage no other Tuner can match!

Order

HK75S (HFT-9 50W Tuner) £49.95

Antenna Co-Ax Switch HD-1234

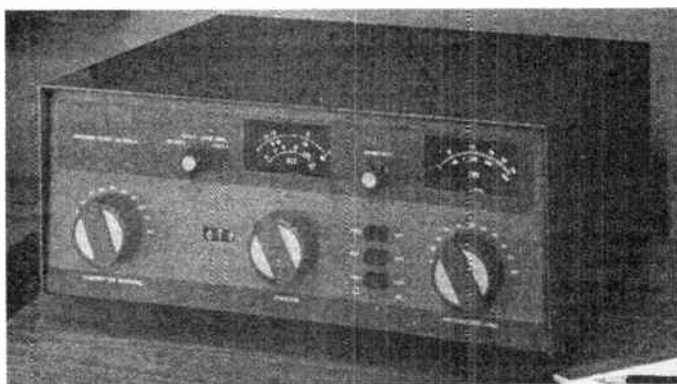


Choose from up to four antennas or interconnecting equipment quickly, efficiently. Switches one RF source to any one of several antennas or loads, while grounding all outputs not in use. Handles 2kW PEP with maximum 1:1 SWR to 250MHz. Built in bracket with keyhole slots allows convenient mounting on station cabinets, desk or wall.

Order

HK25C (HD-1234 Antenna Sw) £19.95

Deluxe Antenna Tuner SA-2060A



- Incorporates dual Wattmeter/SWR Bridge
- Covers 160 through 10 meter bands with continuous tuning
- Eliminates the loss of precious, mismatched power
- Select coaxial antenna, long-wire feed or bypass
- Constructed to minimize RF loss at high frequencies

Touchy solid-state finals can rob you of precious bandwidth. The SA-2060A Deluxe Antenna Tuner can solve that problem. The built-in wattmeter/SWR bridge has an accuracy of $\pm 5\%$ forward accuracy. Bypass for your tri-band beam or dummy load, or select either of two coax outputs. Connect unbalanced feedlines of long wire antennas – a built-in 4:1 balun lets you use balanced feedlines. A convenient front panel counter permits quickly setting the continuously-variable inductor to previously calibrated frequencies. The SA-2060A Tuner will match your antenna to any frequency in the 160-10 meter HF spectrum, including MARS frequencies and the recently approved new band allocations.

Dual wattmeters read forward and reflected power simultaneously For more efficient low band operation. Wattmeter section, installs directly into transmission line to measure power on all frequencies between 1.8 and 30MHz. Measures output up to 200/2000 watts in the forward direction and up to 50/500 watts reflected. Silver-plated straps and roller contact assembly minimize RF loss at high frequency operation. Large feed-through insulators withstand high-voltage RF. Handles power inputs up to 200 watts PEP on SSB and 1000 watts CW.

Specification

Frequency Coverage: Continuous coverage, 1.8 to 30MHz. Input Impedance: 50 Ω at match. Input Transformation: 4:1 balun. Output Impedance: Wide range. Insertion SWR: Less than 1.1:1. Power Input Capacity: Full legal limit. Dimensions: 146 x 368 x 352mm.

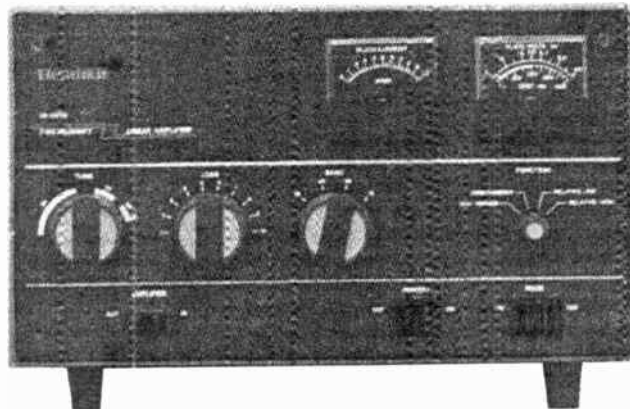
Order

HC53H (Heathkit SA-2060A) £249.95

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Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

2kW Linear Amplifier HL-2200



- Low-price per watt in a 2 kilowatt Linear Amplifier
- Designed to use with exciters that deliver 100 watts or less

More of what you want

Rugged dependability, engineering sophistication and features, and cost-effective performance, are provided by the Heathkit HL-2200.

More power in the pile-ups

A pair of world-famous 3-500Z's run at 2000 watts input of QRM-bursting PEP on sideband and load to 1kW input for CW and RTTY. The broadband, pre-tuned π input yields maximum efficiency with extremely low distortion over the 80-15 meter spectrum. Just 100 watts of exciter will drive the Amplifier to full output – with the kind of signal that catches the new DX, gets priority traffic through and your call sign heard clearly, year after year.

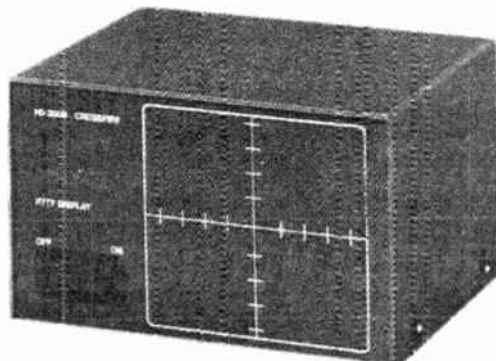
Specification

Band Coverage: 80, 40, 20 & 15 meters. Max. Power Input: SSB, 2000W PEP; CW, 1000W; RTTY, 1000W. Driving Power: 100W. Duty Cycle: SSB, continuous voice modulation; CW, continuous (max. key-down 10 min); RTTY, 50% (max. transmit time 10 min.). Third Order Distortion: -30dB or better. Dimensions: 210 x 378 x 368mm.

Order

HC51F (Heathkit HL-2200) £649.95

Crossfire Tuning Indicator HD-3006



- Quick and easy tuning of RTTY transmissions, without the need for an oscilloscope or costly equipment

The Heathkit HD-3006 Crossfire is a visual tuning indicator

For radioteletype (RTTY) communication. Sixteen LEDs make up the display. Eight vertical LEDs identify mark signal strength; eight horizontal LEDs do the same for space signal strength. Just tune your receiver for maximum vertical and horizontal display – you'll get a strong signal for your computer or printer.

Wide voltage range

The Crossfire has a wide voltage range and is compatible with almost any interface/terminal unit that has oscilloscope outputs for tuning. Put your scope back on the workbench.

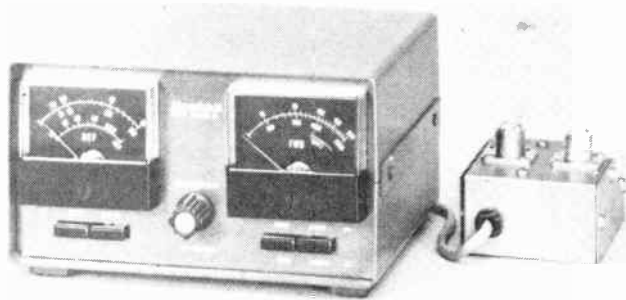
Specification:

Display: Two 8-LED bars. Each bar requires approximately 14dB no-signal-to-signal voltage ratio (5:1) for full use of the bars. Input Level: Threshold, 0.3 volts rms on AC and 0.5 volts DC. Maximum, 15 volts rms on AC and 15 volts DC. Power Supply: The separate power supply supplied with the kit is for 120V AC only and must not be connected to UK mains. Instead it can be used with one of our American Mains Transformers, or without the power supply the unit may be driven directly from an 8 to 16V DC supply. Dimensions: 83 x 127 x 102mm.

Order

HT43W (Heathkit HD-3006) £49.95

Dual HF Wattmeter HM-2140A



- Newly styled to match the HW-5400
- Reads PEP or average power from 1.6 to 30 MHz
- Has a factory assembled and calibrated sensor
- Tune your transmitter for optimum output with at least $\pm 5\%$ forward power accuracy
- Enjoyable, easy-to-build two evening kit

Is your station performing at peak efficiency on the low bands?

Installed in your transmission line, the new HM-2140A monitors both forward and reflected power simultaneously. An additional scale on the reflected meter reads SWR directly from 1:1 to 3:1 for fast easy measurement of your outgoing signal. The Hams at Heath designed the HM-2140A to measure your transmitters output up to 200 2000 watts PEP in the forward direction and up to 50/500 watts ($\pm 7.5\%$) reflected. Pushbutton switched high and low power ranges plus a factory tested sensor ensure precision readlines every time. Another dual-position switch enables you to read PEP or Average power instantly.

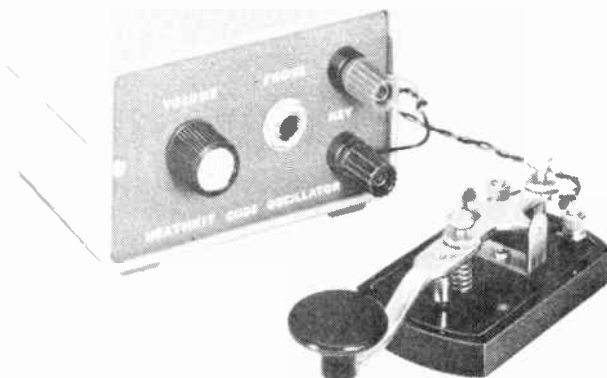
For complete portability in the field

This valuable instrument can be operated on a 9 volt battery (not included). Where AC power is available you can use the AC Battery Eliminator below. For added convenience the precision RF sensor can be mounted in cabinet, or up to four feet away. A scale labelled BATT on the forward meter when used with the front panel sensitivity control lets you observe the life condition of the battery. The HM-2140A is housed in a ruggedly portable all-aluminium cabinet and wears the proud new charcoal and night-brown colours of our latest state-of-the-art transceivers. Like them, this Dual HF SWR/Wattmeter offers you the reliable self-serviceability and satisfaction we pack into every Heathkit product.

Order

HK76H (HM-2140A Dual Wattmt)	£99.95
HK77J (PS-2450 Power Unit)	£14.95

Morse Code Practice Oscillator HD-1416

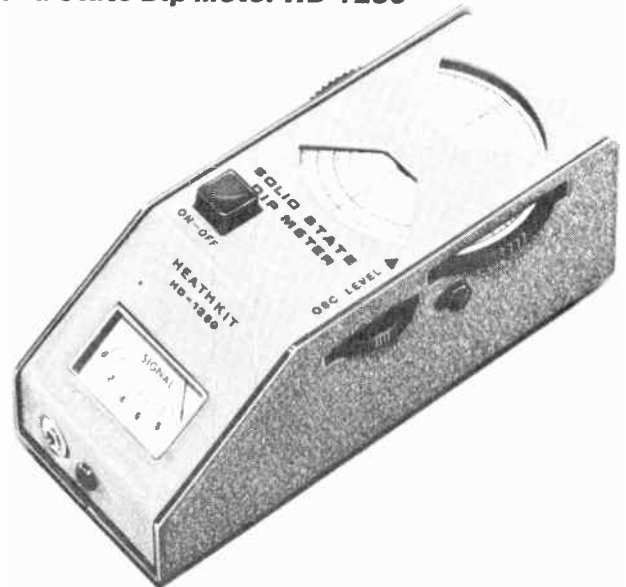


Use this practice oscillator to learn morse code and pass the RAE for the HF bands. Most components mount on a single circuit board for easy assembly. The unit operates from a PP3 9V battery (not supplied) and is complete with a telegraph key with adjustable rebound. There is a built in speaker, volume and tone controls and a headphone jack for private listening. The manual includes sections on operation, application and learning the code. Once you get your licence, use the kit as a sidetone oscillator for any transmitter, using negative grid-block keying. The cabinet measures 111 x 105 x 67mm.

Order

HK22Y (HD-1416 Morse Cd Osc)	£19.95
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Solid State Dip Meter HD-1250

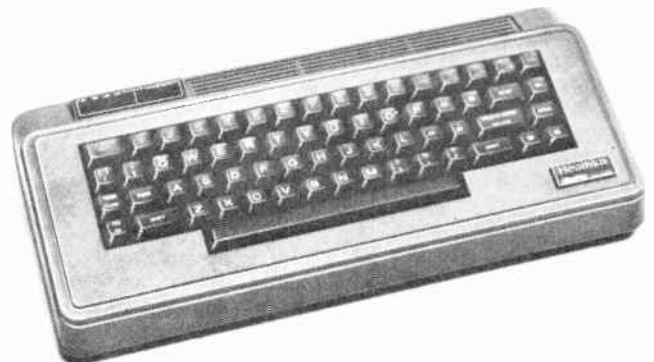


One of the best solid state dip meters around, this kit features a MOSFET paraphase amplifier and hot-carrier diodes for more sensitivity and a better dip. The Colpitts oscillator covers 1.6 to 250MHz in fundamentals and uses a Q multiplier for greater detector sensitivity and a responsive $150\mu\text{A}$ meter movement for positive resonance indications. The meter operates from a 9V battery (not supplied) and is completely portable. A moulded grey carrying case protects the rugged aluminium meter and the seven section-coded, pre-adjusted, plug-in coils. The assembly manual has a detailed section on operation.

Order

HK23A (HD-1250 Dip Meter)	£79.95
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Ultra-Pro CW Keyboard HD-8999



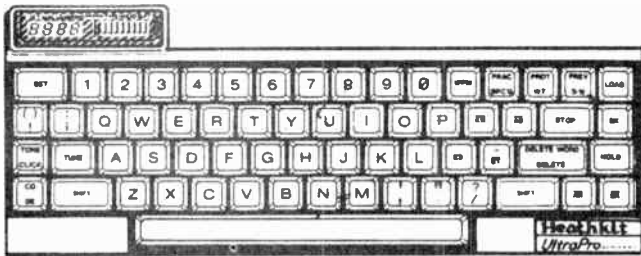
- The most intelligent microprocessor-based CW keyboard, with more functions and user-flexibility than any other
- Four level random practice mode allows 1000 different and repeatable 3000 character training sessions with unique 'copy' mode to teach typewriter proficiency "hands on"
- Sends letter-perfect code at speeds up to 99WPM
- Non-volatile CMOS RAM and battery included
- Two-key rollover keeps up with high-speed typists

The Hams at Heath have done it again!

They've developed a CW keyboard of unbelievable versatility that defines a new standard of quality and value. The HD-8999 Ultra-Pro CW Keyboard uses a custom microprocessor and the latest in "human engineered" keyboard designs as a foundation for the most flexible and feature-packed CW operating aid you can own. Much of its capability can be understood by studying the keyboard illustration carefully. At upper left is the status panel, with a 4-digit LED display to show a function or values such as speed, weighting, serial number, remaining message character space, input error, tune mode, plus on/off status of sidetone, keyclick and buffer protection. To its right, a 3-colour, 8-segment LED bar graph indicates the fullness of the type-ahead buffer. All ten memory buffers are variable in size to avoid wasted memory space and can be loaded, edited and transmitted with only 1 to 3 keystrokes. All operating parameters can be set from the keyboard, and absolute accuracy is assured with a crystal-controlled clock.

Built-in diagnostics

Perform a complete self-check upon power-up. The back panel has on/off rocker switch, power socket, positive and negative keying phono jacks, reset switch, volume/pitch controls and a headphone jack. Build the Ultra Pro yourself with one of our world famous assembly manuals and you can pocket the savings, while



enjoying one of our most fascinating kits. The UltraPro is a professional-action keyboard with many features and innovations not to be found on units at twice the price.

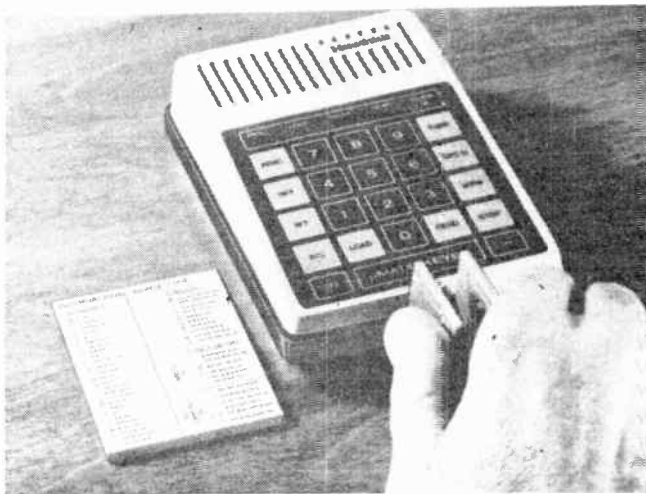
Specifications:

Speed Range: 1 to 99 WPM. Spacing: Less than or equal to speed setting. Weighting: Normal plus five "light" and five "heavy" settings. Serial number: 1 to 9999. Text Buffers: 1 to 10: variable length, with a total capacity of 435 characters. Individual buffers may be protected. 64 character type-ahead buffer. Keyer Output: +250 volts @ 100mA; -200 volts @ 40mA. Memory Backup: Three mini cells (included) with typical 1 year life. Sidetone: Adjustable pitch (300-1500 Hz) and volume. Indicators: 4-digit LED display. SET, MSG, LOAD, PRAC and type ahead buffer status LED's. Operating Range: 32-104°F (0-40°C). Power: 7.5 to 11V AC or 11 to 16V DC 450mA max. Dimensions: 7.3 x 39.4 x 20cm.

Order

HK78K (HD - 8999 Pro CW Keybd) £149.95

µMatic Memory Keyer SA-5010



- Add programmable excellence to your CW exchanges
- Up to 10 variable-length buffers let you store text or "command strings" so you can sequence alterations
- Four level random practice mode allows 6400 different and repeatable 3000 character training sessions

Bring more fun and results to your CW activity!

Add iambic programmable speed and automatic message execution to your operating skills with the Heathkit µMatic Memory Keyer. Its flexible, 240 character memory and reversible capacitive-touch paddles will revolutionise your code sending ability, ease hand fatigue, multiply QSO's — and incoming QSL's.

Memory is effectively increased by the use of patented 'command strings'

Which let you store text in several buffers and link them together in whatever sequence you desire. Command strings can also select the speed, weight, spacing and auto-repeat count for each of those messages. A special editing feature allows you to recover from any errors made while loading a buffer.

Use the audible-feedback, 22 position keypad

To select character formation speeds and spacing, any of 11 weight settings, pause, repeat count, buffer number and mode with ease. Enter text at whatever speed and weight are comfortable for you, and send it with any other settings you wish.

Text may be manually added

Into the message being sent. Storing a Pause in text or command strings will cause the keyer to reset automatically for insertion of serial numbers, special greetings or station RST reports. A CMOS memory with battery backup retains the buffer

contents, last-selected speed, spacing, weight and repeat count whenever it is turned off or unplugged.

Other deluxe features include

A built in oscillator and speaker with volume/pitch controls, phonejack and earphone, entry error alarm, positive or negative keying, LED mode indication and a money-saving auto shutoff utility should you forget. The µMatic's die cast base is evenly weighted to reduce movement during keying. Requires only the 240V AC battery eliminator for full operation. Discover the newest phase of CW fun.

Specification

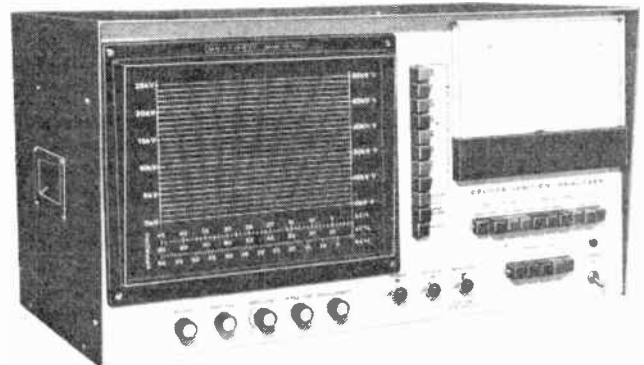
Speed Range: 1 to 99 WPM. Character Spacing: Less than or equal to speed setting. Number of Buffers: 1 to 10. May be used to store text or commands. Buffer Size: 240 characters plus commands total. Weighting: Normal plus 5 light and 5 heavy settings. Auto Message Repeat: 0 to 9 (sent 1 to 10 times). Keyer Output: Solid state: +250 volts @ 100mA; -40mA (separate, protected output jacks). Memory Backup: 3 watch batteries (supplied). 1 year typical life. (No battery drain unless the keyer is removed from AC power source). Sidetone: Approximately 300 to 1500 Hz adjustable. Power Requirement: External pluggable transformer (optional) or 11 to 16 volts DC @ 200mA. Dimensions (excluding paddles): 4.1 x 10.5 x 15.2cm.

Order

HK41U (SA - 5010 uMatic Keyer) £99.95
 HK79L (PS - 5024 Power Supply) £17.95

CAR TEST KITS

Professional Ignition Analyser CO-2600



- Displays primary and secondary patterns on 12" CRT
- Measures RPM, dwell angle and ignition voltage
- Shorts out cylinders to facilitate balance tests

Designed for the hobbyist yet perfect for the professional garage

This superb kit assures you a precision tune-up every time. Rock steady parade patterns are made possible by the latest design in inductive pick-up circuitry; and switch selection of 4, 6 or 8 cylinders. Dwell measurements are indicated on the big 200mm (8in.) meter.

The unit has two voltage ranges

0 to 2V for corroded connections and points measurements and 0 to 20V for battery condition and general distribution checks. Cylinder selection buttons can be pushed in multiple numbers so that banks of cylinders can be shorted for carburettor balance and for display of one or more cylinders. Both parade and superimposed displays of primary or secondary waveforms with 10:1 and 2:1 trace expansion are available on the 305mm (12in.) display.

Rugged high temperature oil and petrol resistant neoprene cables

Provide easy, positive connections to engine. For use with 4, 6 or 8 cylinder 4-stroke or 2-rotor Wankel engines and standard, transistorised or CD ignition systems.

Specifications

CRT Size: 12 inches (diagonal). Meter Size: 8 inches. Signal Pickup: Direct for primary, inductive for parade, trigger and capacitive for secondary. Tachometer Ranges: 1000, 3000 and 6000 RPM. Voltmeter Ranges: 2 & 20V DC. Tachometer/Voltmeter Accuracy: ±3% of full scale on any range. Scope Vertical Expansion: 2 to 1 minimum. Operating Temperature Range: 32 to 122 degrees F (0 to 50 degrees C). Power Requirement: 120/240V AC, 50.60 Hz. Overall Dimensions: 32.72 x 64.14 x 35.89cm.

Optional timing light

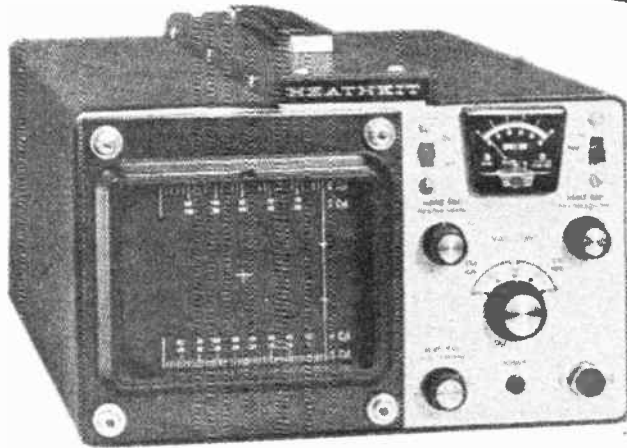
An optional timing light with advance meter (COA-2600-4) plugs directly into the CO-2600 Analyzer and provides a bright timing flash that registers clearly at up to two feet, even in daylight. Built-in RPM/Advance scales measure RPM from 1500 to 4500 and distributor advance from 0 to 60 degrees, includes 3m cable with connector.

Order

HK30H (CO - 2600 Ign Analyser) £599.95
 HC88V (Heathkit COA - 2600 - 4) £69.95

Portable Ignition Analyser CO-1015

NEW



- Displays primary and secondary waveforms
- Uses clamp-on, inductive pulse pick-up method
- Built-in dual range tachometer

Diagnose and resolve most ignition problems fast with this handy Ignition Analyzer. Quickly detect difficult to pinpoint ignition problems.

Select one of four different patterns, primary or secondary in parade or superimposed displays. For a detailed analysis of a waveform's components, horizontal traces can be expanded 10 to 1 and the vertical sweep can be expanded 2 to 1.

Use it with any standard, transistorised or C-D ignition on 3, 4, 6 or 8-cylinder engines with distributors. Includes adaptor for GM HEI systems. Accompanying handbook illustrates dozens of detailed cause-and-effect waveforms. Operates on 120/240V AC.

Order

HC91Y (Heathkit CO-1015) £359.95

Digital Engine Analyser CM-1551

NEW



- Measures dwell angle, engine speed, DC voltage, resistance and current
- 3½ digit LCD display is easily readable even in bright sunlight

Versatility at an affordable price, that's the CM-1551

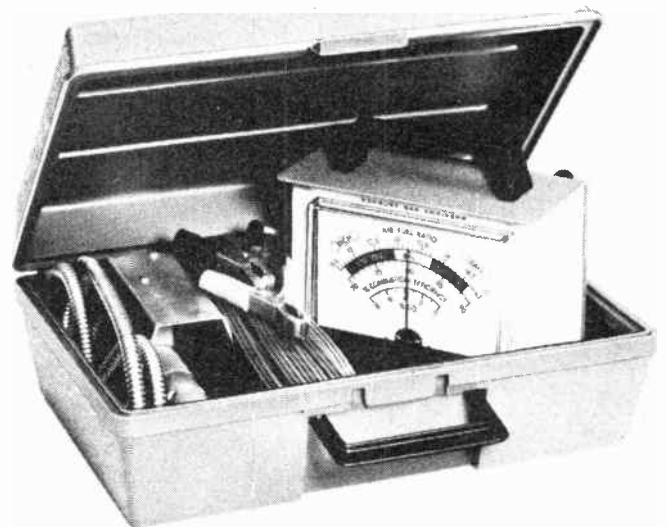
With this self-powered portable digital analyzer, you can make critical tune-up measurements to help determine if your vehicle is operating at peak performance. Check dwell on 4, 5, 6 and 8-cylinder engines from 0 to 90° within ±0.2%. Check idle speed in two tachometer ranges up to 10,000 RPM with an accuracy of ±0.1%. Measure DC voltage in two ranges up to 200 volts at ±1.5%, current to 20 amps with ±3% accuracy and resistance to 2 megohms at ±1.5%.

Using the optional Shunt Accessory (CMA-1550-1), the CM-1551 can measure starting current and battery charge/discharge currents. Power is supplied by a 9-volt battery (not included). Analyzer displays circuit polarity, low battery and over-ranges. Measures 311 x 203 x 92mm.

Order

HC94C (Heathkit CM-1551) £169.95
 HC95D (Heathkit CMA-1550-1) £23.95

Exhaust Gas Analyser CI-1080



- Squeeze more performance power from your car
- Includes all you need for total exhaust vapour analysis

Possibly the best way

To guarantee your engine is running at maximum potential and emitting as few pollutants as possible is by testing it with this easy-to-build kit. By measuring thermal conductivity of your exhaust gases, it can show the air-to-fuel ratio, overall combustion efficiency and percentage of carbon monoxide present. From these you can determine if a car's fuel mixture is unnecessarily too rich or weak for best economy. The easy to read 114mm colour coded meter is designed to hang on a partly open window or stand upright without marring paint finishes. The removable sensor/probe assembly uses a flexible stainless steel tube for safe conduction of all gaseous material. The instrument is housed in a rugged carrying case with foldaway handle for easy portability and storage.

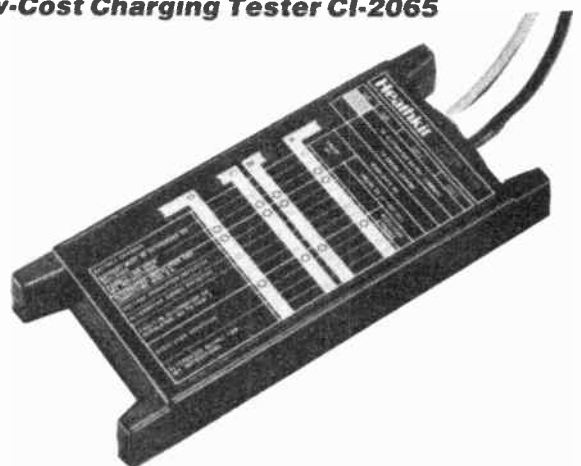
Specification:

3 meter scales: Air to fuel ratio: 11.5 to 15.0. Combustion efficiency: 70% to 90%. Carbon monoxide: 0 to 80%. Exhaust type: From 4-stroke petrol engines (cannot be used with catalytic converters). Meter: 114mm, 100-0-100µA. Accessories supplied: 2 x 13m battery cord; 6.4m sensor cord; 762mm exhaust flexible tube. Power requirement: 6V or 12V car battery at 150mA.

Order

HK31J (CI-1080 Exhst Anlysr) £119.95

Low-Cost Charging Tester CI-2065



This easy to use lightweight portable instrument will check out your car's charging system components with three quick tests. The tester will show you if the battery has sufficient charge to start the engine, if the battery is being charged by the alternator, if the voltage regulator is faulty and if the alternator stator windings and rectifier diodes are functioning properly. The tester may be used with cars with a negative chassis, 12V charging system that has an alternator or any 12V negative ground charging system that employs a 3-phase alternator using six rectifier diodes. Size 140 x 64 x 19mm.

Order

HK29G (CI-2065 Chargng Tstr) £24.95

KITS FOR THE HOME

Digital Alarm Clock GC-1107



- 12 or 24 hour format
- Alarm delay function allows you to sleep on for up to an hour
- Flashing display alerts you to power failures

This easy to build kit has a pleasing blue-green display that automatically adjusts itself to ambient light conditions. In addition to hours and minutes, the clock indicates AM or PM, pulses the colon every second, tells you when the alarm is set, synchronises the alarm if in 24-hour format and alerts you if the clock has been shut off during a power failure. The alarm on/off switch is easily accessible at the rear of the cabinet. The 'sleep' button will delay the gentle electronic alarm for 9 more minutes of pleasant dreams, up to one hour total. The 'slow' and 'fast' setting switches let you advance the digits for easy accurate setting of the correct display and alarm times. Get started in kit-building today with this attractive solid-state clock for accurate time-keeping and reliable, friendly alarm. 240V AC operation. Size 5.7 x 17.8 x 12mm.

Order

HK01B (GC-1107 Dig Alarm Cl) £29.95

Digital Wall Clock GC-1720



- Cordless
- Accurate to within ± 1 minute per year
- Big 1" high LCD display
- Long battery life

This attractive digital wall clock will fit into any confined space. The slim, simulated oak-grain case houses the easily-built electronics and the large LCD display, providing long battery life and high accuracy. 12 or 24 hour format. The clock will run on a single 1.5V AA alkaline cell (not supplied) for about 2 years. Size 13.3 x 18.1 x 3.8mm.

Order

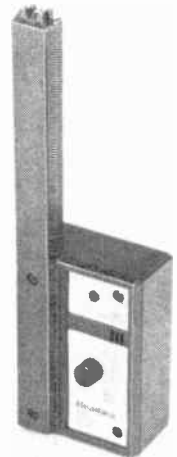
HK40T (GC-1720 Wall Clock) £49.95

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Phone before 2pm for same day despatch.

Heat Sniffer NE-2112



- Tracks down the source of draughts easily

Find and seal leaks tightly

The answer to every home owner's need for a quick and accurate way to track down pesky draughts. Gaps in door frames and window sills can cost you a bundle in heating or cooling expenses by letting in hot or cold air from the outside. With the aid of the NE-2112 Heat Sniffer you can locate and measure those costly comfort-robbing leaks in seconds. Find and seal leaks tightly before the chill of winter arrives.

The Heat Sniffer is easy-to-use:

Locate draughts with pin-point electronic accuracy. Turn unit on and adjust knob to silence unit at present room temperature. Then move the Heat Sniffer's sensor along door frames, window sills or any other place where infiltration of cold air might occur. Any change in temperature unbalances the circuit and sets off a loud beeping alarm and a bright flashing LED. The faster the beeping and flashing, the greater the temperature difference — and the bigger the leak. For best results the indoor and outdoor temperatures should be significantly different (10°F minimum).

One evening assembly:

A comprehensive Heathkit construction manual leads you every step of the way. For use in ambient temperatures from 59-95°F (15-35°C). Requires a 9V DC battery (not included). Dimensions 4.1 x 6 x 21cm.

Order

HK80B (NE-2112 Heat Sniffer) £24.95

The "Informer" Ultrasonic Alarm GD-49



- Up to 25' range
- Time delay to allow deactivation
- Disguised to look like a fine hardcover book.

An ultrasonic intruder alarm that looks like a book! It will protect any room in your house, detecting an intruder's movements up to 7.5m (25ft) from the unit. Two alarm outlets are provided, one triggers after a short delay, and the other after 30 seconds. The total load permissible on these two outlets is 3A either individually or shared. The short delay gives you time for you to leave the room after activation and time to deactivate the alarm when you re-enter the room.

The alarm can be set to turn off automatically after 30 seconds or to remain on until switched off. Thus it could be used as an automatic light switch for your garage, basement, attic or any place where you want entry into an area to turn on the light.

EDUCATIONAL PRODUCTS Soldering Course EI-3133



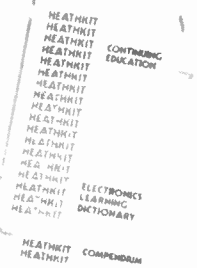
With 95% of all returned kits found to be faulty due to poor soldering, here's a course that could benefit many hobbyists. Using the proven programmed instruction format the step-by-step text begins with mechanical connection and progresses through tinning, temperature control, different types of solder etc. A practice kit complete with circuit board, components and solder is provided for construction of a two transistor light oscillator. Soldering iron and tools are not included.

Order

HK33L (EI-3133 Soldering Crs)

£19.95

Electronics Dictionary EB-1010



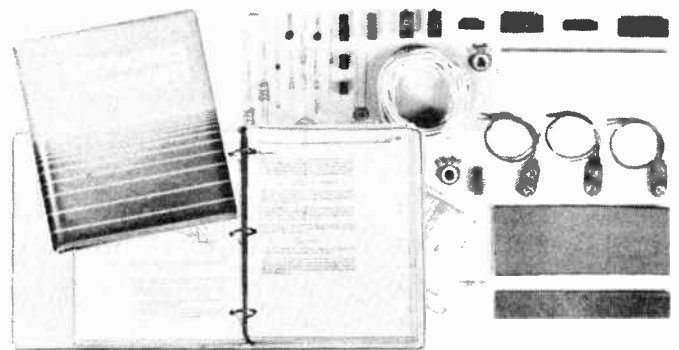
Sixteen topic outlines make this dictionary more than just a book of definitions. It's actually a low-cost electronics "short-course". This 832 page Learning Dictionary from Heathkit should be a part of your professional reference library.

Order

HK45Y (EB-1010 Elect Dctnry)

£16.95NV

Concepts of Electronics For Hobbyists EE-3140



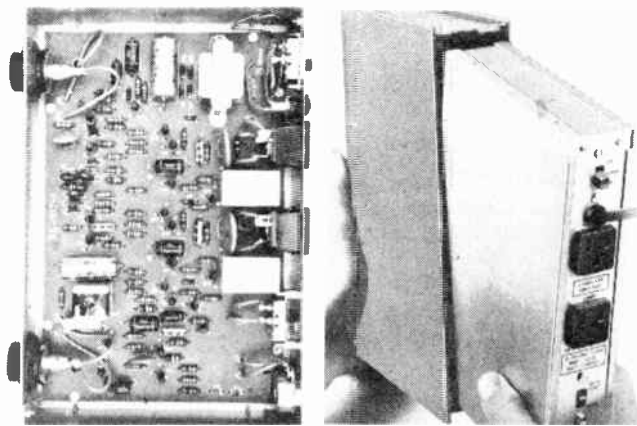
- Build and experiment with 26 different electronic circuits
- Easy to digest units guide you

Learn the basic principles of direct current, alternating current, active devices, electronic circuits, digital electronics and digital computers. Experiments assure your understanding of do-it-yourself electronic projects and all components required are included. To do the experiments you will need the ET3100 Trainer and a multimeter. No prior knowledge of electronics is required. Over a thousand pages of simple to understand text and illustrations in a durable binder are provided.

Order

HK04E (EE-3140 Hobby Elect)

£69.95



It could be used to sound a buzzer when movement occurs, such as a child leaving its bed. The intruder alarm is completely enclosed in metal and can be installed anywhere that a power socket is available. A further case is provided that looks like a book cover and helps to disguise the identity of the device. Size in book cover: 257 x 191 x 60mm.

Order

HK02C (GD-49 Ultra Intruder)

£69.95

Flood Alarm GD-1701



- Alerts you to leaks as soon as they occur
- Long battery life
- Sensor fits anywhere

Protect your property with this flood alarm that detects leaks before expensive damage is caused! The water sensor will stick anywhere, and when activated produces a loud insistent alarm coupled with a flashing red LED to ensure instant attention.

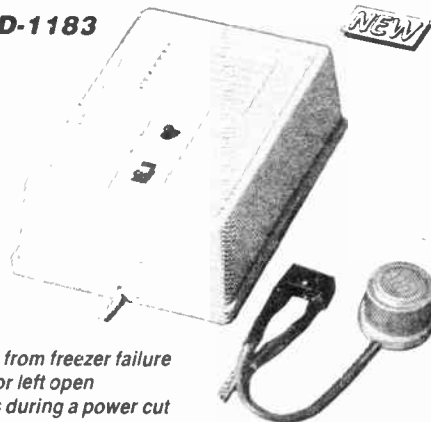
Includes 7.5m of sensor to alarm w.r.e. The unit will run for a year on one 9V alkaline battery (not included). Size 12.4 x 9.2 x 4.4 cm.

Order

HK71N (GD-1701 Flood Alarm)

£24.95

Freezer Alarm GD-1183



- Prevents costly food loss from freezer failure
- Be alerted to a freezer door left open
- Freezer alarm even works during a power cut

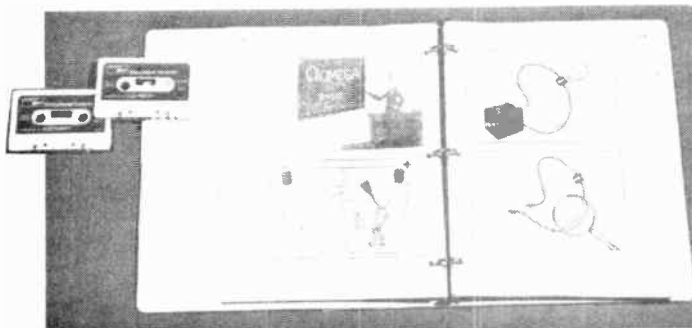
Protect your meats and other frozen foods from spoilage by installing an instant alarm that warns of a failure in your freezer's cooling system or a door left ajar. Two-speed alarm beeps and red LED flashes at a slow rate if inside temperature rises above -6.5 C; faster if door stays open too long. Requires 2 "C" batteries (not supplied). Slide switch shuts off alarm. Includes 6m of thin hookup wire, plug mechanical, temp and water sensors - with application ideas.

Order

HC05F (Heathkit GD-1183)

£29.95

Basic Electricity Course EE-3100



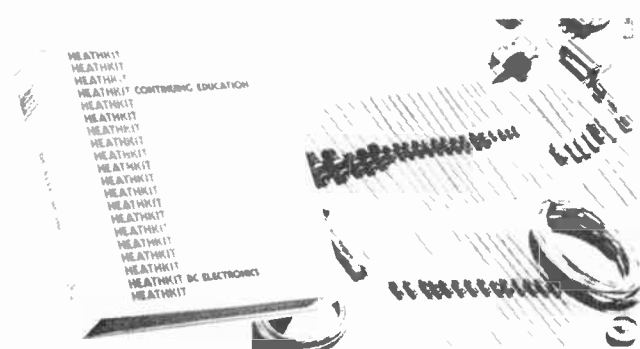
No technical background is required for this course which uses audio-visual teaching methods to introduce you to electricity. A programmed instruction text, enhanced by clear visuals and two audio cassettes teaches you each concept in an easy to follow sequence to build a solid foundation. A specially written workbook reinforces the learning process. When you complete the course you will know the basics: Ohm's Law, series and parallel circuits, electromagnetism, direct and alternating current, generators, motors and basic meter operation. This course serves as a valuable introduction to the Heathkit Basic Electronics Series (EE-3101A to EE-3106A) described below.

Order

HK32K (EE-3100 Basic Elctry)

£29.95NV

DC Electronics Course EE-3101A



- An excellent starting point for the person just beginning to learn the theory and applications of electronics
- Develop a detailed knowledge of electronics rapidly

This course forms an excellent starting point for those just beginning to learn electronics. The course covers current, voltage, resistance, magnetism, Ohm's Law, electrical measurements, inductance and capacitance. It has been completely updated to ensure that you learn the most up-to-date material available. This professionally designed course leads you step-by-step to a complete understanding of DC electronics and allows you to learn at your own pace. Hands-on experiments increase your knowledge by putting your newly gained information to work immediately on practical exercises. The course includes the comprehensive text in a durable vinyl binder and all the components you need for the experiments. To complete the experiments you will need the ET3100 Trainer and a multimeter.

Order

HK05F (EE-3101A DC Elct Crs)

£49.95

AC Electronics Course EE-3102A

- Advance your knowledge of electronics with a complete understanding of alternating current
- Picks up your education where the Heathkit DC Electronics Course leaves off
- Completely updated to bring you the latest, most accurate information on the subject

Easy to understand

Self instruction course advances your knowledge of electronics theory. The Heathkit AC Electronics Course provides complete and comprehensive coverage of all the principles of alternating current. Completely updated to bring you more detailed theory.

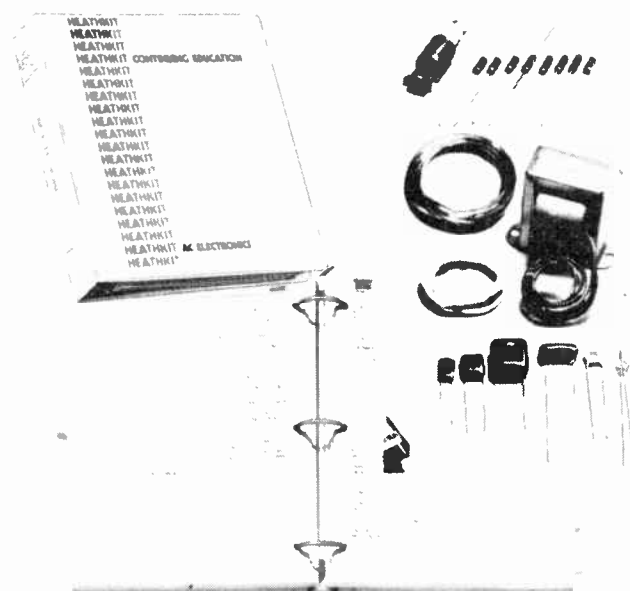
Programmed learning makes it easy.

As with the other Heathkit self-instruction course you begin with basic theory and you continue adding to your store of information until you are ready for the next

concept. You work at your own pace, then complete reviews to measure your progress. The concepts you study will come to life as you conduct nine experiments that turn theory into practical experience.

The Heathkit AC Electronics Course

Provides you with a detailed understanding of alternating current. Your text covers such topics as; Alternating Current, what is it and where is it used? Generating AC, AC values and waveforms, AC measurements — meters oscilloscopes, resistance and calculations. Capacitive circuits, including a review of capacitors and capacitance in AC circuits, RC circuits and a complete discussion of the various applications of capacitive circuits. You'll continue on to inductive circuits. The text



discusses inductors and inductance, the use of inductors in AC circuits along with a section on RL Circuits. A detailed section of the AC Electronics Course is devoted to tuned circuits — the RLC circuit, resonance, series resonance, Q and bandwidth in series, parallel resonance and LC filters. You'll complete your study of AC electronics with a look at transformers, including transformer ratios, losses and applications.

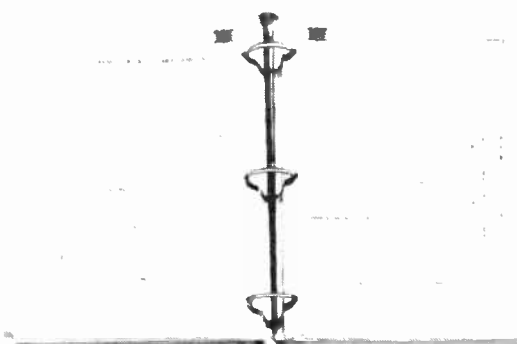
In short you'll vastly expand your knowledge of electronics in a fairly short time. With Heathkit courses you work at your own speed in the comfort of your home, amassing page after page of valuable knowledge. The course includes the comprehensive text in a durable vinyl binder and all the components needed for the experiments. To complete the experiments you will need the ET-3100 Trainer and a multimeter.

Order

HK06G (EE-3102A AC Elct Crs)

£59.95

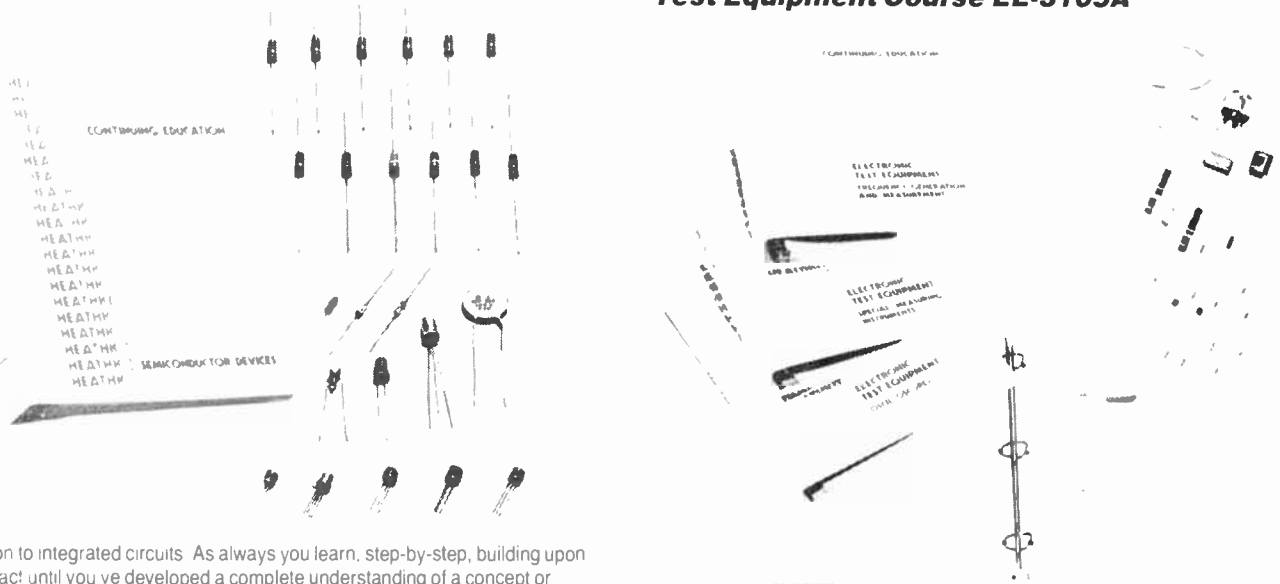
Semiconductor Devices Course EE-3103A



- Completely updated with the most recent information from the fast moving world of solid-state electronics
- Continues your electronic studies with complete coverage of solid state devices and how they are used
- More hands on experiments for practical experience

Carrying on from the AC Electronics Course, this completely up-dated course continues to build your understanding of electronics. This course covers the fundamentals of semiconductors then looks in detail at diodes, zener diodes, tunnel diodes, varactor diodes, PIN diodes and others. You will learn about the operation of bipolar transistors and their characteristics, field effect transistors, thyristors, triacs, unijunctions and opto electrical devices. There is also a brief

Test Equipment Course EE-3105A



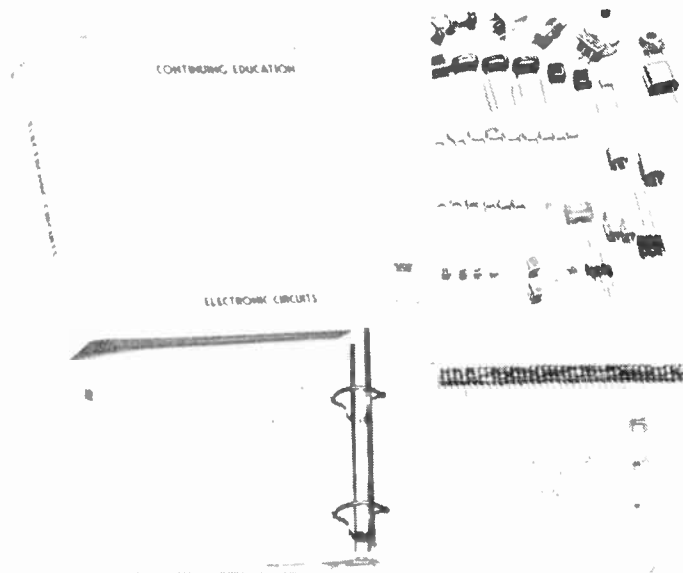
introduction to integrated circuits. As always you learn, step-by-step, building upon fact after fact until you've developed a complete understanding of a concept or theory. Regular reviews reinforce your education and point out your strong areas — and those that need more work. Hands on experiments using the components supplied with the course give you first hand experience with semiconductor devices. To complete the experiments you will need the ET-3100 Trainer and a multimeter

Order

HK07H (EE 3103A Semi Dv Crs)

£59.95

Electronic Circuits Course EE-3104A



- Updated to include all the latest available information
- Put the knowledge you've learned in previous Heathkit courses to work for you, building more skills
- Hands-on experiments add to your enjoyment, and explain technical concepts presented in the course

The course covers basic amplifiers including biasing and coupling, then goes on to explain audio amplifiers, power amplifiers, video amplifiers and RF and IF amplifiers. There are detailed sections on operational amplifiers, power supplies, oscillators, pulse circuits and modulation. With the Heathkit Electronic Circuits Course you go directly from theory into practice. Like all Heathkit courses your text carefully and completely explains all concepts presented. You build fact upon fact leading to complete mastery of a subject. Clear illustrations explain difficult points and add to your understanding of the information presented with the easy to understand text. The Heathkit Electronic Circuits Course exposes you to the circuits you'll find in everyday electronics — and explains them fully. The well illustrated and concise text comes complete with an attractive and durable vinyl binder and over 100 electronic components for use in the experiments. You will need the ET-3100 Trainer a multimeter and oscilloscope.

Order

HK08J (EE 3104A Elect Crs)

£69.95

- Learn to use a wide variety of test equipment, oscilloscopes and meters
- Practical experience is stressed by experimentation

Learn to use a wide variety of test equipment. The course gives you the knowledge you need to make measurements, with analogue and digital meters, explains the operation and use of oscilloscopes in electronic testing and servicing. You'll also learn to use frequency generators and counters. A further section covers bridge circuits, curve tracers, spectrum analysers and logic probes. The course is split into four sections, each with its own vinyl binder. In addition to the texts and electronic components supplied you will need the ET-3100 Trainer. To fully appreciate the various parts of the text, it will also be necessary to have access to an analogue multimeter, a digital multimeter, oscilloscope, frequency generator and frequency counter.

Order

HK09K (EE-3105A Tst Eq Crs)

£69.95

Electronic Communications Course EE-3106A



- Develop expertise in electronic communications techniques
- Components for seven experiments are included

The Electronic Communications Course from Heathkit allows you to develop an understanding of broadcast and data communications fundamentals. It covers a wide variety of information including communication fundamentals — amplitude and angle modulation and the communications system. You'll learn about amplitude modulated circuits, suppresses carrier AM and single side-band. A section on AM receivers includes AM detectors and superheterodyne receivers. Sections on angle modulation, pulse modulation, antennas and communications systems are also included.

Seven hands-on experiments will add to your understanding. Build an AM transmitter, a balanced modulator, FM transmitter, receiver, pulse modulator, time division multiplex transmitter and a data communications modem. Parts are included. ET-3100 Trainer is required.

Order

HK42V (EE-3106 Elect Com Crs)

£64.95

Experimenter Trainer ET-3100B



You'll get maximum benefit out of the seven courses, DC, AC, Semiconductor, Electronic Circuits, Test Instruments, Communications and Electronics For Hobbyists by doing the hands-on experiments on this trainer. The trainer features solderless breadboard sockets for ease of component substitution, a 2-range



variable sine and square wave generator (200-20,000Hz), dual variable power supplies for positive and negative voltages from 1.2V to 16V up to 120mA, 1k and 100k linear potentiometers. A centre tapped transformer provides 30 volts rms for AC experiments. The trainer measures 308 x 298 x 89mm and is available in kit form or ready built (ETW-3100B).

Order

HK10L (ET-3100B Exp Trainer) £109.95
 HK11M (ETW-3100B Assembled) £179.95

Passive Circuit Design Course EE-1001

- This new course, first in a series, teaches the fundamentals of successful passive components circuit design
- Step by step programmed learning maximises retention, with unit exams to summarise material and verify progress

A passive component is one that does not provide a power gain

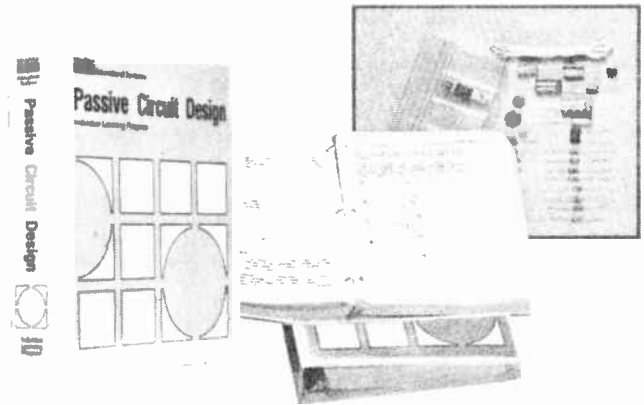
Typical examples include resistors, capacitors, inductors, voltage and current sources, transformers and diodes. Now with the Heathkit EE-1001 Passive Circuit Design Course you can design practical circuits utilising passive components. It establishes a foundation for more advanced design courses such as the EE-1002 Transistor Circuit Design Course, below.

Before you can design circuits, you must be able to analyse them

For this reason the first three units provide a thorough review of the techniques and associated mathematical concepts. Unit one is devoted to DC Circuit Analysis, Unit 2 teaches you Mathematics for Circuit Design and Unit 3 follows with AC Circuit Analysis. But a circuit that "works" on paper may not do what you want it to once built. Consequently Unit 4 Real Circuit Components, is devoted exclusively to the non-ideal properties of real components and various guides to help you select an appropriate-type component for a given application.

The remaining units concentrate on using these techniques to design circuits

Unit 5 Unregulated Power Supplies, discusses the design of numerous rectifier circuits and smoothing filters. Unit 6 Additional Passive Circuits, examines how clippers, clampers, peak detectors, multipliers, RC and other waveshaping circuits are designed. Unit 7 Selected Applications, illustrates seven general and nine measurement applications for passive circuits. In addition unit 8 contains ten hands-on experiments which reinforce the text material by giving you direct experience in prototype design. To perform these experiments you will need the ET-1000 Circuit Design Trainer.



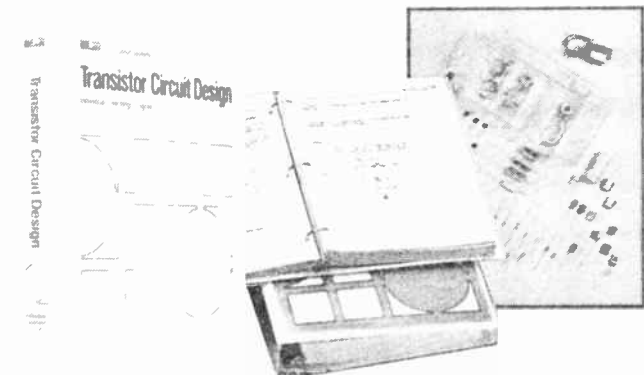
Two appendices with a resistor colour code chart

Plus circuits, equations and parameters related to passive circuit design conclude the material. Prerequisites for the Passive Circuit Design Course are a basic knowledge of DC and AC electronics algebra and trigonometry and a desire to learn.

Order

HK81C (EE-1001 Passive Crs) £54.95

Transistor Circuit Design Course EE-1002



- Concentrates on the fundamental techniques of successful transistor circuit design using the proven Heathkit programmed learning approach
- Thirteen experiments integrate theory and practicality; analysis is followed by step-by-step design examples

Learning is, and should be fun

Our second course in the Engineering Design Series honours that maxim and picks up where the EE-1001 Passive Circuit Design programme leaves off, by centering on the challenge of Transistor Circuit Design. In the same informative, friendly and hardware-intensive manner as its predecessor, EE-1002 takes the drudgery out of design theory, adds proven operants and introduces new methods that maximise understanding of each skill.

Complete state-of-the-art education

Perhaps the most unique feature is the abundance of summary and design guides provided in Unit 1 through 8. Chapters probe Bipolar Transistors, Biasing schemes, Common-Emitter Voltage Amplifiers, Common Base and Common Collector Voltage Amplifiers, Power Amps, Multiple Transistor Circuits, Field Effect Transistors and Common-Emitter Frequency Effects. Unit 9 contains thirteen in-depth hands-on experiments which develop the important know-how and confidence for constructing various types of transistor-based application circuits. The easiest way to perform these experiments is with the ET-1000 Engineering Design Trainer (below), which contains all of the necessary functions to complete all of the experiments. All prerequisite material is covered in the EE-1001 course.

Lastly, a 35-page Appendix

Provides a compendium of the circuit configurations, parameters and design guides found throughout the text, including device data sheets, formula and conversion tables, operating modes, graphical info and notation summaries. As in EE-1001 above a comprehensive reference index to the text round out the course presentation. For the serious student of electronic design theory and implementation, EE-1002 is a concise low-cost method of gaining valuable experience and knowledge toward the achievement of important career and educational goals.

Order

HK82D (EE-1002 Transtr Crs) £64.95

Analogue Circuit Design Course EE-1003 NEW



- Learn to analyse and design practical circuits
- Learn how to design circuits that have a reliability and quality of performance unobtainable in circuits using discrete components.

Third Course in Heathkit's Engineering Design Series

The Analogue Design Course shows you how linear IC's may be used in the design of circuits and instruments that would be impractical with discrete components. At the start of the course, you learn to analyse and design several amplifier and comparator circuits using the versatile opamp. Both these and comparators are discussed as specific illustrative examples. They are also used in designing several instruments such as an electronic ohmmeter and a logic probe.

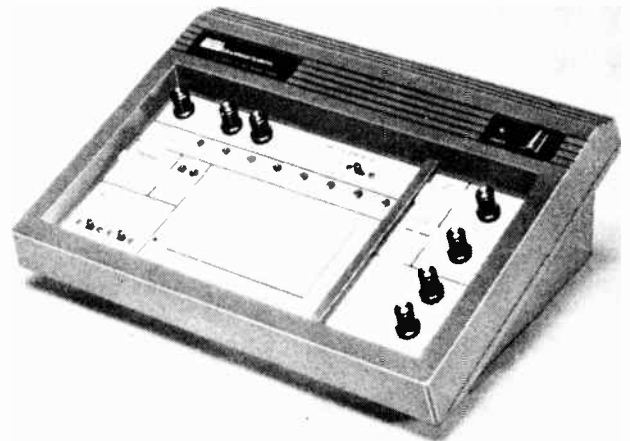
Learn to Analyse and Design

You will learn to analyse and design linear regulators, oscillators, waveform generators and other circuits that serve as basic building blocks in modern electronic systems. In addition, numerous applications from multipliers and phase locked loops to electronic communications are provided. Twelve accompanying experiments using the ET-1000 Engineering Design Trainer illustrate the design and operation of circuits discussed in the text.

Order

HM05F (EE-1003 Anlg Dsn Crs) £89.95

Engineering Design Trainer ET-1000



- Quickly build and test circuits for experimentation
- All power supplies protected against short circuit

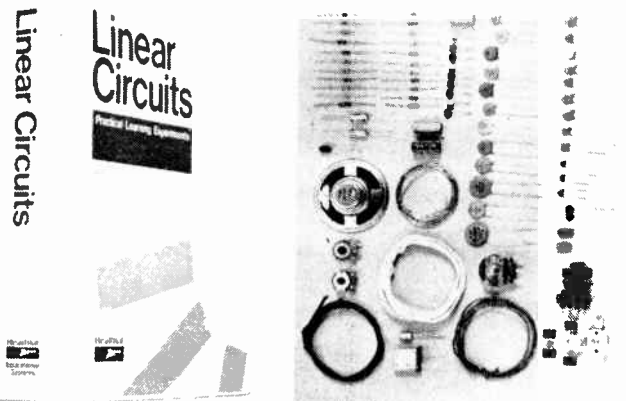
A complete mini-lab for dedicated circuit design

For students taking electronic courses or engineers requiring a flexible, all in one prototyping unit, the ET-1000 Circuit Design Trainer provides a self contained source of breadboarding capability. Has binary logic and data switches, eight buffered LED logic indicators, a five-range pulse width selector, 1k Ω and 100k Ω linear potentiometers, removable solderless breadboard, sine/square triangle, 1Hz to 100kHz generator, hi-low level logic probe, output voltages of 15V and 30V AC, +5V and \pm 12V DC and variable positive and negative power supplies from 1.2V to 20V. Mains operated. Dimensions 40 x 27.3 x 12.1cm. The trainer is available in kit form or ready built (ETW-1000)

Order

HK83E (ET-1000 Eng Trainer) £219.95
 HK84F (ETW-1000 Assembled) £369.95

Linear Circuits Course EH-701



- Build each circuit as you learn
- Deals with basic circuits and modifications
- Includes 86 parts for building over 30 linear circuits

Study and build a circuit "file" series

The concisely arranged explanations and diagrams in this course move smoothly into the hands-on experience you require, in logical progressive order. The course describes a circuit and how it operates, presents a complete schematic, and details several modifications. Bipolar transistors, field-effect transistors, the 555 timer, and 741 op-amp linear circuits are covered.

All the parts you'll need

To build various amplifiers, oscillators, astable and monostable multivibrators, pulse position and pulse width modulators, active filters and more are provided.

The Linear Circuits Course is time-efficient, economical

Because it's a Heathkit Self-Instruction course you set your own study hours, save money on equivalent college or technical school courses. Move quickly through concepts you understand right away; spend more time on those you have difficulty with. All circuits can be constructed and tested on your own breadboards.

Order

HK48C (EH-701 Linear Course) £54.95

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 GOVT. DEPT's, IF YOU
 NEED AN ACCOUNT...**

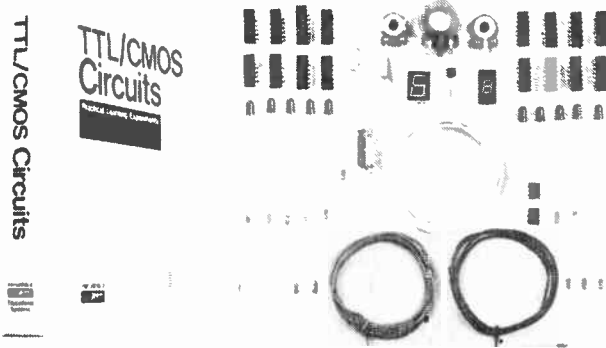
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TTL and CMOS Circuit Course EH-702

Laser Technology Course EE-110

NEW



- Completely covers subject
- Circuit "file" format
- Components provided
- Uses the natural, effective learn-by-doing approach

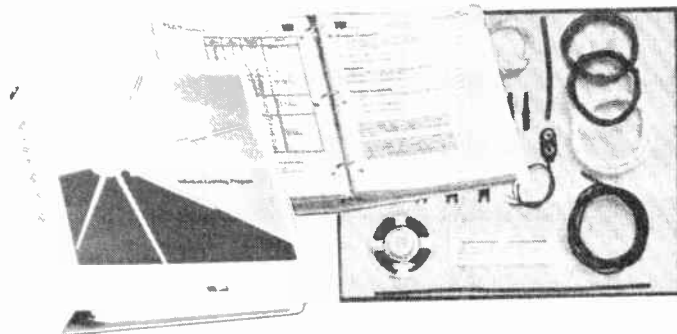
You'll be building circuits right away

Simply study the concise text and diagrams, then begin constructing circuits yourself. You'll develop your skills when it's convenient for you, at a comfortable pace. The modular format progresses logically through over 50 circuit types, including the 7447 BCD seven segment decoder, the D and J-K type edge triggered flip-flops, the four bit adder, the CMOS 100kHz crystal oscillator, and the quad bilateral switch. These state-of-the-art circuits can be built with your own breadboard and power supplies.

Order

HK49D (EH-702 TTL CMOS Crs) £59.95

Fibre-Optics Course EE-4201



- Covers theory, systems, and components of fibre optics in detail – along with hands-on practice applications
- Learn at your own pace, retain more with Heathkit proven programmed self-instructional text format

Managers, engineers, students and hobbyists will benefit

from this broad, in-depth introduction to the challenging science of lightwave technology. Fibre optics are an important, future shaping breakthrough in rapid signal transmission with cost performance benefits that promise to revolutionise the data communication world. Be prepared.

This five-unit course covers the basics of fibre optics.

Beginning with Unit 1 you'll study Optical Energy, the nature of light and optical radiation; Optical Fibres and how they transmit light; Fibre Optic Light sources — light emitting diodes and laser diodes. In Unit 4 you'll learn about fibre optic receivers and in Unit 5 you'll put it all together as you study complete fibre optic systems. Get valuable design experience by developing a two-way fibre optics link and related circuitry. Four optional hands-on experiments are included in the course to enhance your understanding of the text. To perform them, you will need either a Heathkit ET-3400 or ET-3200A Digital Techniques Trainer, an oscilloscope, a multimeter and common hand tools (not included).

Order

HK92A (EE-4201 Fibre Op Crs) £99.95

- The first hands-on training system to teach laser technology
- Includes mirrors, lenses, filter, cables and mounts
- 400 page self-instruction course



A Complete Training Package

Studies show that the laser industry is heralding a new frontier in industrial technology. Lasers are progressing as dynamically as computers have. They will very shortly become an essential component of industry and have a profound influence on everyone's life.

Applications in medicine, military surveillance, security, construction, optical arts and many other areas are making laser literacy a must. Now, the new Heathkit Laser Training System is the training solution for industry personnel, students, hobbyists and anyone interested in high technology. The first to offer hands-on experiments with a working laser.

The Laser Training System

Prepared by education experts, the system includes: a 400-page comprehensive text using proven teaching methods; a complete parts package with mirrors, lenses, filters, cables and mounts; and 15 fascinating experiments that integrate the learning process. No other laser training system provides such practical experience-based instruction.

The 'Laser Technology' Course provides thorough instruction on characteristics of laser light, the laser as a source of light, laser design, types, and components. Once a solid understanding of laser basics is attained, the individual concentrates on laser applications and safety. The individual's newly-gained knowledge is then reinforced by experiments which range from radiometric light measurements to data transmission.

A Hands-On Learning Experience

Course experiments and the laser trainer (described below) provide the individual with a first-hand look at rapidly advancing laser technology.

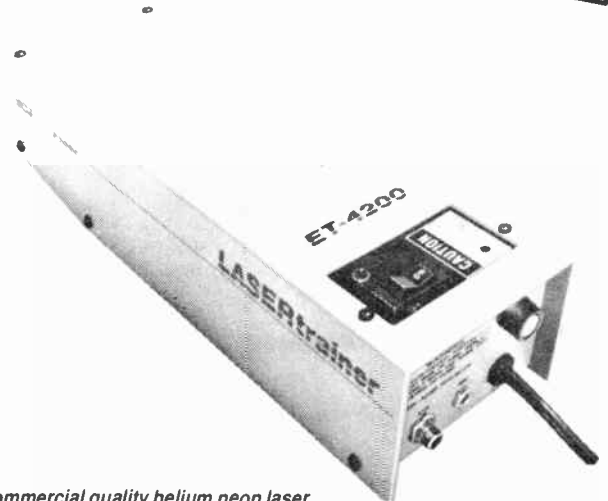
The Laser Training System truly offers the most complete program aimed at teaching the concepts behind one of the most exciting advancements of our time — the laser. Now is the time to forge ahead to the new frontier with the Laser Training System.

Order

HM27E (EE-110 Laser Course) £139.95

Laser Trainer ETS-4200

NEW



- Commercial quality helium neon laser
- Includes power supply, audio modulator and receiver

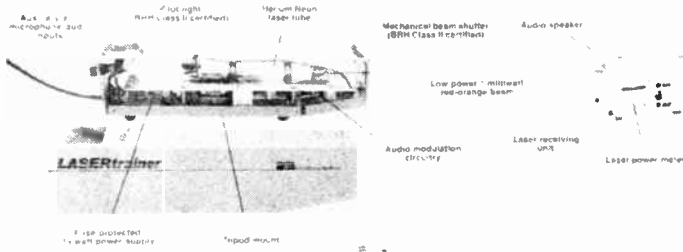
A Commercial Quality Laser

The laser trainer developed for use with the Laser Technology Course, is a low-power Class II Helium Neon type. It emits a less than 1 milliwatt beam in the red portion of the visible spectrum. It has a pilot light and mechanical beam shutter for extra safety. To ensure long life, nothing but commercial-grade components are used.

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Phone before 2pm for same day despatch.

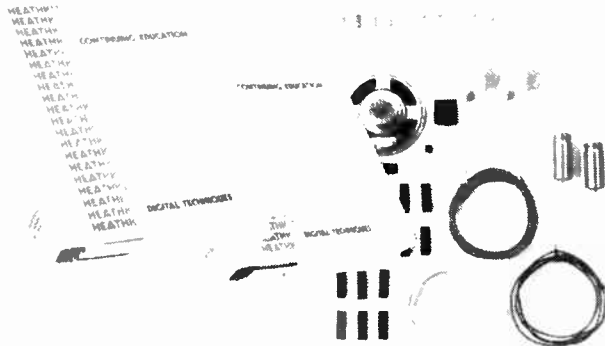


State-of-the-art modulation circuitry demonstrates communications technology. Plug in a microphone and transmit voice to a Laser Receiver unit that's included with the system. The Laser Receiver can reproduce speech through an audio speaker while a power meter indicates relative intensity of the beam.

Order

HM32K (ETS 4200 Laser Trnr) £344.95

Digital Techniques Course EE-3201



- Learn to design and apply modern digital circuitry
- Costs less than college or tech school course
- Loaded with 24 practical, hands-on experiments to reinforce the learning experience

Learn to design and apply modern digital circuitry

This advanced course is a comprehensive treatment of the subject beginning with fundamentals and theory and guiding you through digital logic circuits, Boolean algebra, flip-flops and registers, sequential logic circuits, combinational logic circuitry and digital design. As you complete each step-by-step section, hands-on experiments and tests will further aid your understanding of digital techniques. The course includes the text in two heavy-duty vinyl binders and electronic components for performing the experiments. The ET3200 Trainer described below is required to complete the experiments. A multimeter is also needed and an oscilloscope is recommended.

Order

HK12N (EE-3201 Dig Tech Crs) £99.95

CMOS Techniques Course EE-3202



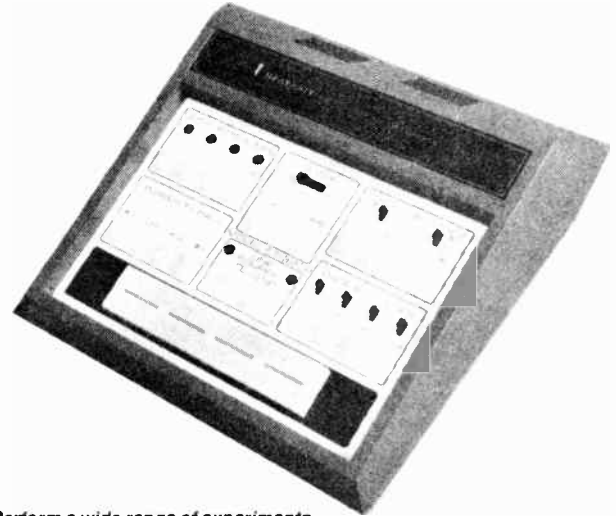
- Stresses practical applications and in-circuit advantages
- Learn to interface between CMOS and other logic families
- Learn by doing with proven teaching methods

Practicality makes CMOS (complementary metal-oxide-semiconductor) devices desirable; our practical course uses a learn-by-doing approach, with experiments that illustrate course topics — components included. Basic CMOS concepts through advanced applications are covered, including interfacing, logic blocks, multivibrators, counters and registers, and analogue applications. The ET-3200B Trainer is required to perform the experiments. A multimeter is also needed and an oscilloscope is required.

Order

HK64U (EE-3202 CMOS Tch Crs) £59.95

Digital Techniques Trainer ET-3200B



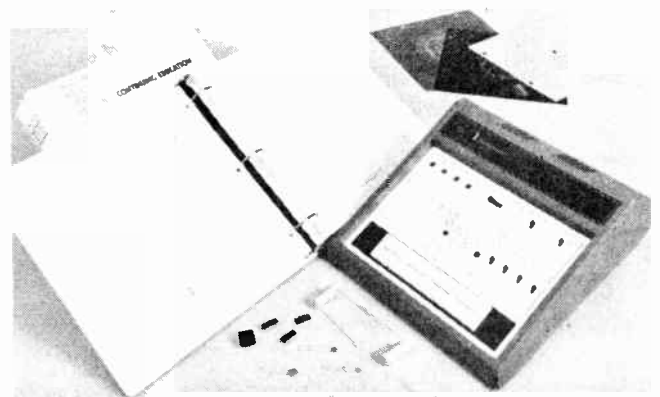
- Perform a wide range of experiments
- Increase your understanding of digital techniques
- Test your own digital circuits

This versatile trainer lets you put your digital knowledge to work and allows you to build and test prototypes, confirm circuit operation and test digital IC's. Solderless breadboard sockets make experimenting and design easier and faster with a flexible capacity for eight 14-pin or 16-pin dual-in-line IC's and 24-pin, 28-pin and 40-pin IC's. The trainer has four binary data switches to pulse logic circuits, a three frequency pulse clock generator and four LED's. The built-in regulated power supplies furnish +12V at 500mA, 12V at 100mA and +5V at 500mA. The trainer measures 308 x 298 x 89mm and is available in kit form or ready built (ETW-3200B).

Order

HK13P (ET-3200B Dig Trainer) £109.95
HK14Q (ETW-3200B Assembled) £179.95

Microprocessor Course EE-3401



- **COMPLETE:** Covers all the basics of microprocessors, microcomputers and programming — even includes hands-on hardware/memory interfacing and programming experiments
- **EFFICIENT:** Programmed-learning design and audio visual aids, combined with 19 hands-on experiments, mean you learn about microprocessors faster and more efficiently
- **PROVEN:** The Heathkit Microprocessor Self-Instruction Course has introduced thousands of people like you to microprocessors, microcomputers, interfacing and programming
- **ECONOMICAL:** Learn effectively for less

This superb introduction to microprocessors

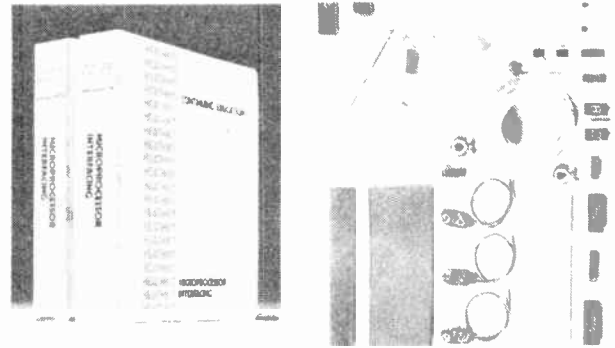
Won first prize from the International Award Society for Technical Communication. You will learn about microprocessors, microcomputers and computer programming in a complete efficient and well organised way. You'll understand microprocessor basics, computer arithmetic, programming and interfacing.

The course adopts the finest models of successful self-instruction techniques

With concise steady-paced textbooks and hardware experiments that make important microprocessor theory, application and design easier for you to understand.

The course is organised in ten learning units

Unit 1 covers decimal, binary, octal and hexadecimal numbering systems; conversions, binary codes and positional notation. Unit 2 teaches you terms and conventions, introduces you to several instructions and shows how programs are written and executed. Unit 3 covers binary addition, subtraction, multiplication and division, two's complement arithmetic and Boolean logical operators like NOT, AND, OR, Exclusive-OR and INVERT.



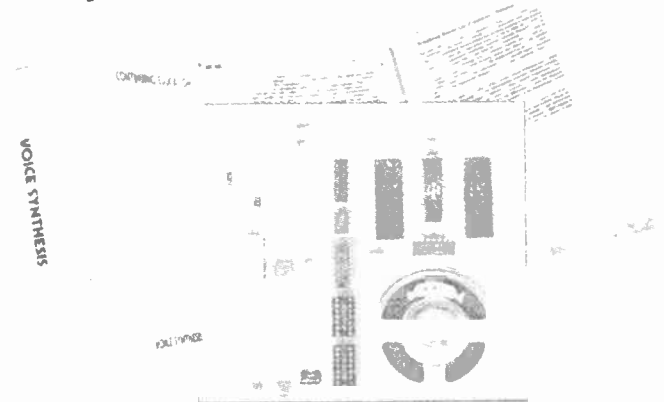
communications, peripheral devices, programmable timers and an in-depth discussion of the 6809 advanced microprocessor. The text is contained in two vinyl binders and the course comes complete with a variety of components required for the experiments. The trainer ET3400 is required to complete the experiments.

Order

HK16S (EE-3402 Intrfcng Crs)

£99.95

Voice Synthesis Course EE-3403



The fourth unit of the course

Is an introduction to programming including branching, conditional branching, algorithms and programming instructions. The 6800 microprocessor is covered in units 5 and 6 and includes a study of architecture, instruction set, addressing modes, stack operations, subroutines, input output operation and interrupts. In units 7 and 8 you'll learn the fundamentals of interfacing, interfacing random access memory (RAM), interfacing displays, interfacing with switches, the peripheral interface adaptor (PIA) and using the PIA.

You will write and experiment

With a wide variety of increasingly complex programs in unit 9. In experiments you will turn the ET-3400 trainer into a teaching machine that will give you drills and practice in computer numbering systems. You will use all instructions and addressing modes and experiment with subroutines, stack operations etc.

In the final unit you will use the electronic components supplied

With the course to convert the ET-3400 trainer into a digital clock, a musical instrument and a digital voltmeter. You will experiment with address decoding, PIA's, input and output of data, parallel-to-serial conversion techniques, digital-to-analogue and analogue-to-digital conversion techniques and interrupts. Units 7, 8 and 10 assume knowledge equivalent to the Digital Techniques Course whilst the remainder of the course requires no prior knowledge.

The course comes complete

With text, two binders and 62 electronic components including RAM's, a PIA chip, a digital-to-analogue converter, op-amps and a variety of other microprocessor orientated devices. The ET-3400 trainer is required to perform the experiments. With the computer age upon us, now is the time to begin your education in microcomputers and programming by ordering this tried and proven course today.

- Covers voice synthesis hardware and software
- Includes complete chip sets for digitised and phoneme voice synthesis
- Experiments in the text give hands-on experience

Get on speaking terms with your computer

The Heathkit Voice Synthesis Course teaches you this state-of-the-art technique in an easy-to-follow format with hands-on experiments that will have your ET-3400A Microprocessor Trainer talking to you in no time. This five unit course consists of a 250-page text filled with experiments in voice synthesis, along with the chip sets and other electronic components necessary to complete the experiments.

Covers two voice synthesis methods

The course teaches both digitised voice synthesis (fixed vocabulary with human voice qualities) and phoneme voice synthesis (which allows you to reproduce any English word and almost all pronounceable sounds).

Practical course features a great deal of experimentation

EE-3403 cuts through the technical fog and gets right down to how to program and interface the two most popular voice synthesis methods. The course is also valuable in helping you to understand the alternatives available in speech synthesis. It can be a real money-saver to a design engineer, for example, who wants to explore the wide range of capabilities and problems with various synthesisers.

Complete chip set for digitised and phoneme voice synthesis are included

1. The digitised chip set contains both a ROM chip and a synthesiser chip - featuring a vocabulary totalling more than 200 words.
2. The phoneme synthesiser is self-contained on a single chip.

Course covers subject completely

The five-unit text covers voice synthesis in a clear concise manner. You'll also learn about the basic hardware and software necessary for breadboarding computer-synthesised speech - and the programming and interfacing you'll need for both digitised and phoneme voice synthesis. And it prepares you to write machine code programs tailored for the ET-3400A Microprocessor Trainer. When you complete this course, you'll be able to make your Heathkit ET3400A Microprocessor Trainer (necessary for the course) talk.

Order

HK65V (EE-3403 Synth Course)

£69.95

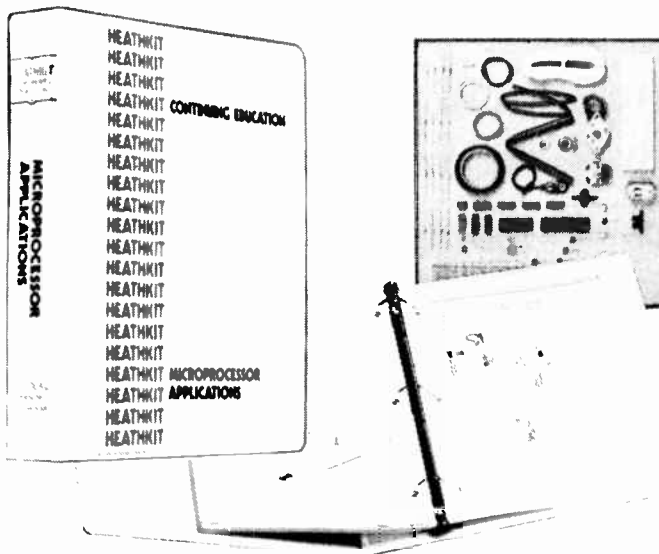
Interfacing Microprocessors Course EE-3402

- Add to your microprocessor knowledge with this course, which details interfacing techniques and concepts
- Begins where the EE-3401 Microprocessor Course ends - a logical continuation to your studies
- Provides in-depth coverage of the 6800 microprocessor family and introduces the powerful 68000

Beginning where the Microprocessor Course ended

These 750 pages of complete and detailed text contain eleven learning units and ten hands-on experiments to teach you the fundamentals of microprocessor interfacing. Topics covered include Advanced Peripheral Interface Adaptor and analogue conversion. Adaptor and analogue conversion, serial data

Microprocessor Applications Course EE-3405



- Over 820 pages including valuable index and device data sheets in two sturdy vinyl binders
- Puts previous knowledge of microprocessors to work quickly, as you apply them in 'real world' situations
- 55 components, including 10 IC's, are supplied for use with Trainer to complete 13 high-level experiments

Microprocessors are everywhere

The possible applications of microprocessors are almost endless and only limited by the imagination. Dedicated computer intelligence in such everyday items as cars, appliances, and toys is becoming commonplace, yet it is only a beginning. Because of the microprocessor, just about any electromechanical device is a candidate for computer control. The next few years will see increasingly widespread application of this technology.

How microprocessors can sense and control events

EE-3405 was written to help students bridge the gap between their daily analogue world and the digital world of the microprocessor. The fundamental methods of microprocessor programming and interfacing (presented in EE-3401 and EE-3402) to perform simple I/O tasks, are prerequisite to having a microprocessor actually sense, control and quantify 'real world' events, as outlined in this course. When you have mastered these various techniques, you will be well on the way to joining and taking an active part in the microprocessor applications revolution.

Covers most common applications

The course begins with a two-unit discussion of Digital-to-Analogue and Analogue-to-Digital Conversion. Units 3 and 4 cover Sensors, Transducers and Detectors. Unit 5 teaches the interfacing of electronic electrical Control Devices and Stepper Motors, such as those used in robotics. The application principles and microprocessor control of phase locked loops are presented in Unit 6.

Experiments in microprocessor control

The last text unit is titled 'Microprocessor Applications Present and Future', and was written to stimulate your imagination by examining several actual and possible microprocessor applications. Following that, 13 interesting experiments will demonstrate and re-inforce the most important text concepts in a clear, effective way. You will build and apply microprocessor control to a thermometer, photometer, programmable digital frequency synthesiser, position and velocity sensors, optical counters, stepper motor, voltage/frequency converters and more. To perform the experiments, you'll need the ET-3400AE Microprocessor trainer and an oscilloscope.

Order

HS59P (EE-3405 Micro Course) £99.95

Microprocessor Trainer ET-3400A

Functioning as a miniature digital computer

The ET-3400A Trainer is used with the experiments in the EE3401 2/3 and 4 courses. It features a built in 1K ROM monitor program for controlling unit operation. It also has a six-digit hexadecimal 7-segment LED display for address and data readouts, and monitoring internal logic states.

The 17-key hexadecimal keyboard

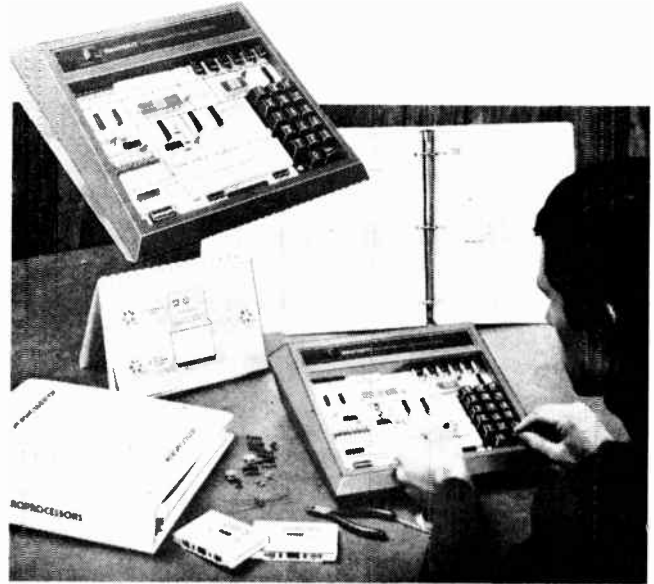
Permits you to access memory locations to examine contents, then step forward or backward to examine other memory locations, change the contents of memory locations, examine and/or alter any of the MC6808 microprocessor's internal registers, set break points for program debugging, or reset the MPU. The flexible instruction set of the MC6808 permits five addressing modes, and uses two accumulators, an index register and a stack pointer.

The ET-3400A has 512 bytes of Random Access Memory (RAM) built in

It also features 8 buffered binary Light Emitting Diodes (LED's) for display of breadboard logic states, 8 SPST DIP switches for binary input to breadboarding circuits, and a breadboarding socket for prototyping, memory and interfacing circuits.

All microprocessor address, control and data busses

Are terminated on the front panel for ease of connection to prototyped circuits. There's also provision for a 40-pin external connector to expand memory and I/O capacity. Built in +5, +12 and -12V DC power supplies provide internal power needs. Dimensions of the Heathkit ET-3400A Microprocessor Trainer are 8.89 x 30.99 x 29.85cm, without the ETA-3400 Trainer Accessory.



The programming and interfacing experiments

Supplied with the EE-3401 and EE-3402 courses are implemented on the ET-3400A. The trainer is a flexible general purpose training unit and microprocessor breadboard. Use it in other applications that require a low-cost, microprocessor-based software development system, or as a design aid for developing special interfaces. Team it up with the ETA-3400 Microprocessor Trainer Accessory for increased personal microcomputing power and versatility. Available in kit form or ready-built (ETW-3400A).

Order

HK18U (ET-3400A Micro Trnr)	£259.95
HK19V (ETW-3400A Assembled)	£359.95

Accessory For Microprocessor Trainer ETA-3400



When you add this accessory you turn your ET-3400A Trainer into a computer system

It provides you with more computing power — so you can run longer, more sophisticated programs through your ET-3400A Trainer. The Accessory's memory can even be expanded to 4K bytes of RAM by adding the optional ETA-3400-1 3K Chip Set.

A serial interface

With EIA and 20mA loop formats in the Accessory allows you to hook up a smart video terminal, or a 20mA ASCII teletype machine. It also provides a cassette interface enabling you to store programs on convenient cassettes. The ROM monitor/debugger program lets you implement the standard trainer monitor functions through the external terminal. Memory locations can be examined or changed, break points can be initiated, and program debugging can be accomplished with a single instruction step feature. A Tiny BASIC Interpreter in ROM lets you program in easy-to-learn BASIC language. User function lets you run machine code routines from BASIC — the same machine code routines you learnt in the EE-3401 Microprocessor course.

The ETA-3400 connects to the ET-3400A Trainer

By means of a 40-pin ribbon cable (supplied). Parts required to modify the Trainer are included. Since this modification changes the clock frequency of the Trainer, experiments in the EE-3401 and EE-3402 courses which use timing loops will be changed. It is recommended that all EE-3401 and EE-3402 experiments be completed before adding the Accessory. A video terminal is required to use BASIC and monitor software features of the ETA-3400. This unit is available in kit form or ready-built (EWA-3400).

Order

HK46A (ETA-3400 Accessory)	£179.95
HK91Y (EWA-3400 Assembled)	£359.95
HK47B (ETA-3400-1 Chip Set)	£54.95

Computer Fundamentals Course EC-2001 NEW

- First in a new Computer Servicing Series
- Gives a complete overview of a computer system
- Detailed look at the inside of a microcomputer

First in a New Series

The Computer Fundamentals Course introduces you to the modern computer. While the concepts discussed in this eight-unit Course can apply to computer systems of all sizes, the emphasis is placed on the microcomputer — the machine that has revolutionised the way we do things at the office, at school and at home.

Step-by-Step Introduction

This is a thorough step-by-step introduction to the world of microcomputers that begins with computer basics, applications and systems. You'll learn about power



supply sources for computers and the importance of keeping them noise-free. You'll become acquainted with 16 and 8-bit microprocessors, bussing and interfacing the central processing unit, different types of semiconductor memories plus bubble and electromagnetic memories, and input and output interfacing. You'll also learn about programming using high and low-level languages, assemblers, editors, compilers and interpreters. In addition, you'll learn the meaning of many frequently used terms associated with computers, equipment that can be connected to a computer and the software used in them.

Self-Paced Course

Computer Fundamentals is a self-paced learning program written in easy to understand terms. Review exercises and unit examinations help to track your progress and point out areas where extra study is needed.

Previous Knowledge Needed

A solid background in basic electronics and digital theory is needed to better understand the material presented in this Course. This knowledge is available in Heathkit's EE-3101A DC Electronics, EE-3102A AC Electronics, EE-3103A Semiconductor Devices, EE-3104A Electronic Circuits and EE-3201A Digital Techniques Courses.

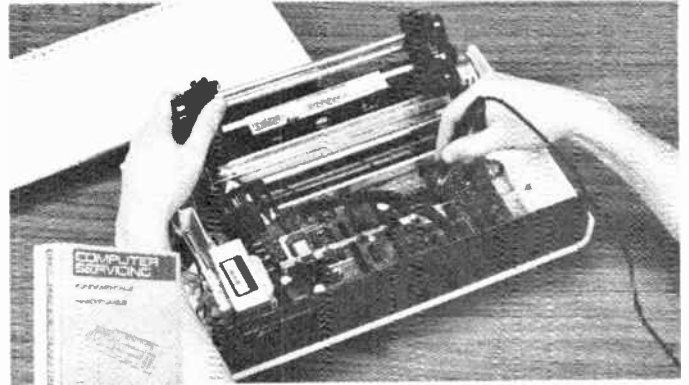
What You'll Need

To perform the hardware and software experiments at the end of each unit you'll need the ET-100 Microcomputer Trainer, a cassette recorder, a video monitor (or television receiver and RF modulator), a single-trace oscilloscope and a multimeter. A dot matrix printer is also helpful.

Order

HM15R (EC-2001 Cmpt Fndmnt)	£129.95
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Computer Peripherals Course EC-2002 NEW



- Learn about important peripheral devices such as printers, displays, disk drives, modems and many others
- Course covers both the internal and external operation of peripheral devices
- Perform experiments on the ET-100 Trainer, a 16-bit computer which is expandable to a powerful disk-based system

After you have mastered Computer Fundamentals you are ready for the Computer Peripherals Course. The second course in the Computer Servicing Series, the Peripherals Course builds on what you learned in Computer Fundamentals to introduce you to a multitude of peripheral devices.

Explore every aspect of peripheral devices including the purpose, capabilities and fundamental operation of each one and how they are interfaced to a mini or microcomputer. In addition, various input/output (I/O) standards used within and between computers and their peripherals are defined. Control and data flow of electronic and electro-mechanical devices are also discussed.

Seven units, including one on each category of peripheral devices provide a complete and well-organized tour of this important part of computer servicing. You'll start with an explanation of communication standards in serial, EIA and parallel data communications, and will also learn about non-standard interfaces. Next you move on to chapters dealing with the ins and outs of input devices, visual displays, printers and plotters, and memory peripherals. Data transmission and peripherals in computer control systems are also thoroughly discussed.

Interesting experiments provide real experience with the topics you read about. To perform the experiments you will need the ET-100 Microcomputer Trainer and its upgrade accessory, a cassette recorder and a video display. You will also need a volt-ohmmeter, and an oscilloscope. All other components are included with the course.

Proceed through the course at your own pace and check your progress with self-test review exercises and unit examinations. Then go back and review the areas in which you need more work.

To better understand the material and concepts which are presented in the Heathkit Zenith Computer Peripherals Course you should complete EC-2001 Computer Fundamentals Course.

Order

MD26D (Heathkit EC-2002)	£64.95
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Computer Maintenance Course EC-2003 NEW

- Learn valuable professional troubleshooting techniques for computer repair in addition to servicing basics
- Hands-on experiments let you learn to approach computer maintenance using problem solving methods.
- 21 Units provide you with detailed coverage on computer servicing and repair

Prepare for a career in one of the fastest growing job markets - computer repair and servicing. As computer systems are used in more homes, schools and offices, the need for computer service technicians also grows. You can be part of this wave of opportunity with training in computer servicing and repair. You don't have to be a programmer or system designer to maintain and repair computers. You just need to know the ins and outs of microprocessors, digital troubleshooting and other skills such as those you will learn in this course. The Computer Maintenance Course prepares you for the future with an overall approach to learning how to troubleshoot and maintain computer systems.

The third course in the Computer Servicing Series, Computer Maintenance starts with a review of TTL and MOS devices and then moves on to standard digital troubleshooting techniques. This includes determining the electrical characteristics of integrated circuit input and output pins, using a logic probe and logic pulser probe. You quickly get to apply what you have learned on a digital troubleshooting problem in Unit III.



Next, you are introduced to a typical microprocessor based computer system and will learn how each section of the system hardware interacts with the other sections. From here you learn how to troubleshoot each section and how to approach a malfunctioning system. Topics include; how to find the defective block of the system and how to apply classical troubleshooting techniques such as logic state analysis and signature analysis.

You even learn some of the new troubleshooting techniques in this up-to-date course. Explore new techniques such as static stimulus testing and use of a mobile I/O port. Finally, the course discusses system software diagnostics including how to write system diagnostics for a particular system.

Computer Maintenance leads you into the problem solving world of troubleshooting and maintaining computer systems with a simple step-by-step approach. Each unit builds on the preceding one to achieve optimum comprehension and understanding of each topic. You work at your own pace so that you can take time to master each concept before you go on to the next one. Review excises and unit examinations help you measure your progress and show you areas in which you need extra work.

Experiments provide you with practical experience in course concepts. To conduct these experiments you will need the ET-100 Trainer, an oscilloscope and a multimeter.

To better understand the material presented in Computer Maintenance you should complete DC Electronics, AC Electronics, Digital Techniques, and Computer Servicing - Fundamentals and Peripherals courses before beginning the Computer Maintenance Course.

Order

MD31J (Heathkit EC - 2003) £89.95

Complete training system

Heathkit introduces a truly remarkable dual learning package. The first half consists of an Advanced Microprocessors Course EE-8088. A comprehensive training course, it provides an in-depth study of 16-bit microprocessors and covers terms, architecture and programming. In addition, thorough coverage is given to interfacing the microprocessor to its support devices and to the outside world. The second half is a one-of-a-kind 16-bit training computer, the ET-100. Available separately the ET-100 supports the EE-8088 as a working computer-trainer. When the course is completed, the ET-100 can be used as a valuable learning tool, a low-cost engineering prototyping fixture, or a very powerful computer.

Future technology

Already being used to control some personal and small business computers, 16-bit microprocessors are expected to dominate the market place in the very near future. To help you keep up with this trend, the Advanced Microprocessors Course eases you into the world of 16-bit computing. It begins by acquainting you with microprocessor terms and then introduces assembly language. Progressing at your own speed, you then proceed through program writing, addressing modes, memory logic and control lines, and dynamic and static RAM. After completing the EE-8088 Course, you'll have acquired a solid background in 16-bit microprocessors.

Hands-on-learning

To bring your study material to life, the EE-8088 provides more than three hundred pages of experiments. These include experiments on software programming and hardware interfacing. Because its both a trainer and a computer, both types of experiments can be carried out on the ET-100 Trainer. Together the EE-8088 Advanced Microprocessor Course and ET-100 Trainer provide you with the knowledge and experience to master 16-bit microprocessors and computers.

Course materials

An easy to read self-instruction program, the EE-8088 consists of 100 pages of text divided into ten units. Units one to eight cover the subject material and units nine and ten contain experiments to be done following each completed unit. Included with the course are all the parts necessary for performing every end of unit experiment.

Course contents

Unit 1 examines microprocessors and introduces the 8088 microprocessor with instruction addressing modes. Unit 2 introduces machine and assembly language programming. Unit 3 shows conditional/unconditional loops and loop addressing plus sub-routines. Unit 4 details the instruction set of the 8088 along with a summary of its addressing modes. Unit 5 discusses memory segmentation. Unit 6 explains input/output operations, internal/external interrupts and string operations. Unit 7 describes the various MPU bus and control lines, typical address and data bus networks and data handling techniques. Unit 8 examines the memory system in detail and goes into the various forms of input/output interfacing. Units 9 and 10 contain programming and interfacing experiments. An appendix ends the Course with additional educational information including reviews and data sheets.

Order

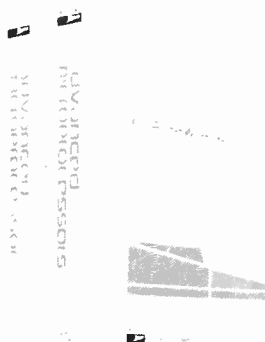
HK85G (EE - 8088 16 - Bit Cours) £99.95NV

16-Bit Computer Trainer ET-100



- Features the super-fast 16-bit 8088 microprocessor
- Comes with 16 kilobytes of RAM and can be expanded to 64 kilobytes
- Has a powerful software package on 32K of ROM which includes a CP/M assembler, screen editor and a debugger
- Has buffered access to all the 8088's address, data and control lines
- Permits solderless computer circuit building on its large breadboard
- Teaches basics of 16-bit microprocessing with EE-8088 course experiments

16-Bit Microprocessor Course EE-8088



- Learn to program and interface powerful and incredibly fast 16-bit microprocessors
- Gain an in-depth understanding of the 8088 microprocessor used in the HS100, IBM-PC, DEC Rainbow 100 and many others
- Reinforce your studies with experiments from the course that are designed to illustrate concepts learned in each unit
- Perform all experiments on the unique ET-100 Trainer that is actually a versatile, low-cost, cassette based, 16-bit computer
- Upgrade the Trainer into a disk based 16-bit computer system capable of running all Heathkit 16-bit software



16-bit computer

The ET-100 Advanced Microcomputer Trainer uses the same sophisticated 8088 microprocessor that's found in our HS-100 Desktop Computer. A powerful editor assembler and debugger are permanently stored in ROM for your own program writing and editing convenience. The ET-100 has its own cassette port for loading and storing programs and data. And its RS 232 Input/Output port can be used with a printer or other peripherals. A detached 95-key keyboard includes 16 function keys and a numeric keypad. It generates a full ASCII character set plus 33 graphic characters. The ET-100's video output can be displayed in twenty-four 80-character lines on a monitor.

Advanced trainer

For engineers, the ET-100 is ideal for breadboarding computer circuits that interface to the 8088 microprocessor. All control, data and address lines are readily available around the three solderless breadboards. Even the programmable parallel interface (PPI) is accessible. All access lines are buffered to protect the microprocessor from damage. The ET-100 allows experimenters and technicians to easily and conveniently modify circuits, build interfaces, or simply experiment with the 8088. Four power supply voltages separate from the main logic board for protection, are also available on the breadboard to power your projects. For moving your circuit to another location for testing or safekeeping, the top breadboard is removable so you can move the entire circuit without disassembling it. And to those students using the EE-8088 course the ET-100 teaches 16-bit microprocessor fundamentals through course experiments.

Order

HK86T (ET-100 16-Bit Trainer) £799.95

Accessory For 16-Bit Computer Trainer ETA-100

- Increases user RAM to 128K bytes that's expandable to 192K bytes
- Adds a separate programmable timer for timing internal events
- Provides two RS-232 serial ports and Centronics printer port
- Contains a floppy disk controller for 48 or 96 TPI 5 $\frac{1}{4}$ " drives
- Provides bit-mapped video capabilities that upgrades to colour
- Includes a 48 TPI disk drive with 320 kilobyte storage
- Includes MS-DOS Z-DOS software package

Powerful upgrade package

Turns your ET-100 Trainer into a powerful 16-bit disk-based computer that helps you with a variety of applications, such as data processing, telecommunications, networking and financial analysis. The ETA-100 package consists of two circuit boards, a boot ROM and an external disk drive unit. A dust cover is also included so that a monitor can be placed on top of the computer.

Big computer features

After installing the ETA-100 package your computer will gain many features found in powerful desktop computers. Features like, 128K bytes of RAM that can be expanded to 192k bytes with the addition of accessory Z-205-1. A programmable timer is included that's independent of the system clock. Two full RS232C serial ports permit communication with printers, modems and voice synthesisers.

Further features

With the addition of the floppy disk controller and 48 TPI disk drive the ETA-100 can store up to 320k bytes of data. And by adding a second 48 TPI drive with accessory Z-207-3 storage can be doubled to 640K bytes. The ETA-100 uses bit-mapped graphics where individual pixel dots are controlled for a 640 x 225 pixel high-resolution graphics display. For an eight colour display, add two Z-219-1 video RAM chip sets. Available in kit form or ready built (EWA-100).

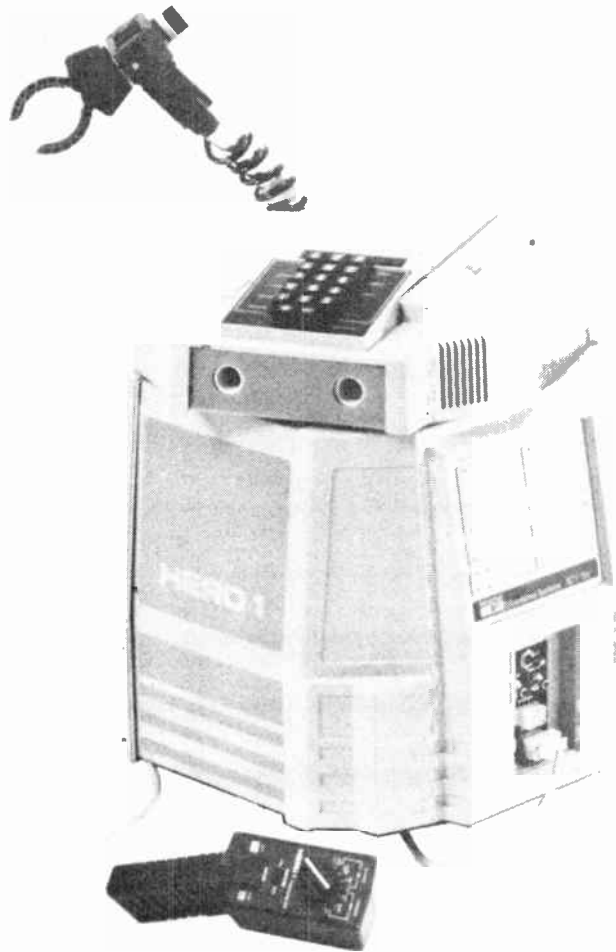
Order

HK87U (ETA-100 16-Bit Assmd)	£999.95
HK88V (Heathkit EWA-100)	£1650.00
HK97F (Z-205-1 64K RAM Kit)	£79.95
HK96E (Z-207-3 Disk Drive)	£250.00
HK98G (Z-219-1 Colour RAM)	£74.95

Hero 1 – The World's First Sophisticated Robot ETS-18

- Contains all the basic systems of today's industrial robots

HERO 1 is one of the most important microprocessor controlled devices ever conceived. It is the perfect robotics training system for industry and schools.



HERO 1 is a completely self-contained electromechanical robot capable of interacting with its environment. It can see, hear, speak, detect moving objects and determine their distance, pick up small objects, move in any direction and learn from your instructions!

Controlled by a programmable on-board computer HERO 1's 6808 microprocessor can guide the robot through various complex manoeuvres, activate the robot's sensors and modify the robot's behaviour in response to inputs from its on-board sensors and real-time clock. The straightforward programming process allows step-by-step debugging and other corrections, as needed.

HERO 1 can be programmed in three different ways. Through the keyboard mounted on the robot's head, with its hand-held remote control, teaching pendant or through its serial cassette port using a program previously stored on a conventional audio cassette tape recorder. The computer can store programs with over 1000 individual steps.

Use HERO 1 to guard your home or office. It could automatically detect intruders in its range and warn them away verbally. And HERO 1 can remain on guard for extended periods of time using its power-conserving "sleep" mode.

You can program HERO 1 to pick up small objects with its arm and gripper mechanism capable of seven axes of motion. The arm extends, retracts and turns, performing mechanical tasks with precision. The robot can also be programmed to speak complete sentences with its phoneme based speech synthesiser.

Expand HERO 1's capabilities to the limit of your skill and imagination with the on-board experimental breadboard. This board allows you to design circuits for interfacing with the robot's computer.

When HERO 1 tells you that its batteries need charging, simply plug in the external battery charger. HERO 1 can continue to be used whilst its batteries are charging.

Use HERO 1 with the robotics course described below. You'll quickly get a hands-on grasp of industrial electronics, mechanics, computer theory and programming as applied to robots by putting them into action.

Hero 1 is available in kit form or factory assembled. In kit form Hero 1 is available in its three separate parts or complete. The ready-assembled version is complete.

Exceptional Capabilities:

Convenient Control Panel: Control HERO 1 from the keyboard on his head. You can also use the remote teaching pendant, or a program written on cassette tape.

Experimenting Circuit Board included: HERO 1's breadboarding area provides direct access to an I/O port, user defined interrupt, CPU control lines and power.

HERO 1 Can See: The robot's light sensor beam can detect ambient light over the entire visible spectrum with excellent resolution — down to one part in 256.

HERO 1 can hear: The robot's omnidirectional sound sensor can hear ambient sounds from 200 to 5000 Hz, with the same one part in 256 resolution.

Detects still and moving objects: HERO 1's ultrasonic sensors can "see" movement up to 15 feet away and can determine the range of an object up to eight feet away.

HERO 1 can talk: With the phoneme Speech Synthesiser, the robot can simulate human speech — with four levels of inflection.

Highly manoeuvrable: HERO 1's three-wheel drive system with one wheel both driving and steering, allows the robot to move anywhere — and to turn in a 12 inch radius.

HERO 1's hand grips small objects: The gripper can hold up to half a kilo when fully retracted and horizontal — pivots up to 350 degrees.

Arm: Rotates up to 250 degrees, pivots wrist up to 180 degrees, extends or retracts gripper over a five inch track.

"Learn" mode lets you teach HERO 1: Just switch to "Learn" mode and take the robot through your task. It remembers — and repeats the steps at your command.

"Sleep" mode conserves power: This makes HERO 1 ideal for home and plant security duty — when it sees intruders it "wakes-up", and warns them away verbally.

Self-contained rechargeable batteries: Two separate power systems — one for the logic circuits and a second for the drive system. External charger is included.

World famous Heathkit manual: Easy to follow instructions from the world's largest builder of electronics kits guide you through each "kitbuilding" step.

Order

HK20W (ETS - 18 Hero 1 Robot)	£1199.95
HS80B (ETS - 18 Hero Assembled)	£1699.95
HS77J (Heathkit ET-18 Body)	£799.95
HS78K (Heathkit ET-18 - 1 Arm)	£349.95
HS79L (Heathkit ET-18 - 2 Vce)	£99.95

Accessories For Hero 1

Demo ROM ET-18-4

A plug-in ROM containing several routines demonstrating Hero 1's motor and sense circuit and voice synthesiser.

Order

HK89W (ET-18-4 Hero Dem ROM)	£49.95
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Monitor ROM Listing ET-18-5

A complete listing of Hero 1's monitor ROM.

Order

HK90X (ET-18-5 Mon ROM List)	£39.95NV
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Expansion RAM ET-18-6

An 8K x 8 random access memory chip which plugs into the Memory Expansion Board. Up to 5 of these chips may be installed which would increase Hero 1's RAM up to 44K bytes.

Order

HS66W (ETA-18-6 RAM Fr Hero)	£24.95
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Memory Expansion Board ETA-18-6

This board adds on to Hero 1's CPU board to provide sockets for up to 6 extra memory chips, RAM's or ROM's.

Order

KA13P (Hero Mem Bd ET-18-6)	£49.95
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Automatic Mode ROM ET-18-7

A plug-in ROM that enables Hero 1 to move independently around a room while avoiding obstacles.

Order

HS67X (Heathkit ET-18-7)	£29.95
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Basic For Hero 1 ET-18-9

A plug-in ROM that allows you to program Hero 1 in a simple integer BASIC with modifications that enable you to use the robot's voice synthesiser and its various motors and sensors. To use the BASIC, you will need the Memory Expansion Board, one or more Expansion RAM's and the RS232 Interface.

Order

HM26D (ET-18-9 Hero 1 Basic)	£59.95
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RS-232 Interface ET-18-10

Plugs into the top breadboard to provide a direct link between your computer and Hero 1 for serial communications.

Order

HS68Y (ETW-18-10 Hero 1 RS232)	£59.95
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Demo Cassette ET-18-11

Programs on cassette that demonstrate Hero 1's sensors and voice plus arm and body movements.

Order

KA12N (Hero Dem Cs ET-18-11)	£14.95
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Advanced Experiments with Hero 1 EB-1802

Over 60 challenging and fun experiments in programming Hero 1.

Order

HT53H (Expmts Hero EB-1802)	£24.95NV
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Robotics Course EE-1800

- Self-instruction text covers 1200 pages of robot basics
- Programmed self-study allows you to progress at your own rate
- Optional experiments provide you with hands-on experience when done on HERO 1 — the teaching robot

A 1200 page self-instruction text with 11 sections covering robotics from fundamentals. Optional experiments give you hands-on experience with the HERO 1 teaching robot.

Subject areas covered are:

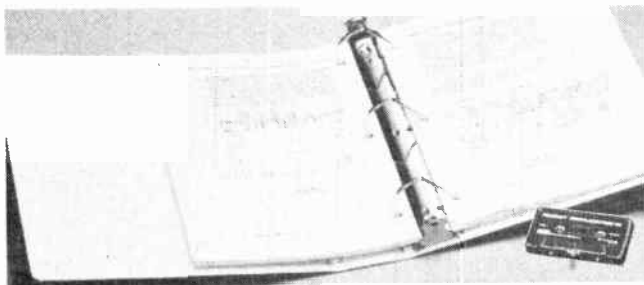
1. Robot fundamentals.
2. AC and fluidic power.
3. DC power and positioning.
4. Microprocessor fundamentals.
5. Robot programming.
6. Heathkit robot microprocessor.
7. Data acquisition (sensors).
8. Data handling and conversion.
9. Voice synthesis.
10. Interfacing.
11. Industrial robots at work.

The programmed self study materials guide the student, step-by-step, until important concepts are mastered. Self-test reviews at the end of each unit make sure you understand what you've studied, before moving on to the next unit. The course starts by categorising industrial robots and introducing some specific robot terms that are used throughout the course. Building on this, you'll learn how AC power is generated and how its used to run robots. The course continues on to show how DC batteries and motors give robots total freedom. Then you'll learn about basic microprocessor principles, followed by programming. Next, the course acquaints you with the microprocessor used in HERO 1 — the 6808 — and shows how it operates. The next unit details some of the methods a robot uses to sense its surroundings and how they are used to help navigate a path. After the sensors obtain information, the next unit shows how the information is converted to a form that is usable by the robot's computer. Continuing on, you'll learn how human speech is generated and then apply that knowledge to producing speech electronically. After becoming acquainted with all the systems that make up a robot, the next section ties these systems together to show how a robot performs a specific task. You'll complete your study of robotics with a look at the different types of robots used in industry and the type of work they perform. Using HERO 1 lets you apply what you've just learned and you get the type of reinforcement that makes learning-by-doing one of the most effective education methods ever devised. The course is also fully functional without the robot. You should have at least a basic knowledge of DC and AC electronics, digital techniques and basic microprocessors before starting the robotics course.

Order

HK21X (EE-1800 Robotics Crs) £99.95NV

Robot Applications Course EE-1812



- Continue your education in robot technology
- Uses Hero 1 to perform experiments including construction and use of an EPROM programmer
- Includes cassette with robot programs
- Step-by-step text builds up knowledge to keep you abreast of the changing robotics field

In the Robotics Applications course you'll learn the concepts and technologies that make advanced industrial robots a reality. You'll learn many of the factors that govern the selection of an industrial robot based on management and work-place environment conditions. Signal conditioning, the process of getting the signal from the sensor to the microprocessor controller, is covered in depth. A detailed study of sensor systems is reinforced by a number of experiments designed to give you hands-on experience with sensor systems. You will construct vision, tactile, and environmental feedback types of sensors. With the programs provided with this course, you will be able to understand both the capabilities as well as the limitations of today's robots.

Subjects covered are:—

1. Management considerations.
2. Environmental feedback.
3. Vision systems.
4. Tactile sensing.
5. Computer aided manufacturing (CAM).
6. Robot applications.

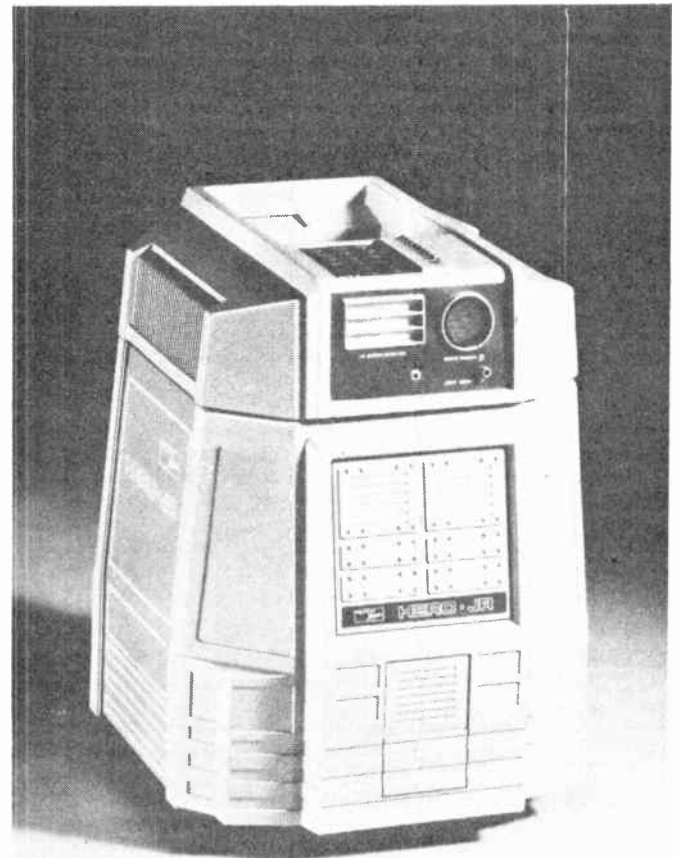
There are many self-test reviews during your study to reinforce the material in the lessons. Use these short quizzes to test your understanding of the material you've covered and as a guide to determine what areas, if any, in which you may need further study.

There are ten experiments included that are conducted on the versatile robotics and industrial electronics trainer, Hero 1. An audio tape supplied with the course contains several programs for Hero 1 which is used in carrying out the experiments. These are a hands-on opportunity to become acquainted with the concepts and technologies you have studied in the text. Experiments covered in the course are:— A smoke detection/vocal warning system, a heat sensor, a controller memories/EPROM burner, stationary home security robot, mobile intrusion alarm and a mobile home security robot. All components needed to successfully complete the experiments (including a programmable ROM) are included with the course. For a fuller understanding of the material in this course the completion of the EE-1800 course is highly recommended.

Order

HS58N (EE-1812 Robot Course) £99.95

Hero Jr. — Personal Robot RT-1



- Adopt Hero Jr. as a new member of the family
- He is the first affordable, fully pre-programmed personal robot

Hero Jr. Is a real friend and companion

Hero Jr., unlike other robots, requires no programming skills to operate. The first real "companion robot," Hero Jr. has a number of unique preprogrammed activities which shape his "personality." He roams, explores, sings songs, recites poetry, and speaks English and his native "Roblish," a robot's version of English. He will wake you up in the morning, guard your home with a coded security system, and even play games. "Hero Jr. is the first robot with a built-in personality. He's sentimental, sophisticated and at times a real ham." says Wayne Wilson, Product Manager, General Consumer Products, at Heathkit. Hero Jr. wakes up his owners with a personalized alarm and can sense whether or not they awaken. Friend and companion that he is, Hero Jr. permits a 10-minute snooze.

Hero Jr. will stick by you

Hero Jr. is programmed to greet his companions with such phrases as "I am Hero Jr., your personal robot," and "I am your friend, companion and security guard." In addition, an internal 100-year clock permits Hero Jr. to remind his owner of the day of the week, date and time...and it even corrects itself twice a year for Summer Time. Once familiar with all facets of Hero Jr.'s personality, the owner may advance to the level of "Robot Wizard" which permits Hero Jr. to identify the owner by name and much more. Hero Jr. even uses his senses to seek out his owners while moving about. The robot's ability to locate humans can be enhanced with the optional infra-red motion detector.

Security guard and fun companion

Hero Jr. guards your home against intruders when the security mode is selected by issuing a verbal warning and requesting a password. Included with this accessory are two window stickers that read "WARNING: THIS AREA IS PROTECTED BY A SECURITY ROBOT." Hero Jr. enjoys playing games including "Cowboys and Robots," "Let's Count" and "Tickle Robot." Additional cartridges that expand his operation are also available. These cartridges teach, play games and add to his repertoire of phrases and songs.



Sing-along-a-Hero

Hero Jr. is pre-programmed to sing "Daisy" and "America the Beautiful." The accessory cartridges enable him to sing other songs too. A built-in demo program allows Hero Jr. to show off his many talents in a "Robot Variety Show" in which he demonstrates the numerous personable tasks he can perform. A battery accessory doubles Hero Jr.'s operational time, which is normally 4-6 hours. The batteries recharge overnight from a plug-in wall charger. Hero Jr., the first fully pre-programmed personal robot, has an unprecedented 32K of built-in robot routines. He can speak English and "Roblish" (a robot's version of English), play games, explore, and act as an alarm clock and security guard. Accessories such as the infra-red motion detector enhance the robot's ability to seek out humans, and a wireless remote control permits Hero Jr. to be operated manually.

Exterior

Hero Jr. is 48.3cm tall, weighs 9.75kg and resembles Heath's first robot, Hero 1, which is designed to teach Robotics and Industrial Electronics. Hero Jr.'s three wheels, including a single articulated rear drive wheel, enable him to move about and avoid obstacles. He can carry up to 4.5kg on a 1540cc compartment built into the top of his head. An optional cartridge slot is located in the back of this tray. His head is also equipped with a 17-key keypad which permits the owner to modify Hero Jr.'s personality or initiate a special task. Eight data LED's flash in time with his speech or to signal something special. A window for optional infra-red motion detection, an ultrasonic Polaroid sonar transceiver, and a light sensor compose Hero Jr.'s face. Other transducers provide synthesised speech output and sound sensing. Connectors on the back of Hero Jr.'s head include a charger jack, an on-off slide switch, sleep switch and an optional RS-232 computer interface. Hero Jr. can be recharged overnight from a plug-in wall charger which comes with the robot. Hero Jr. will operate from 4-6 hours between charges under normal operating conditions.

Sensors

For sound sensing, Hero Jr. uses a 256 bit resolution sound sensor with adjustable range and a 200-5000Hz bandwidth. He uses a 256 bit resolution light sensor with adjustable range and a 25-degree reception angle. His ultrasonic sonar is designed to accurately measure distance from four inches to about 25 feet. Hero Jr.'s standard motion detection sensor also uses his ultrasonic sonar. However, Hero Jr.'s optional six-field infra-red sensor provides superior heat/motion detection capability and improves his ability to seek out humans.



Hero Jr.'s speech synthesis equipment includes a Votrax SC-01, with four pitch levels and 64 phonemes, which permits Hero Jr. to say just about anything. Hero Jr.'s time apparatus consists of a CMOS processor which includes a clock with a 100-year calendar and automatic correction for Summer Time. An optional RS-232 computer interface also allows Hero Jr. to accept an assembler or load and dump from memory. A "Hero Jr. Basic" cartridge permits programming through the RS-232 interface.

Accessories

An infra-red motion detector helps Hero Jr. locate humans and improves operation of the security mode and some of his games. Cartridges can be added to expand Hero Jr.'s repertoire of routines, songs, games and phrases. And, an extra battery accessory doubles his operating time.

Software

Hero Jr.'s software operation consists of a pre-programmed or built-in personality, which requires no user input. The user may shape Hero Jr.'s personality by increasing or decreasing the priorities of each of six personality traits, or the user may select any individual task or demonstration mode separately. The software program includes four special task commands. SET UP is for changing Hero Jr.'s personality. GUARD commands him to protect a specific area or to act as a security device while moving about. ALARM commands him to wake up his owner at a designated time. PLAN permits you to set Hero Jr. for a future activity such as reminding you of a birthday or anniversary. The software performs true multi-tasking, which enables Hero Jr. to move and speak at the same time. Hero Jr.'s normal mode allows him to explore at random, avoid obstacles and seek out humans.

Electronic Specifications

Hero Jr. uses a Motorola 6808 microprocessor. He has 32K of monitor ROM, 8K RAM and an on-board provision for up to 16K additional RAM or ROM for future expansion plus provision for 4K and 8K plug-in ROM cartridges. Hero Jr.'s three circuit boards include a microprocessor, power supply/sense, and keyboard. He



comes with two Motorola 6821 parallel interface adaptors and a Motorola 146818 CMOS clock. He uses a 180-degree rotation, stepper type motor for steering, and a 12V DC motor for drive. One idler wheel features optical chopper feedback to detect distance travelled. His alphanumeric keypad features clearly marked function keys including Sing, Play, Poet, Gab, Alarm, Guard, Help, Demo, Plan, Set Up and Enter.

Power Supply

Hero Jr. uses two six-volt, rechargeable lead-acid gelled-electrolyte batteries. Two optional cells double his operating time. A 12-volt wall charger plug provides full recharge overnight while Hero Jr. is in the sleep mode.

Hero Jr. has a personality

Every attempt has been made to make Hero Jr. take on human characteristics. The result is that Hero Jr. is the first robot with a dynamic personality. Hero Jr.'s personality consists of six "traits." These are:

- Sing songs
- Speaks English phrases
- Plays games
- Explores his environment, seeks out humans
- Gabs in his own language, "Roblisch"
- Tells nursery rhymes and poems.

Hero Jr. is the first completely pre-programmed robot. As soon as he is turned on, he will randomly select one or more of these traits and act out his personality. What Hero Jr. will do next will be a complete surprise...another humanlike characteristic. NO OTHER ROBOT CAN DO THIS.



You can change Hero Jr.'s personality

There are thousands of unique personalities that can be created by merely pushing a button. Called the "set-up key," this switch produces a voice prompt, or menu, that presents each personality trait and asks the owner to set a level of activity from zero to nine for each trait. For example, to prepare for a party, the owner can alter Hero Jr.'s personality so he will do very little exploring but a lot of singing and playing games. Plug-in cartridges give Hero Jr. even more capability. There are quite a few cartridges for Hero Jr. For example:

- Maths master
- Songs, Phrases and Rhymes # 1
- Animals, Blackjack, Tic Tac Toe
- Riddle Robot, Tongue Twister
- Special occasions: sings "Happy Birthday," "Auld Lang Syne"
- Musical Chairs, Acey-Ducey, Robot Mind Reader
- Herobics Exercises offers 4 levels of difficulty and 10 exercises the whole family can benefit from.
- Hero Jr. BASIC: allows the owner to program additional personality through a home computer.
- Hero Jr. Program Language allows you to program the robot through its keyboard.

Easy operation via the keypad

The keypad permits the owner to change Hero Jr.'s personality. The keypad also allows the owner to get Hero Jr.'s attention and request a specific task:

- Sing a specific song
- Say a specific phrase such as the current date and time
- Play a specific game
- Perform a "demo" of his capabilities
- Set the wake-up alarm
- Act as a security guard
- Plan a future event or reminder
- Also, the "HELP" key activates an audio menu that will help the owner set activities.

He has an unlimited vocabulary. His voice synthesiser can closely duplicate all English sounds. He can even speak phrases of most foreign languages. There is a Hero BASIC cartridge that allows the owner to program Hero Jr. through a terminal or home computer, via the optional RS-232 interface. This version of BASIC contains special enhancements for speech, movement and other traits.

Physical Description

- 48.3cm high, weighs 9.75kg
- 3 wheels. One rear wheel steers and drives
- 2 rechargeable batteries. Recharger included
- Built-in tray carries up to 4.5kg.

Sensors

- Sound: 200 to 5000Hz bandwidth
- Light: 30-degree reception angle
- Ultrasonic Sonar: Judges precise distances from 10cm to about 7.5m
- Motion Detection, Standard: uses ultrasonic sonar
- Motion Detection, Optional: uses infra-red motion sensor
- Time: uses CMOS clock with 100 year calendar. Compensates for Summer Time

Personality Traits/Capabilities

NOTE: These traits are available standard, when Hero Jr. comes "out of the box." No programming needed. Additional games, songs, etc., available through optional cartridges.

- Sings songs: "America The Beautiful", "Daisy"
- Speaks English phrases: 18 various phrases
- Plays games: Cowboys & Robots, Let's Count Hand Claps, Tickle Robot
- Explore: Moves about, using sensors to avoid obstacles. Like a pet, will try to stay in company of humans
- Gab: Speaks random voice phonemes that sound like English
- Poet: Tells nursery rhymes from memory
- Wake-up alarm: Awakens human at selected time, listens to be sure he is awake. Permits two 10 minute snoozes
- Self Demo: Demonstrates sensors and speech to owner's friends. Shows Hero Jr.'s capabilities
- Security Guard: Will guard specific area or room using sensitive motion detector. If intrusion is detected, shouts warning, demands password and appropriate action

The infra-red motion detector accessory is sold with two stickers that read "WARNING: THIS AREA IS PROTECTED BY A SECURITY ROBOT". Hero Jr. is available as a kit or ready-assembled. The assembled and kit versions include the RS-232 interface and cartridge socket. Both kit and assembled versions include a pair of batteries, user's manual and programmer's guide.

Order

KA00A (Hero Jr Kit RTR-1-1)	£499.95
KA01B (Hero Jr Asbid RTW-1C)	£749.95

Accessories For Hero Jr.

Infra-red Motion Detector RTA-1-1

Although Hero Jr. is equipped with an ultrasonic motion detector, this six-field infra-red sensor provides superior heat/motion detection capability and improves his ability to seek out humans.

Order

KA02C (IR Motion Kit RTA1-1)	£119.95
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RS-232 Interface RTA-1-3

Permits connection to your home computer and is required if you wish to use Hero Jr. BASIC. This accessory is included in the ready-assembled and kit version.

Order

KA03D (Jr RS232 RTA-1-3)	£49.95
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Extra Battery Pair RTA-1-4

When added, Hero Jr.'s operating time between charges doubles from 4 to 6 hours up to 8 to 12.

Order

KA05F (Jr Extra Bat RTA-1-4)	£59.95
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Cartridge Adaptor RTA-1-5

When fitted, the adaptor allows the pre-programmed cartridges to be plugged in. This accessory is included in the ready-assembled and kit version.

Order

KA04E (Jr Cart Adpt RTA-1-5) £49.95

Cartridges RTC-1

The following cartridges, which plug into the RTA-1-5 accessory, are available.

RTC-1-2	Songs, rhymes and phrases No.1
RTC-1-3	Animal, blackjack, tic-tac-toe
RTC-1-4	Special occasions
RTC-1-5	Maths master
RTC-1-6	Riddles tongue-twisters
RTC-1-8	Hero Jr BASIC
RTC-1-9	Herobics exercises
RTC-1-10	Hero Jr program language
RTC-1-11	Musical chairs, acey-ducey, robot mind-reader

Order

KA06G	(Jr Songs 1 RTC 1-2)	£19.95
KA07H	(Jr Animal RTC-1-3)	£39.95
KA08J	(Jr Occasions RTC-1-4)	£19.95
KA09K	(Jr Maths RTC-1-5)	£24.95
KA10L	(Jr Riddles RTC-1-6)	£24.95
KA11M	(Jr BASIC RTC-1-8)	£49.95
MD36P	(Herobics Cartridge)	£54.95
HM20W	(RTC-1-10 Jr Programr)	£49.95
HM21X	(RTC-1-11 Jr Msci Chr)	£43.50

Microcomputing Course EC-1000

- Learn about microcomputer fundamentals and the elements of BASIC language programming
- See how a computer can be used to solve your problems and then choose the right computer system for you
- Learn how to choose the right kind of software you need
- Written in simple and easy to understand terms.



For those who want to know what a computer can do for them, this Microcomputing Course is an ideal place to start. In easy and simple terms, you are shown what a computer can do for you. The self-instruction text fully explains the different parts of a computer and shows you how to apply its capabilities to your specific needs. With the text and two accompanying audio cassette tapes, you'll learn about computer hardware and how it works to better evaluate what extras you'll need along with your computer. You will learn about software and how to choose the best programs for your use. In this course, you will even write short programs using the popular BASIC programming language. The purpose of this course is to make personal computing understandable so that you can make informed decisions about a computer purchase.

Order

HP03D (Heathkit EC-1000) £49.95NV

Learn BASIC EC-1100

- Learn one of the most popular programming languages for the microcomputer — BASIC
- Easily write your own BASIC language computer programs for home or business use

Because its so easy to use

BASIC (Beginners All-Purpose Symbolic Instructional Code) is one of the most popular programming languages available for microcomputer systems. And now through effective, inexpensive self-instructional methods you can learn how to use this versatile language to your maximum benefit. As always, you proceed at your own pace, step-by-step until you're familiar with all aspects of the subject at hand. You'll learn the standardised words and commands in BASIC along with the tools of the language — numbers, statements, functions, loops, arrays and strings.

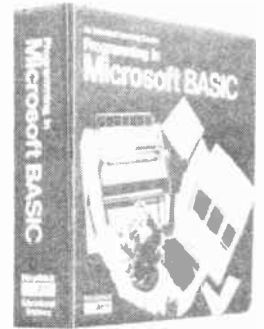


Learn to define and plan a program, format and write it, and adapt programs to suit your needs. Experiments give you hands-on experience in writing and running BASIC programs — for full benefits, use of a computer is recommended. In addition to your programmed instruction text and workbook, you'll receive handy reference cards with BASIC statements, ASCII number codes, BASIC direct command statements and a reference chart for math and Boolean algebra operations. When you're done with this course, you'll be able to write BASIC language computer programs.

Order

HM08J (EC-1100 Learn BASIC) £49.95NV

Microsoft BASIC Course EC-1110



- Learn to write and modify computer programs using this popular version of BASIC
- Audio-tutorial course uses experiments to give you hands-on programming experience

Microsoft BASIC is one of the most versatile languages available for microcomputers. If you use MBASIC on your TRS-80 or Apple computer, this 800 page course will show you how to get the most from this language. The 12-unit course covers every aspect of Microsoft BASIC programming. Unit 1 is an introduction to Computers and Programming. Covering computers, programs, data, the computer system and programming languages.

Immediate Mode, Unit 2 discusses arithmetic in BASIC, numeric variables, intrinsic functions and strings. Sequences and branching and loops are covered in Unit 3, Program Structures. Unit 4 has more about Decisions and Loops — including relational operators, counter-driven loops and nested loops.

Data structures — including one-dimensional arrays, N-dimensional loops and string records — are taught in Unit 5. User-defined functions and subroutines are covered in Unit 6, Subprograms. Unit 7 discusses Complex Structures — such as logical operators, multiple branching and structured programming.

The last five units cover operations and extensions available on disk versions of MBASIC. Major Language Extensions, Unit 8 teaches program editing; data type extensions, extended functions, operators and statements. Sequential Disk Operations, unit 9 covers program storage, program retrieval and sequential data files. Unit 10, Random Access Disk operation, covers random access buffers and fields — as well as storage and retrieval of numeric data. Error Trapping and Memory Conservation are the topics of Unit 11. Optimisation and Machine interfacing are covered in the final unit.

The audio-tutorial course utilises a specially written text and three audio cassettes which work together for effective learning and greater retention. Experiments provide extensive hands-on programming practice.

Self-test reviews let you check progress at specified points in the course. The features of the Microsoft MBASIC Interpreter are included except for the TRON.TROFF debugging utility.

Upon completion you will be able to write MBASIC programs that instruct a computer to perform specific tasks (sorting, organising and more).

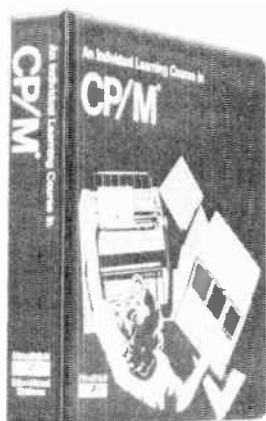
Order

HM09K (EC-1110 M-soft BASIC) £99.95NV



BIG CAT
HIGH POWER
LOUDSPEAKERS
for the BIG sound

CP/M-80 Course EC-1120



- Use with any 8080, 8085 or Z80 microcomputer which runs the CP/M-80 Disk Operating System
- Self-instructional course covers all aspects of the CP/M-80 Operating System in complete detail
- Effective audio visual teaching method

CP/M-80 is the industry standard disk operating system

And now with the Heathkit CP/M-80 Operating System Course, even the first-time computer users can quickly and easily learn it.

With the CP/M-80 Course, you learn at your own pace

No prior background or knowledge of Assembly Language is assumed or required. You start with the basics, and then build upon fact after fact until you're an expert. You'll think you have your very own tutor right in the room with you. The Heathkit CP/M-80 Course consists of a 500-page self-instruction text and five audio cassettes. In ten units, it covers CP/M-80 2.2 and earlier versions including built-in and transient commands.

You begin with an introduction to CP/M-80 Operating system, Unit 1

In unit 2, Typing CP/M Commands, you'll cover the writing of basic CP/M commands — including the operating system's major control functions — and diagnosing problems from CP/M's error messages. In Unit 3 you learn Built-in Commands, while Unit 4 discusses CP/M's Transient Programs. STAT and CONFIGUR Commands are covered in Unit 5. In Unit 6 you learn how to use PIP, CP/M's versatile file transfer program, while Unit 7 introduces you to the operating system's resident text editor, ED. Units 8 and 9 expand on ED's capabilities, with the Editing of Existing Files covered in Unit 8 and Advanced ED Functions outlined in Unit 9. The last unit of the course discusses Submitting Command Files. Upon completion you'll be able to operate CP/M-80 based applications programs as well as use ED to create and manipulate text files.

Compatible hardware and software

The CP/M-80 Course is designed for use with a computer system with 48K bytes of RAM and the CP/M-80 Operating System. To gain full benefits, we also recommend using a printer.

Order

HM07H (EC-1120 CP/M 80 Crs) £59.95NV

Assembly Language Course EC-1108



- Learn to communicate with your computer in a convenient low-level language
- Learn to write faster, more efficient computer programs with Assembly Language
- Clear text illustrates Assembly programming for better understanding of material
- Self-instruction course allows you to learn material at your own speed

Assembly Language

Lets you do anything on a computer that can be done in other languages. Assembly Language lies between the high level languages like BASIC and FORTRAN and machine language which is the basic 1's and 0's that a computer understands. It uses labels, operands, comments and assembler directives. This allows you to create a source code that is easily read and adapted to your computer system. Using a mnemonic for every machine operation. Assembly language programs require less memory space & run faster as time isn't wasted interpreting commands.

Efficient memory use

Assembly Language's shorter, more clearly defined codes allow you to store more data in less space. And execute programs faster — 10 to 100 times faster than if the same program were written in the popular interpreted BASIC. Symbolic notation (memory locations represented by figures) and easy to carry out documentation methods make program listings easy to understand.

Course contents

In the Assembly Language Course, you'll learn about flow-charting, device polling, code conversions, masking subroutines, the 8080 instruction set, input/output routines and precision math. Reinforcing the programmed instruction text is a well-illustrated workbook. The workbook provides hands-on experience in Assembly Language programming which requires you to use a computer. In addition the course includes a special Reference Chart that lists all 244 Assembly Language instructions as well as a complete ASCII code chart.

Course objectives

After completing this course and its workbook, you'll be able to program your own computer in Assembly Language. To perform the optional experiments in the course workbook you must have access to a computer. The Assembly Language Course is specifically designed for 8080/8085 based microcomputers that use standard Intel mnemonics. The Assembly Language learned in this course can be used with Heathkit HS-100 computers.

Order

HM06G (EC-1108 Ass Lng Crs) £54.95NV

Pascal Programming Course EC-1111



- Pascal is the ideal language for beginning and experienced users
- Pascal is sophisticated, structured, efficient, powerful, easy to use

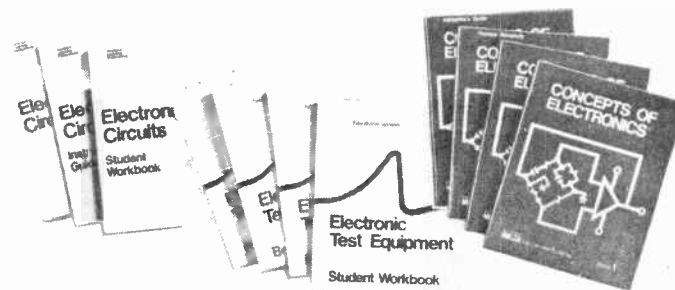
Whether you're an experienced user or just a beginner, this programming course can teach you to write programs in the high-level language of Pascal. Our audio-tutorial format shows you how to program in this powerful modular language with quick results. And, programming experiments provide experience. A clearly written text and five audio cassette tapes combine to form an integrated and effective learning program. You are shown how to identify and write simple Pascal programs. Then you learn to identify and write self-contained procedures. Other areas covered include: the decision making part of programming; how and when to incorporate IF, THEN, ELSE, and CASE statements; Boolean variables; and how to use REPEAT, UNTIL, WHILE, DO and FOR loops.

Further coverage consists of: data types and how to declare them; the use of arrays and character strings; procedures; the need of records and sets; the differences between pointers, linked lists, stacks, queues, binary trees and statements; and a description of sequential files and standard Pascal files.

Order

HP05F (Heathkit EC-1111) £99.95NV

CLASSROOM TRAINING COURSES

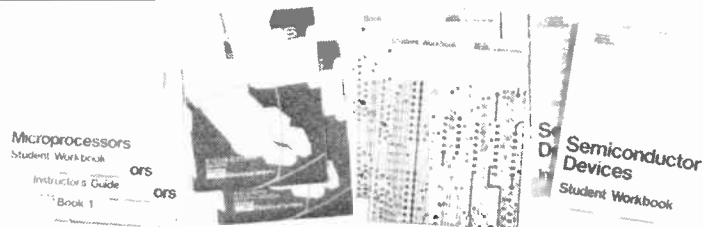


Most of the self-instructional courses described in the last few pages are available in a redesigned format for use in the classroom. Each course is a complete training package with student text; student workbooks; a fully detailed instructors guide with suggestions for making the course more effective; trainers in fully assembled or kit form; parts kits for hands-on experiments; and unit review and final examinations included in the guides. For some of the courses audio-visual accessories are available consisting of an additional illustrated booklet and two audio cassettes. The various course components are available separately so that they are suitable for use with any number of students.

Ideal for use in industrial training schools, colleges, universities and further education, these application orientated courses have just the right amount of

theory with a maximum emphasis on real-world applications of the theory learned. The student text is the core of the learning material, supported by a workbook with exams and experiments keyed to the text. The instructor's guide lets the teacher add his or her experience and guidance, providing each student with a fully rounded learning experience.

The following is a list of the state-of-the-art courses available. Please note that on some items delivery will take 4 to 6 weeks. A detailed description of the course may be found in the description of the self-instructional format version.



Course	Text	Workbook	Instructor's Guide	Audio-Visual Accessory	Assembled Trainer*	Parts	For description see
Concepts of Electronics	EB-6140	EB-6140-40	EB-6140-50	Not used	ETW-3100B	EB6140-30	EE-3140
DC Electronics	EB-6101	EB-6101-40	EB-6101-50	EEA-3101A	ETW-3100B	EB-6101-30	EE-3101A
AC Electronics	EB-6102	EB-6102-40	EB-6102-50	EEA-3102A	ETW-3100B	EB-6102-30	EE-3102A
Semiconductor Devices	EB-6103	EB-6103-40	EB-6103-50	EEA-3103A	ETW-3100B	EB-6103-30	EE-3103A
Electronic Circuits	EB-6104	EB-6104-40	EB-6104-50	EEA-3104A	ETW-3100B	EB-6104-30	EE-3104A
Test Equipment	EB-6105	EB-6105-40	EB-6105-50	EEA-3105A	ETW-3100B	EB-6105-30	EE-3105A
Communications	EB-6106	EB-6106-40	EB-6106-50	EEA-3106A	ETW-3100B	EB-6106-30	EE-3106A
Digital Techniques	EB-6201	EB-6201-40	EB-6201-50	EEA-3201A†	ETW-3200B	EB-6201-30	EE-3201
Passive Circuit Design	EB-6001	EB-6001-40	EB-6001-50	Not used	ETW-1000	EB-6001-30	EE-1001
Transistor Circuit Design	EB-6002	EB-6002-40	EB-6002-50	Not used	ETW-1000	EB-6002-30	EE-1002
Analogue Circuit Design	EB-6003	EB-6003-40	EB-6003-50	Not used	ETW-1000	EB-6003-30	EE-1003
Microprocessors	EB-6401	EB-6401-40	EB-6401-50	Not used	ETW-3400A	EB-6401-30	EE-3401
Interfacing Microprocessors	EB-6402	EB-6402-40	EB-6402-50	Not used	ETW-3400A	EB-6402-30	EE-3402
Microprocessor Applications	EB-6405	EB-6405-40	EB-6405-50	Not used	ETW-3400A	EB-6405-30	EE-3405
Computer Fundamentals	EB-2001	EB-2001-40	EB-2001-50	Not used	ET-100†	EB-2001-30	EC-2001
Computer Peripherals	EB-2002	EB-2002-40	EB-2002-50	Not used	ET-100†	EB-2002-30	EC-2002
Computer Maintenance	EB-2003	EB-2003-40	EB-2003-50	Not used	ET-100†	EB-2003-30	EC-2003
16-bit Microprocessors	EB-8088	EB-8088-40	EB-8088-50	Not used	ET-100†	EB-8088-30	EE-8088
Laser Technology	EB-610	EB-610-40	EB-610-50	Not used	ETS-4200†	EB-610-30	EE-110
Robotics	EB-1801	EB-1801-40	EB-1801-50	Not used	ETW-18	EB-1801-30	EE-1800
Robot Applications	EB-1812	EB-1812-40	EB-1812-50	Not used	ETW-18	EB-1812-30	EE-1812
Basic Programming	EB-6100	EB-6100-40	EB-6100-50	Not used	Not used	Not used	EC-1100

* Trainers also available in kit form (see previous pages). † Available in kit form only. ‡ Cassettes only.

Order

HM11M (EB-6140 C of E Text)	£27.95NV	HM56L (EB-6401 Micro Text)	£28.95NV
HM12N (EB-6140-40 C E Wkbk)	£13.95NV	HM57M (EB-6401-40 Micro Wbk)	£14.95NV
HM13P (EB6140-50 C E Instr)	£13.95NV	HM58N (EB6401-50 Micro Inst)	£12.95NV
HM14Q (EB-6140-30 C E Parts)	£35.95	HM59P (EB-6401-30 Micro Prt)	£79.95
HM16S (EB-6101 DC Elec Text)	£23.95NV	HM61R (EB-6402 Intface Text)	£28.95NV
HM17T (EB-6101-40 DC Wkbk)	£14.95NV	HM62S (EB-6402-40 Intf Wkbk)	£13.95NV
HM18U (EB6101-50 DC Instr)	£12.95NV	HM63T (EB6402-50 Intf Instr)	£12.95NV
HD55K (Heathkit EEA-3101A)	£24.95	HM64U (EB-6402-30 Intf Part)	£79.95
HM19V (EB-6101-30 DC Parts)	£28.95	HM67X (EB-8088 16-Bit Text)	£28.95NV
HM22Y (EB-6102 AC Elec Text)	£23.95NV	HM77J (EB8088-40 16-Bit Wbk)	£15.95NV
HM23A (EB-6102-40 AC Wkbk)	£14.95NV	HM78K (EB8088-50 16-Bit Ins)	£12.95NV
HM24B (EB6102-50 AC Instr)	£12.95NV	HM79L (EB-8088-30 16-Bit Pt)	£79.95
HD58N (Heathkit EEA-3102A)	£24.95	HS73Q (Heathkit EB-6405)	£23.95NV
HM25C (EB-6102-30 AC Parts)	£20.95NV	HS74R (Heathkit EB-6405-40)	£14.95NV
HM28F (EB-6103 Semicnd Text)	£23.95NV	HS75S (Heathkit EB-6405-50)	£13.95NV
HM29G (EB-6103-40 Semi Wkbk)	£14.95NV	HS76H (Heathkit EB-6405-30)	£64.95
HM30H (EB6103-50 Semi Instr)	£12.95NV	HM81C (EB-1801 Robotic Text)	£33.95NV
HD61R (Heathkit EEA-3103A)	£24.95	HM82D (EB1801-40 Robot Wkbk)	£18.95NV
HM31J (EB-6103-30 Semi Part)	£23.95	HM83E (EB1801-50 Robot Inst)	£12.95NV
HM34M (EB-6104 Elc Cir Text)	£23.95NV	HM84F (EB-1801-30 Robot Prt)	£59.95
HM35Q (EB-6104-40 Elec Wkbk)	£14.95NV	HS69A (Heathkit EB-1812)	£25.95NV
HM36P (EB6104-50 Elec Instr)	£12.95NV	HS70M (Heathkit EB-1812-40)	£15.95NV
HD65V (Heathkit EEA-3104A)	£24.95	HS71N (Heathkit EB-1812-50)	£13.95NV
HM37S (EB-6104-30 Elec Part)	£41.95	HS72P (Heathkit EB-1812-30)	£64.95
HM40T (EB-6105 Test Eq Text)	£23.95NV	HM71N (EB-6100 BASIC Text)	£21.95NV
HM41U (EB-6105-40 Test Wkbk)	£14.95NV	HM72P (EB6100-40 BASIC Wkbk)	£14.95NV
HM42V (EB6105-50 Test Instr)	£12.95NV	HM73Q (EB6100-50 BASIC Inst)	£12.95NV
HD67X (Heathkit EEA-3105A)	£29.95	MD32K (Heathkit EB-6003)	£28.95NV
HM43W (EB-6105-30 Test Part)	£35.95	MD33L (Heathkit EB-6003-40)	£17.95NV
HM46A (EB-6106 Commun Text)	£21.95NV	MD34M (Heathkit EB-6003-50)	£14.95NV
HM47B (EB-6106-40 Comm Wkbk)	£13.95NV	MD35Q (Heathkit EB-6003-30)	£27.95
HM48C (EB6106-50 Comm Instr)	£12.95NV	HE11M (Heathkit EB-601)	£22.95NV
HD68Y (Heathkit EEA-3106A)	£24.95	MD41U (Heathkit EB-610-40)	£17.95NV
HM49D (EB-6106-30 Comm Part)	£41.95	HE12N (Heathkit EB-601-50)	£12.95NV
HM52G (EB-6201 Digital Text)	£27.95NV	HE13P (Heathkit EB-601-30)	£34.95
HM53H (EB-6201-40 Digi Wkbk)	£15.95NV	MD18U (Heathkit EB-2001)	£34.95NV
HM54J (EB6201-50 Digi Instr)	£12.95NV	MD19V (Heathkit EB-2001-40)	£17.95NV
HD70M (Heathkit EEA-3201)	£25.95	MD20W (Heathkit EB-2001-50)	£14.95NV
HM55K (EB-6201-30 Digi Part)	£41.95	MD21X (Heathkit EB-2001-30)	£39.95
HS23A (Heathkit EB-6001)	£19.95NV	MD22Y (Heathkit EB-2002)	£34.95NV
HS24B (Heathkit EB-6001-40)	£13.95NV	MD23A (Heathkit EB-2002-40)	£17.95NV
HS25C (Heathkit EB-6001-50)	£10.95NV	MD24B (Heathkit EB-2002-50)	£14.95NV
HS26D (Heathkit EB-6001-30)	£15.95	MD25C (Heathkit EB-2002-30)	£39.95
HS27E (Heathkit EB-6002)	£20.95NV	MD27E (Heathkit EB-2003)	£34.95NV
HS28F (Heathkit EB-6002-40)	£13.95NV	MD28F (Heathkit EB-2003-40)	£17.95NV
HS29G (Heathkit EB-6002-50)	£10.95NV	MD29G (Heathkit EB-2003-50)	£14.95NV
HS30H (Heathkit EB-6002-30)	£24.95	MD30H (Heathkit EB-2003-30)	£39.95

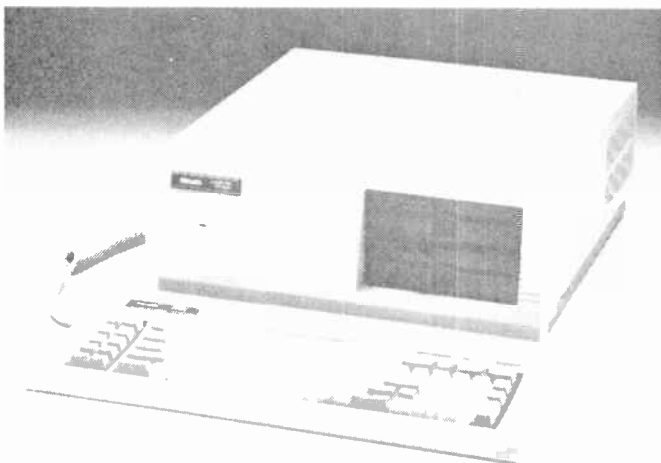
COMPUTER KITS

Personal Computer Kits With IBM Compatibility



Desktop HS-151-21/22

- A kit computer with enhanced features that takes advantage of IBM software and hardware
- Standard 128K memory capacity expandable to 320K on the motherboard and to 640K via expansion slot
- Available with one or two 5.25 inch floppy disk drives or optional Winchester hard disk drive
- MS-DOS operating system included at no extra charge



Heathkit proudly offers a new and exciting personal computer

The HS-151 Desktop Personal Computer...with the enhanced features that you are looking for. A quality personal computer, the HS-151 PC provides Heathkit excellence in design and workmanship along with access to the wealth of available IBM software and hardware.

Advanced 16-bit 8088 microprocessor

Using the advanced 16-bit 8088 microprocessor, the HS-151 PC gains a great deal of high speed computing power along with the ability to run sophisticated and high quality 16-bit software. In addition, the 8088 supports the MS-DOS operating system. This allows you to select software from the full range of applications software developed for the IBM Personal Computer and run it on the Desktop PC.

128K byte RAM standard

A standard 128 kilobytes (KB) of RAM user memory, with internal parity checking, is provided. For larger programs where additional memory is needed or desired, 64KB increments can be added to the main memory board for up to 320KB of RAM. A very useful debugger is permanently stored in ROM along with a pre-set auto-boot routine which can be disabled.

Floppy disk drives

Optional single or dual 5.25-inch floppy disk drives supply the HS-151 PC with high-capacity auxiliary storage. These double-density drives are IBM formatted

and each stores up to 360KB of data. An optional hard disk drive provides an extensive 10.6 megabytes (MB) of added storage.

IBM compatible expansion slots

Four open IBM compatible slots are provided for your future expansion. Use one of these slots to expand memory up to 640 kilobytes, or use one for a Winchester controller card, or both. By being able to accept most peripheral boards designed for the IBM-PC, the HS-151 PC provides unlimited off-the-shelf flexibility in hardware configurations. With more hardware choices available, you can choose from a wider variety of software programs and peripherals.

Full colour or monochrome video outputs

Two video outputs on the rear panel of the Desktop PC provide connections for either a colour or monochrome video display monitor. Connect an RGB monitor to the standard nine-pin D connector and enjoy the benefits of a full colour presentation. In the character mode, see a colourful 80-character by 25-line display in a selectable one of eight background colours and 1 of 16 foreground colours. In the graphics mode, each pixel of a 320 x 200 area can be painted in one of four colours selected from 1 of 2 colour palettes. For easier viewing of word processing and accounting programs, a standard phono type connector allows the use of monochrome display monitors. On a monochrome monitor, colour displays are represented by a corresponding grey level.

Detached high quality keyboard

A detached low-profile keyboard adds to the HS-151 Personal Computer's ease of use. The user-friendly keyboard is clearly labelled and has colour-coded keypads that permit rapid key identification. It is laid out in the standard typewriter format. Ten programmable function keys, and separate plus and minus keys increase the HS-151 PC's accurate data entry capability. A calculator-style keypad, with entry key, allows rapid entry of large groups of numbers. LED indicators on the keyboard give instant operating status notice at a glance. An audible click is sounded at each keypress to signal successful key entry. This lightweight keyboard connects to the main unit by coiled cord that expands up to six feet and plastic legs swing out for two levels of keyboard adjustment.



Parallel and RS232 ports

Two communication ports provide the HS-151 PC with the flexibility to expand. Available are an IBM compatible serial port and a parallel port that can be used with peripherals such as a matrix or letter quality printer or a modem. The serial I/O port is a standard EIA RS-232 DTE connector capable of baud rates between 110 and 9600 operating in asynchronous full or half duplex. The parallel interface is a Centronics compatible printer port using a 25 pin D connector.

Easy to use diagnostics for data security

Three separate testing procedures allow you to check your Desktop PC's hardware accuracy and adds to your data entry protection. These three levels of diagnostics include: power-on checks with their results indicated on eight internal LED's; a ROM-based user-implemented screen diagnostic; and, optionally, an extensive disk-based set of diagnostics. The diagnostic floppy disk is included with the HS-151 PC and provides an easy and broad range of diagnostic tests.

Powerful on-screen editor

Many editing capabilities are provided with the HS-151 Desktop PC to aid you in your program writing. With the HS-151, you can insert and delete characters and lines; erase a line; erase to the beginning of a line, to the end of line, or to the end of the page. Control the cursor with up, down, left, right, and home controls. Scroll through your programs with options such as jump or smooth scroll, or a scroll that's ROM or software selected.

Filled with important extras

The HS-151 PC lets you enjoy using a computer. Enjoy such features as a ready-to-use computer three to four seconds after applying power, easy hardware configuration with a menu-driven program, booting from any drive, smooth scroll search, flickerless video and much more. In the office or in the home, the HS-151 Desktop Personal Computer is ready to provide even more ways to help you be more productive and creative. One way is with the MS-DOS operating system that's included with the computer. It'll start you on the way to using the many software packages that are available for IBM PC's. An all-metal chassis with decorative bezels blends strength and superior styling into the HS-151 PC. Operates on 120/240 volts AC at 50/60Hz.

Specifications:

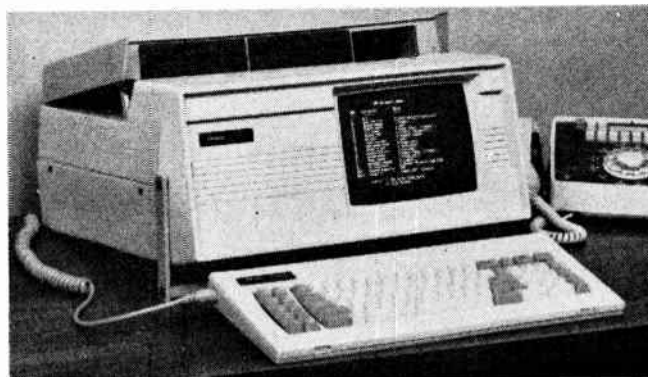
Processor: Intel 16-bit 8088. Clock: 4.77MHz. On-Board Memory: 128KB standard expandable to 320KB on main board up to 640KB total memory via expansion slot. VIDEO DISPLAY: CRT (HS-161 only): Non-glare 9-inch diagonal, amber phosphor. Display Format: 25 lines of 80 characters. Display Size: 12.7cm high x 17.8cm wide. Character Size: 4.22mm high x 1.9mm wide. Character Type: 8 x 8 dot matrix. Dot Resolution: 640 horizontal x 200 vertical. Colours: Characters: 1 of 8 background colours with 1 of 16 foreground colours. Graphics: Each pixel can be 1 of 4 colours selected from 1 of 2 colour palettes. Grey Scale: Eight levels on a monochrome display. Video Outputs: RGB with intensity control and composite monochrome. Cursor: Blinking underline or reverse video or off. Cursor Controls: Up, down, left, right, home. Cursor Addressing: Relative and direct. Tab: 8 columns. Refresh Rate: 60Hz, 50Hz. Edit Functions: Insert and delete characters or lines. Erase Functions: Erase line, erase to beginning of line, erase to end of line, erase to end of page. Bell: Audible alarm in receipt of ASCII BEL command. BUS STRUCTURE: Type: IBM compatible. Slots: 8, 4 available for expansion. KEYBOARD: Type: 84 keys, 57 alphanumeric and 10 special function plus 17 keypad keys including separate numeric keypad. Key Click: Yes. DISK SYSTEM: Drives: Single or dual 5.25-inch double-sided double-density 48TPI floppy disk drive. Capacity: IBM formatted for 360KB each. Winchester Drive: Optional internal 5.25-inch rigid disk drive and single 5.25-inch floppy disk drive. Capacity: 12.76MB unformatted, 10.68MB formatted. INPUT/OUTPUT: Serial I/O: One DTE RS-232C port. Baud Rate: 110-9600. Operation: Asynchronous full or half duplex. Parallel I/O: Centronics compatible. Power Supply: 120/240, 50/60Hz, 300 watts (maximum). Dimensions: HS-151: (40.6 x 15.9 x 42cm). HS-161: (20.9 x 49.5 x 48.6cm). Weight: HS-151: Approximately 19kg with keyboard and two disk drives. HS-161: 17.7kg.

Order

HT55K (Heathkit HS-151-21)	£1599.95
HT56L (Heathkit HS-151-22)	£1899.95

*MS is a registered trade mark of Microsoft Inc.

Portable HSA-161-21/22



- **Designed for a computer user to be more productive wherever or whenever the need arises**
- **Takes advantage of off-the-shelf IBM compatible hardware and software**
- **Combines compatibility, unique capabilities and features with improved performance and ease of use**

For those who need portability

Heathkit introduces the HS-161 Portable Personal Computer. It does everything a personal computer can do, perhaps a bit more, and it can do it while you're travelling. Designed-in are Heathkit quality and performance with the added plus of IBM compatibility. Move it from the office, to meetings, to the hotel room, and to your home. Use the computer at your convenience and be able to take advantage of virtually all IBM programs and hardware without changing any computer hardware. With the HS-161 PC, you get problem-solving power, portability and flexibility...a powerful combination.

Extensive memory and storage capacity

A standard 128 kilobytes (KB) of RAM is available on all models which can be expanded on the main board to 320KB. For auxiliary storage, the portable computer is available with one or two high capacity 5.25-inch floppy disk drives. Each drive stores data in the standard IBM format on double-sided, double-density disks for a total capacity of 360KB. When not in use or during transit, the disk drive section can be lowered into the computer.

For future expansion

Four open slots are available for almost any off-the-shelf IBM compatible accessory boards. This allows you access to hundreds of software and hardware alternatives to meet your ever-changing computer needs.

Built-in monitor

A 9-inch amber phosphor video display monitor is built into the HS-161 PC with full business graphics capability. The amber monitor is most preferred by users for easy-on-the-eyes viewing during long periods of use. A "grey scale" feature allows colour intensities to be programmed for easier viewing of colour programs on a monochrome screen. As an option, an RGB colour monitor can be used with the portable for a more exciting graphics display.

Detached 84-key Keyboard

A detached 84-key keyboard connects to the main unit by a coiled cable. This allows the user to locate the keyboard at a convenient working position. The keyboard is laid out like a standard typewriter. Keypads are clearly marked and colour coded for easy identification. Ten programmable function keys can be user defined for special software applications. Separate plus and minus keys and an L-shaped return key increase the portable's ease of operation. LED indicators, for caps lock and numeric lock, give instant notice of operating status. When moved, the keyboard safely locks into the front of the computer.

Utilize the two input/output ports of the HS-161

And expand the usefulness of this portable computer. A parallel port and an IBM compatible serial port are available on the rear panel for use with dot matrix or letter quality printers, modems and other computer expanding peripherals.

Protection for your data input

Protect your data entries by using three separate testing procedures to check the HS-161 Portable's hardware accuracy. One test is automatically conducted when the portable computer is powered up. Eight internal LED's indicate the results of the test. Access the ROM or monitor diagnostic which is displayed on the CRT. Or, use the diagnostic disk that's included with the computer.

Use standard software

Your access to a wealth of software, is another plus feature of the HS161 Portable Computer. Included with the HS-161 PC is the powerful MS-DOS operating system that allows you to use all the applications software developed for the IBM-PC.

Specifications:

See HS-151 Specification in previous column.

Order

HT64U (Heathkit HSA-161-21)	£1899.95
HT65V (Heathkit HSA-161-22)	£2249.95

PHONE NOW
0702 552911

Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

64K RAM Expansion Z-205-1

For HS-151/161 computers, adds 64K RAM. Each set consists of a nine chip set that installs on the main board for expanding the RAM memory. Up to three sets can be installed to give the 320K main board limit.

Order

HK97F (Z-205-1 64K RAM Kit) £79.95

128K Memory Expansion Board H-305

Once the main board memory of the HS151/161 computers is up to 320K, an additional 128K board may be added which simply plugs into one of the four expansion slots. Up to three Z-205-1 could then be added to this board to give the maximum 640K RAM.

Order

HT60Q (Heathkit H-305) £149.95

Winchester Upgrade Kit HS-317-10/20

A 10 or 20M byte upgrade kit which may be added to the HS151/161-21 computers in the spare second disk drive slot. The kits include a controller board, hard disk drive, instruction and mounting hardware. Once fitted, the drives provide an additional 10 or 20M bytes of memory.

Order

HT63T (Heathkit HS-317-10) £1699.95

MD44X (Heathkit HS-317-20) £1999.95

Numeric Co-Processor Z-316

8087 Numeric Co-Processor significantly improves the performance of HS-151 Personal Computers and HS-161 Portable PCs in arithmetic-intensive activities.

Order

HT61R (Heathkit Z-316) £284.95

Bit-Mapped Colour Video Graphics Upgrade ZSS-100-27

Assembled Bit-Mapped Video Graphics Card provides a high-resolution, 8-colour, 640 x 225 pixel display (640 x 512 interlaced) of both alphanumeric characters and graphics. Includes an enhancement to MS-DOS.

Order

MD39N (ZSS-100-27 Vid Upgrd) £595.95

Second Serial Port HCA-150-4

All the hardware you need to install a second serial port into the HS151/161 computers.

Order

MD37S (Second Serial Port) £74.95

Programmer's Reference Manual TM-150

This manual provides information about the features of the HS151/161 computers as related to programming and interfacing.

Order

MD38R (Reference Manl TM-150) £44.95 NV

Teach Yourself MS-DOS on your IBM-PC EC-1121

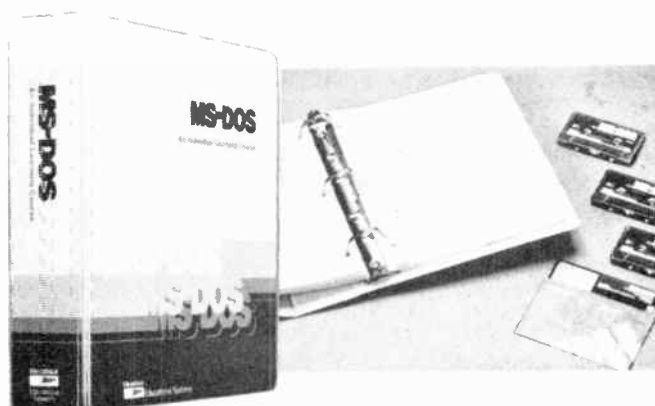
- Teaches MS-DOS in general and Z-DOS specifically, using exercises for the HS100 series computers operating under Z-DOS
- Learn as you go with programs for your HS100 or IBM-PC
- Teaches the structure of MS-DOS with exercises in command use
- Complete coverage with how to access system routines to do console input/output and work with disk files
- Full section narration guides you through the course in everyday language even a beginner can understand

Comprehensive Course

In seven units, the course teaches how MS-DOS is organised and all about how to use it. Directed toward the novice computer user, this course of study provides instruction in all the built-in commands and in the typical transient utilities. It will also provide an understanding of what assembly language is and how to use the system routines and the program debugger.

Course Description

Concerning MS-DOS in general and Z-DOS specifically, this course begins with a disk operating system background and explains how the disk itself is organised. Then the most often used commands are discussed along with how to enter and edit command lines. Examined next are the frequently used CHKDSK, FILCOM,



RDCMP and MAP commands. This is followed by a study of the file editor, EDLIN, including all its features. The program debugger, DEBUG, is then explained. The final unit teaches system interfacing through assembly language. Also shown is how to input and output characters and strings, to read and write disk files and to use directory entries within programs.

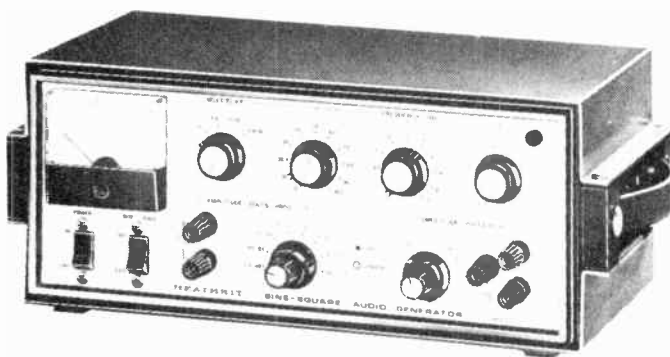
Full Section Narration

Accompanying the MS-DOS course are three audio cassette tapes which introduce each section, and guide the user through the course. In everyday language these cassettes help to provide fuller understanding of how a computer operates. Fifteen computer exercises provide experience in using MS-DOS features and commands with the HS100 and the IBM Personal Computer. Includes 5¼ inch floppy disk.

Order

HS65V (Heathkit EC-1121) £69.95 NV

TEST INSTRUMENT KITS Sine-Square Wave Audio Generator IG-5218



This superb instrument is ideal for gain and frequency response measurements in audio amplifiers, as a signal source for harmonic distortion measurements or as an external modulator for RF signal generators. A meter calibrated in both volts and dB, monitors the sine wave output.

Specifications:

- Sine wave output
- Frequency range: 1Hz to 100kHz
- Output voltage: 8 ranges 3mV to 10V rms (up to 1V there is 600Ω internal load).
- dB ranges: -62dB to +22dB, -12dB to +2dB on meter, -50dB to +20dB in 8x10dB switch positions, +2dB max into 6Ω load
- Output variation: ±1dB from 10Hz to 100kHz
- Output indication: Two voltage scales and one dB scale on front panel meter
- Output impedance: 10V range: 0-1000Ω, 3V range: 800-1000Ω, 1V range and lower: 600Ω
- Meter accuracy: ±10% full scale
- Distortion: Less than 10% from 10Hz to 20kHz Square wave output
- Frequency range: 5Hz to 100kHz
- Output voltage ranges: 0.1V, 1V, 10V peak-to-peak into >2000Ω
- Output impedance: 52Ω on 0.1V and 1V ranges, Up to 220Ω on 10V range
- Rise time: Less than 50ns General

Frequency selection: First two significant figures on 0 to 100 and 0 to 10 switches each in ten steps
 Third figure on 0 to 1 control
 Multiplier switch x1, x10, x100, x1000
 Frequency error: Within $\pm 5\%$ of first and second digit
 Power requirement: 240V AC 50Hz, 6W
 Dimensions: 337 x 178 x 130mm

Order

HK27E (IG 5218 Audio Genrtr) £179.95

Sine and Square Wave Audio Generator IG-5282



- Sine and square wave outputs from 10Hz to 100kHz at 0 to 3V rms
- Separate outputs may be used simultaneously or independently

Useful in many audio applications, the IG-5282 Audio Oscillator provides sine and square wave frequencies from 10Hz to 100kHz in four ranges. This frequency range makes the IG-5282 ideal as a signal source for harmonic distortion measurements of audio amplifiers. The square wave output can also be used to trigger instruments such as frequency counters and oscilloscopes. The sine and square wave levels are independently adjustable from 0 to 3 volts.

Single circuit board construction makes this versatile audio oscillator easy and quick to assemble. The rugged cabinet can be stacked with its companion test instruments and features a handy storage compartment. The IG-5282 Audio Oscillator requires two 9-volt batteries for portable use or the IPA-5280-1 Power Supply for AC operation.

Specification

Frequency Output: 10Hz to 100kHz in four ranges.
 Sine Wave Output Voltage: 0 to 3 volts rms.
 Square Wave Output Voltage: 0 to 3 volts peak.
 Dimensions: 279 x 197 x 146mm.
 Weight: 1.5kg.

Order

HG12N (Heathkit IG 5282) £79.95

Function Generator IG-1271



- Sine, square and triangle waveforms from 0.1Hz to 1MHz
- Compact and lightweight for easy transporting and bench use

This versatile instrument supplies the basic sine, square and triangular waveforms needed for servicing electronic equipment or for driving experimental projects. These waveforms are produced over a frequency range from 0.1Hz to 1MHz. This wide range is divided into six frequency range segments through a front panel multiplier switch. Each smaller range is variably controlled by a front panel dial that adjusts the output frequency over a 100 to 1 ratio.

A front-panel BNC-type output jack supplies a 10 volt peak-to-peak signal into a low impedance 50 ohm load (20 volts peak-to-peak into an open circuit).

A calibrated attenuator, adjustable in 10dB steps from 0 to 50dB, decreases the output of the generator in six steps. A variable attenuator provides 0 to 20dB of additional attenuation of the output signal. The variable attenuator also acts as the power on/off switch.

Compact and lightweight, this function generator takes up very little room on your workbench and can be easily carried to wherever you'd want to use it. With its handle removed, the generator measures 222 x 181 x 75mm and weighs 1.9kg. It uses 105 - 130V AC or 210 - 250V AC at 50/60Hz, 15 watts maximum.

Order

HE93B (Heathkit IG-1271) £209.95

RF Oscillator IG-5280



This unit which includes probes is suitable for use in alignment of tuned stages in AM, FM and TV receivers. Output is divided into five bands from 310kHz to 110MHz and features an extra 100 to 220MHz band of calibrated harmonics. An added feature is the 1kHz audio output at 2V rms. The signal available at a front panel jack is ideal for tracing and isolation of circuit defects in receiver audio stages and also serves as a source of internal AM modulation. Test leads are included. Requires two PP3 batteries (not supplied). Size: 279 x 197 x 146mm.

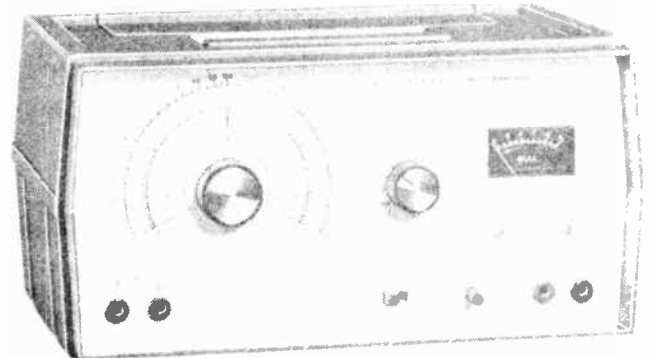
Specifications

RF Output: Frequency Range: 310kHz to 110MHz in five bands; 100MHz to 220MHz on harmonics. Output Voltage: Approx 100mV. Internal Modulation: 1kHz. Audio Frequency Output Frequency: 1kHz. Output voltage: 2.0 volts RMS open circuit.

Order

HK26D (IG-5280 RF Oscilltr) £79.95

RCL Bridge IB-5281



This quality kit allows you to measure capacitance from 10pF to 10 μ F, inductance from 10 μ H to 10H and resistance from 10 Ω to 10M Ω . Oscillator frequencies of 1kHz, 10kHz and 100kHz (or external source) are provided. Provided with a rugged moulded cabinet and component clips. Requires two 9V batteries (not supplied).

Specifications:

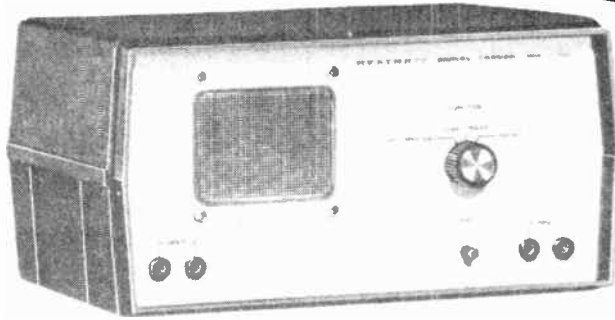
Resistance Ranges: 10 ohms to 10 megohms in three ranges. Inductance Ranges: 10 microhenries to 10 henries in three ranges. Capacitance Ranges: 10 picofarads to 10 microfarads in three ranges. Oscillator Frequencies: 1kHz, 10kHz, 100kHz. External Standard Range: 1:1 to 10:1.

Order

HK34M (IB-5281 RCL Bridge) £69.95

Signal Tracer IT-5283

NEW



• Audible ohmmeter voltmeter function works as a useful logic tracer

Simple, yet effective. The IT-5283 Signal Tracer is ideal for troubleshooting radio and TV circuits. Track down problems in all types of audio circuits. Check out logic circuits. Operates on two 9-volt transistor batteries or from IPA-5280-1.

Specification

Functions: Substitute speaker, AF signal tracing, RF signal tracing, Audible volt ohmmeter.
 Speaker: 3" permanent magnet.
 Dimensions: 279 x 197 x 146mm.

Order

HG13P (Heathkit IT-5283) £69.95

Power Supply For All 5280 Series Instruments IPA-5280-1

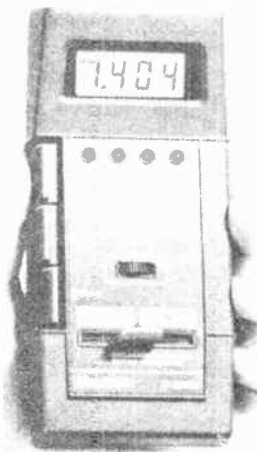
NEW

Simultaneously supplies -9V DC to all the 5280 series instruments from a selectable 12C or 240V AC.

Order

HG14Q (Heathkit IPA-5280-1) £49.95

Hand-Held Capacitance Meter IT-2250



- Measures all types of capacitors to 199.9mF with $\pm 0.2\%$ basic accuracy - automatically selects proper measuring range
- Features a large, easy to read liquid crystal display
- Built in polarised "Kelvin" terminals allow for direct measurement
- Remote extension cable for hard-to-reach spots
- Convenient zero offset control equalises the display level to compensate for stray capacitance within the meter and assure repeatable accuracy

This compact hand-held meter will measure capacitance on its easy-to-read LCD display from 0.1pF to 199,900 μ F. The auto range feature automatically selects the correct range of measurement from a choice of ten ranges. Four separate LED's indicate the correct unit of measure i.e. pF, nF, μ F or mF. The built-in polarised "Kelvin" terminals allow for direct measurement and remote extension lead allows capacitors to be measured in situ. A zero offset control equalises the display level to compensate for stray capacitance within the meter. Protection from excessive current is provided by clamp diodes and a 0.25A fuse when the instrument is turned on and by a 2.2 ohm, 2W resistor across the input when the instrument is off. The meter can test capacitors with a low operating voltage; it can detect leaky capacitors and it can measure electrolytic capacitors as a low bias voltage is superimposed on the test voltage.

Specifications

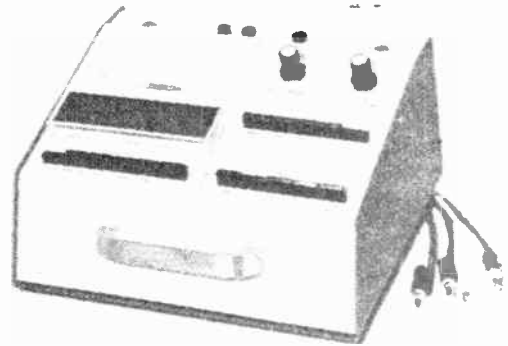
Ranges: 199.9pF, 1999pF, 19.99nF, 1.999 μ F, 19.99 μ F, 199.9 μ F, 19.99mF, 199.9mF. Accuracy Using Laboratory Standards: 199.9pF, 1999pF, 19.99nF and 199.9nF ranges $\pm (0.2\%$ or reading + count + 0.5pF). 1.999 μ F, 19.99 μ F, 199.9 μ F, 1999 μ F, 19.99mF and 199.9mF $\pm (5\%$ of reading + count) Using Heath Supplied Standards: 199.9pF, 1999pF, 19.99nF, and 199.9nF ranges $\pm (0.75\%$ of reading + 1 count + 0.5pF); 1999F, 19.99F, 1999 μ F, 19.99mF and 199.9mF ranges $\pm (6\%$ of reading + 1 count). Note: The accuracy of the Heathkit IT-2250 Capacitance Meter depends on whether you calibrate with the Heath supplied standards or laboratory standards. Specifications are listed above for both methods of calibration. Accuracy specifications apply to a temperature range of 19 to 25 degrees C. Conversion and display rate: For values up to 1999 μ F less than 1.5 seconds, for values up to 199.9mF less than ten seconds. Display: 3; digit (maximum count 1999) liquid crystal. Testing Voltage: 2.00V DC maximum; typically varying from 0.6 to 1.4V DC. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C). Storage Temperature Range: -4 to 140 degrees F (-20 to +60 degrees C). Battery Life: Approximately four to ten hours in continuous operation. Battery Indicator: Displays "LO BAT" warning when battery is down to approximately 5V DC. Overall Dimensions: 5.0 x 8.3 x 19.1cm. A PP3 battery is required (not supplied). Alternatively the meter may be run from the PS-2450 battery eliminator (see HM-2140A on page 150).

Order

HK28F (IT-2250 Capacitance Mtr) £204.95

FET/Transistor Tester IT-3120

NEW



- A quality instrument for checking semiconductor devices
- Large easy-to-read meter clearly shows tested values

This highly accurate instrument tests transistors, diodes, FETs, SCRs, triacs and UJT's in- and out-of-circuit. Easy-to-read meter clearly shows the actual operating characteristics of a device (gain, transconductance and leakage current), not merely a "good/bad" rating. This tester features pushbutton control plus an internal battery check. Use colour-coded test leads or built-in sockets. Powered by two 1.5V DC "D" cells (not included).

Dimensions: 212 x 131 x 210mm.
 Weight: 1.6kg.

Order

HE95D (Heathkit IT-3120) £119.95

Battery Life Tester GD-1703

Test all popular size batteries and end waste. Be certain a battery is dead before you throw it away. Does more than just give 'good - ? - bad' reading as do other testers. Actually indicates how much useful life remains on a 0 to 5 meter scale. Test alkaline or carbon-zinc 9V or 1.5V AA, C or D size batteries, plus the rechargeable 1.2V ni-cads. Is indispensable for households having many independently powered items: tape recorder players, radios, cameras, toys, smoke or burglar alarms, torches etc.



Order

HS60Q (GD-1703 Bat Test Kit) £21.95

CRT Tester and Rejuvenator IT-5230

NEW



- Test, clean and restore almost any colour or B/W picture tube
- Optional socket adaptor accessory widens range of testable CRTs

A must for every TV shop, the IT-5230 offers pushbutton control of separate testing, cleaning and rejuvenation of almost all current colour and black-and-white television picture tubes, even in-line-gun tubes. Each gun is individually controlled and monitored on its own grid current meter.

From the front panel you can precisely set the heater voltage of the CRT under test using a separate heater voltage meter. A cut-off control checks the operation of the tube's control grid and indicates a possible gassy condition. A front panel lamp indicates shorts in CRTs. A restore indicator glows brighter as a gun's current level is increased for an easy visual indication of rejuvenation. After rejuvenation, a separate cleaning process is applied to the guns to ensure proper tube operation. A special pushbutton provides a good indication of the life expectancy of the CRT. Included is a 4-foot heavy-duty test cable and four adaptor sockets with instructions for assembling optional sockets. This tester operates on 120/240V AC.

Dimensions: 343 x 254 x 140mm.
Weight: 3.5kg.

A CRT Socket Adaptor is also available and allows you to test even more CRT's using the IT-5230. It uses universal clip leads to hook up and test CRT's with known base configurations.

Order

HE98G (Heathkit IT-5230) £179.95
MD06G (Heathkit ITA-5230-1) £39.95

FM Deviation Meter IM-4180

NEW



- Measures the FM output of transmitters and signal generators
- Checks peak FM deviation of signals between 25MHz and 1000MHz

Measure the peak deviation (frequency modulation) of transmitters and signal generators whose carrier frequencies are between 25 and 1000MHz with the IM-4180 FM Deviation Meter. Four pushbutton switches select modulator ranges from 2 to 75kHz with coarse and fine tuning controls for locking in difficult UHF FM signals. Monitor a line directly or use an optional antenna (HK94C).

178

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

Added features include selection of correct de-emphasis for audio signals and a switch-enabled internal battery level check. Connect an 8-ohm speaker or headphones for audio monitoring. Front panel oscilloscope jacks enable you to observe signal waveshapes. Level controls are provided for adjusting meter sensitivity and audio output. Requires ten AA batteries.

Dimensions: 127 x 262 x 183mm.
Weight: 1.9kg.

Order

HE96E (Heathkit IM-4180) £224.95

Resistance Box IN-3117



Invaluable as a variable multiplier or shunt, a variable substitution resistor or as a leg for AC and DC bridges, this laboratory-type decade resistance box helps solve complex resistance problems where a large range of measurement values is necessary. Covers 1 ohm to 999,999 ohms in 1-ohm steps. 0.5% tolerance 1 watt resistors. Features rugged case and binding posts for easy test set-ups. Dimensions 12.7 x 19.1 x 16.8cm.

Order

HK52G (IN-3117 Resistnc Box) £79.95

30kV DC Probe IMA-100-10



May be used with any meter providing it has a 300V range with a 10MΩ input. The lead is supplied with banana plugs.

Order

HK93B (IMA-100-10 DC Probe) £21.95

40kV Meter IM-5215



- Checks positive high DC voltages in TV's and oscilloscopes
- Easy-to-assemble kit goes together in one evening

The IM-5215 is an ideal instrument to use in measuring voltages up to 40,000 volts which are normally found in television and oscilloscope circuits. All measurements made with this self-contained probe are accurate to within ±3%.

Order

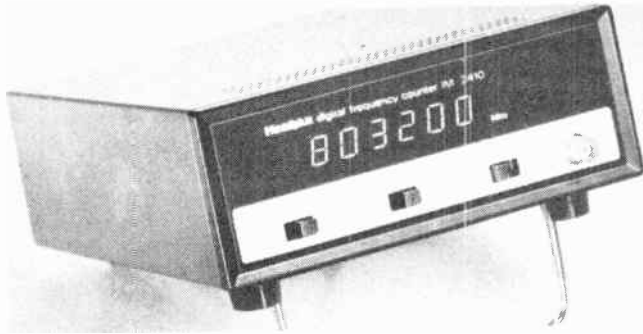
HT51F (Heathkit IM-5215) £39.95

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225MHz Frequency Counter IM-2410



- Exceptional accuracy and simplified operation
- Switchable 10Hz-50MHz and 20MHz-225MHz ranges for high resolution frequency readouts
- Big, easy-to-read eight-digit LED display with automatic decimal point placement

Accuracy and Stability

The IM-2410 features two frequency ranges — from 10Hz to 50MHz and from 20MHz to 225MHz — for increased accuracy and better resolution. A single input covers the entire frequency range, making the IM-2410 more convenient to use.

Two-Position Time Gate

You can choose either 0.1 second or 1.0 second gate times for even better resolution. And the crystal controlled time base gives you the good long-term stability and accuracy you would expect to find on much more expensive counters ± 1 parts per million.

Front panel operation for easy bench use

For fast and efficient frequency measurements, all controls are located on the IM-2410's front panel. One BNC input is provided for fast, direct frequency counts. For non-direct counts, attach the optional SMA-2400-1 Swivelling Telescopic Antenna.

Easy to read display

The eight-digit LED display shows all frequencies in MHz for higher resolution (as fine as 1Hz at 50MHz, 10Hz at 226MHz). A cabinet stand props the IM-2410's display at a comfortable viewing angle.

Interference-free cabinet construction

The IM-2410's housing is made of metal for greater durability and better radio-frequency interference (RF) shielding. Operates on 120/240V AC.

Specifications

Display: Eight-digit LED display. Frequency Ranges: 10Hz to 50MHz and 20MHz to 225MHz. Sensitivity: 10Hz-50MHz range 20mV RMS maximum, 10mV typical from 10Hz-30MHz, 50 mV RMS maximum from 30-50MHz; 20MHz-225MHz range. 25mV RMS maximum, 10 mV typical from 20-150MHz, 50 mV RMS maximum from 150-225MHz — derating to 5V AC from 160MHz to 225MHz. Time Base Frequency: 3.58MHz. Stability: ± 1 ppm. Temperature Stability: ± 10 ppm from 0 to 40 degrees C. Gate Time: 0.1 or 1.0 second switch selectable. Frequency Resolution: 10Hz to 50 MHz range ± 1 Hz with gate time set at 1.0 second and ± 10 Hz with gate time set at 0.1 second, 20MHz to 225MHz range ± 10 Hz with gate time set at 1.0 second ± 100 Hz with gate time set at 0.1 second. Power Requirement: 120/240V AC, 50/60 Hz, 25 watts maximum. Overall Dimensions: 8.6 x 18.4 x 24.1cm.

Order

HK54J (IM-2410 Freq Counter) £169.95

Hand-Held Frequency Counter IM-2400

- Battery operated for in-field frequency testing
- Batteries mount internally for true portability
- Two switch selected frequency ranges and time bases

Now you can accurately test and align anywhere

Test mobile radio equipment in cars, trucks, aircraft, boats — anywhere you want with the IM-2400. Technicians and amateur radio enthusiasts will find it ideal for servicing mobile gear. Using rechargeable batteries, this compact counter measures just 4.1 x 8.6 x 21.3cm.

The IM-2400 features a 10 MHz crystal oscillator

That ensures stable and accurate frequency monitoring through both the 50Hz-50MHz and 40MHz-512MHz ranges. With a typical sensitivity of 10 millivolts RMS and a guaranteed sensitivity of 25 millivolts RMS the IM-2400 lets you measure even very weak signals. The big seven-digit LED display has automatic decimal point placement to help ensure mistake free readings on every count you take.

Completely portable

The IM-2400 has rechargeable nickel-cadmium batteries that provide hours of measurements on a single charge — and the batteries can be recharged hundreds of times to save on battery replacement cost. The batteries are located inside the instrument to eliminate awkward external battery packs.

Also for bench use

A pivoting stand (included) supports the IM-2400 at a convenient viewing angle for work at your test bench. Add the optional PS-2405 240V Battery Eliminator Charger to operate the IM-2400 directly from the mains to conserve battery power. Take testing and alignment convenience with you anywhere, when you buy the Heathkit IM-2400 Hand-Held Frequency Counter. Uses five rechargeable 1.2V DC nickel cadmium "AA" cells (included) or 240V AC power with the optional PS-2405 Battery Eliminator/Charger below.

Specifications

Input Impedance: 50Hz to 50MHz range, 1 megohm shunted by less than 20pF; 40MHz to 512MHz range 50 ohms. Input Protection: 50Hz to 50MHz range, 150V RMS to 100kHz, derating to 10 volts RMS at 50MHz, 40MHz to 512MHz range 5V RMS. Stability: ± 1 ppm. Temperature Stability: ± 10 ppm from 0 to 40 degrees C. Gate Time: 0.1 or 1.0 second switchable. Resolution: 50Hz to 50MHz range ± 10 Hz with time base set at 0.1 second ± 100 Hz with time base set at 1.0 second; 40MHz to 512MHz range ± 100 Hz with time base set at 0.1 second, ± 1 kHz with time base set at 1.0 second. Power Requirement: Five 1.5V DC rechargeable nickel-cadmium cells (included) or 240V mains with optional PS-2405 Battery Eliminator/Charger. Dimensions: 4.1 x 8.6 x 21.3cm.

Order

HK55K (IM-2400 Hand-Freq Ct) £149.95
HK67X (PS2405 Hand-Freq PSU) £19.95

Swivelling Telescopic Antenna SMA-2400-1

Swivelling Telescopic Antenna for the IM-2400 and IM-2410 Frequency Counters and the IM-4180 FM Deviation Meter. Can also be used on two-metre amateur radio transceivers. This chrome-plated brass antenna, with its right-angle design and telescoping capability, gives you improved performance and better signal sensitivity. Includes BNC connector. The item is fully assembled.

Order

HK94C (SMA-2400-1 Antenna) £19.95

Precision Oscilloscope Calibrator IG-4244



- Rise time less than 1 nanosecond
- 24 speeds from 0.5 seconds to 10 nanoseconds
- 1kHz square wave in 16 voltages
- 1kHz sine wave at 1 volt peak-to-peak

Oscilloscope calibrator

The IG-4244 provides you with accurate time and amplitude signals for making those critical scope adjustments and calibrations. Fast-rise square waves are supplied for adjusting sweep speeds, delay line terminations, and high frequency compensation. Precise voltage signals are used for vertical calibration and attenuator compensation.

Bench standard

In addition, you can use the IG-4244 to calibrate other test equipment or act as a signal source when you build and test experimental projects. Front-panel BNC connectors ensure solid cable connections for all applications. Two BNC to BNC cables are included with kit. One BNC output cable is terminated in 50Ω to assure a good frequency response.

Crystal controlled

Two crystal oscillators supply twenty-four square wave signals with very accurate times from 0.5 seconds (2 Hz) to 10 nanoseconds (100 MHz) in a 1-2-5 sequence. The risetime of these signals is less than 1 nanosecond (with less than 2% or 10 mV aberrations, whichever is greater) which is well suited for making high frequency compensation adjustments on oscilloscope vertical amplifiers with bandwidths greater than 100MHz. Being crystal controlled, the time signals are accurate to 0.015%. The time connector is terminated in a 50 ohm load which prevents ringing and overshoot and minimises cable reflections.

Accurate square wave voltages

Electrically separated from the time circuits, the voltage output supplies sixteen voltages at about a 1kHz square wave. These voltages are in a 1-25 sequence from 1 millivolt to 100 volts peak. This low square wave signal is best for oscilloscope vertical input attenuator and probe compensation adjustments. Also conveniently available on the front panel is a sign wave output of approximately 1kHz at about 1 volt peak to peak used to adjust trigger circuits.

An excellent source of alignment signals

For oscilloscopes above a 100 MHz bandwidth, the IG-4244 can be assembled in about 8 hours. All output connectors, switches and controls are located on the front panel for efficient calibrator use. It uses either 120V AC or 240V AC (50/60 Hz) and measures 7.6 x 18.4 x 24.1cm.

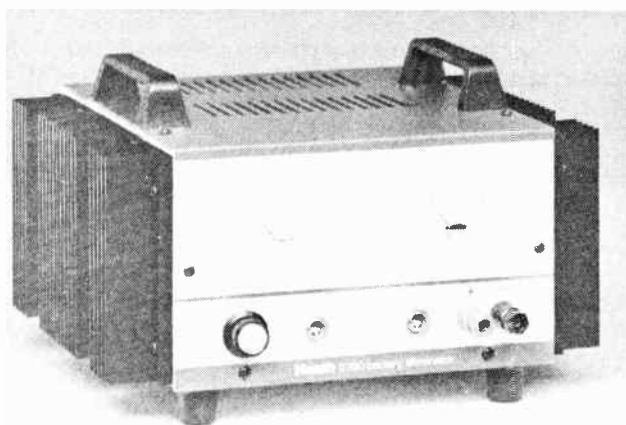
Specifications

Time Range: 0.5s to 10ns. Accuracy: 0.015%. Amplitude: 0.5s to 20ns: 100mV to 1V peak. 10ns: 100mV to 0.5V peak. Rise Time: <1ns. Leading Edge Aberrations: <2% of peak to peak amplitude or 10mV whichever is the greater. Output: 50 ohms nominal. Voltage Range: 1mV to 100V peak in a 1-2-5 sequence. Accuracy: <±1%. Rise Time: <5μs. Frequency: Approx 1kHz. Sine Wave: Frequency: Approx 1kHz. Amplitude: Approx 1V p-p. Power Requirements: 120/240V AC, 50/60 Hz, 25 watts minimum. Operating Temperature: 10 to 40 degrees C.

Order

HK95D (IG-4244 Osc Calibrtr) £189.95

Heavy Duty Power Supply IP-2760



- Output variable from approximately 9 to 15 volts
- Continuous 12A current output or 20A intermittent
- Front panel meters monitor voltage and current

For any high-current usage between 9 and 15 volts DC, such as for Ham and CB radio servicing, the IP-2760 reliably supplies all your required power. When a lot of current is required, the Battery Eliminator maintains less than a 2% output change under varying load conditions. Effective filtering removes AC for less than a 1% output ripple at full load. Double heatsinks allow the IP-2760 to run cooler while its four power transistors are fused at 20 amps to protect it against over-loads. A front panel voltage meter indicates the output voltage.

Specifications:

Output Voltage: Variable from 9.15V DC. Output Current: 12A continuous, 20A intermittent (per derating curve in manual). Ripple: Less than 1% at full load. Regulation: Less than 2% variation from no load to full load. Fuses: 7A, 3AG slow-blow primary; 20A, 3AG output. Power Requirement: 120/240V AC, 50/60 Hz, 840 watts. Dimensions: 28 x 28 x 13.3cm.

Order

HT52G (Heathkit IP-2760) £199.95

Tri-Output Power Supply IP-2718



- Fixed 5V DC output at 1.5 amps plus two separate adjustable 20V DC outputs at 0.5A
- All outputs short-circuit proof with current limiting
- Independent outputs can be connected together

Ideal for design or experimentation

The 5V DC output is rated at 1.5 amps which is enough to power most digital devices. The two variable 20V DC outputs provide 0.5 amps each and feature a special "tracking" mode. In this mode, one 20 volt supply can be set at a certain voltage and as the second 20 volt supply is adjusted, the voltage difference between the two will remain the same. This feature is ideal for providing + and - voltages for operational amplifier circuits. All three outputs can be operated independently from each other with either floating or referenced grounds. The three outputs can also be connected in series to provide up to 45V DC or connected in parallel to supply higher current through a load. Each supply is overload protected with their output currents fixed slightly above rated current to provide short-circuit protection. A front panel meter allows you to monitor any of the voltage or current outputs. All outputs and controls are readily accessible on the front panel, and clearly marked for easy operation. Metal housing is painted in instrument blue.

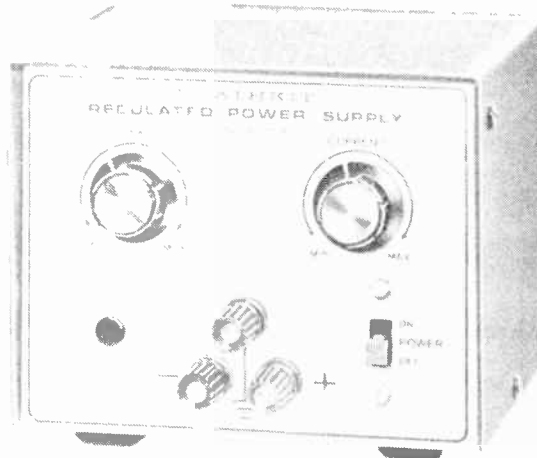
Specifications

Outputs: 5V DC at 1.5A; 0-20V DC at 0.5A. Regulation no load to full load: <0.1% variation on 20V supplies; <3% variation on 5V supply. For 10V line voltage change: <0.2% variation on 20V supplies; <0.15% variation on 5V supply. Power Requirement: 120/240V AC, 50/60 Hz watts full load. Dimensions: 11.4 x 27.3 x 22.9cm.

Order

HK53H (IP-2718 Tri-Output PSU) £144.95

Variable Low-Voltage Power Supply IP-2728



- Floating ground permits positive or negative outputs
- Output voltages can be AC or DC voltage controlled

A very useful power source for the test-bench

The unit has a continuously variable output voltage from 1V to 15V DC at up to 500mA and features 500mV line and 50mV load regulation. The "floating ground" system enables the supply to furnish positive or negative output voltages. The programming terminals on the rear of the cabinet enable you to use an AC or DC voltage from another source to control the output voltage of this power supply. The unit has fully adjustable current limiting. Size 146 x 140 x 110mm.

Order

HK35Q (IP-2728 Low-Volt PSU) £61.95

Regulated High Voltage Power Supply IP-2717A



- Separate 0 to 400V DC at 100mA high voltage output plus 0 to -100V DC at 1mA bias voltage output.
- Separate 6.3V AC and 12.6V AC filament heater outputs.

The IP-2717A is a compact, convenient source of variable regulated high voltage, plus filament voltage for workshops and experimenters working with valve circuits primarily, although it will work just as well as a power source for high voltage solid state equipment provided the total current consumption doesn't exceed 100mA (definitely not suitable for colour TV Line Output stages, Supply Regulators etc). The High Voltage (B+) output provides 0 to 400V of regulated DC at a continuous 100mA or an intermittent 125mA. This has less than 10mV (rms) ripple and a DC stability better than 1% over all load conditions up to the maximum. The bias (C-) output provides negative DC from 0 to -100V to a maximum of 1mA. The high voltage supply and bias terminal posts are insulated from chassis, and each other, allowing high B+ and C- outputs to be used as either negative or positive voltage sources. The two heater supplies, 6.3V and 12.6V AC, may be used simultaneously provided the total power consumption does not exceed 25VA. The filament heater supply transformer is separate from the HT transformer, allowing the HT supply to be turned off whilst the valves remain on 'stand-by' - that is electrically inactive but with the cathodes maintained at working temperature by the heater supply so that the valves can operate immediately the HT is restored. HT supply current is monitored by an ammeter in addition to the output voltmeter on the front panel. A special taper control allows fine adjustment of the bias voltage output for the benefit of e.g. sensitive valve amplifier set-ups that wouldn't take kindly to 'excessively' abrupt changes in DC grid bias.

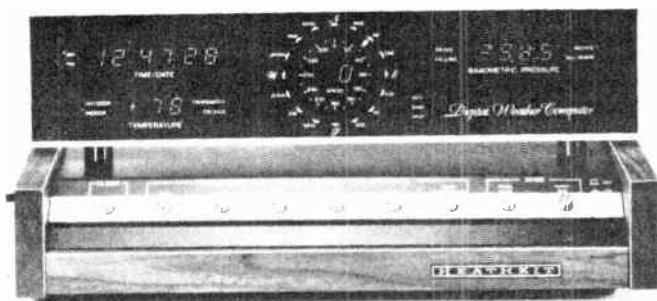
Specification:

HT Output Voltage: 0-400V DC. Bias Voltage: 0-100V DC. Heater Supply: 6.3V AC and 12.6V AC. Regulation: $< \pm 1\%$ from zero to full load. Supply ripple: $< 10\text{mV}$. Output Impedance: $< 10\Omega$ at DC to 1MHz. Power requirement: 120/240V AC 50/60Hz. Dimensions: 340 x 286 x 140mm.

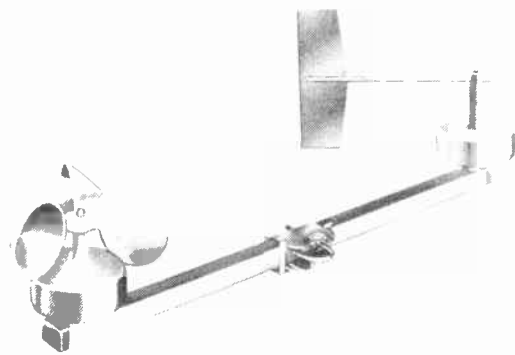
Order

HG46A (Heathkit IP-2717A) £219.95

WEATHER KITS Computerised Weather Station ID-4001



- Displays time/date, indoor and outdoor (°F or °C) temperature, wind speed and direction and barometric pressure (rising or falling)
- Microprocessor accuracy and memory stores past weather data so you can see trends
- Instantly recalls past weather statistics at the push of a button; Clear feature erases memory
- Professional looking solid walnut cabinet with brushed aluminium trim panels
- Remote windcup and weathervane transmitter assembly mounts on a 1" to 1½" mast for years of dependable, trouble-free service
- Styled to match any decor, it offers instant access to more comprehensive atmospheric data than was ever available before to the layman with a serious interest in weather phenomena and forecasting



There's nothing else like it available today!

A personal weather computer that not only monitors the current weather data, but also computes significant changes and stores data in its memory for your personal and business planning.

The Heathkit Digital Weather Computer

Gives you instantly accurate past and present weather data to aid in forecasting future activity. For professional climate watchers, farmers, boaters, pilots, campers, science teachers — for anyone going outdoors — the weather station can tell you what to expect. A microprocessor puts ALL the information at your fingertips!

Weather Information at the touch of a button

Gives you the time in AM/PM or 24-hour format, plus the data for exact log entries: both the indoor and outdoor temperature, whether its above zero or below, in Fahrenheit or Centigrade scales; outdoor wind chill factor plus the indoor/outdoor minimum and maximum temperatures since last memory clearance; instantaneous wind velocity with digital accuracy and 16-point compass resolution, in mph, kph or knots; the average wind speed and direction, and peak gust since last cleared; barometric pressure with four-digit accuracy in inches or millibars, and if it is rising or falling. Last but not least you can use the minimum and maximum barometric pressure readings to determine the passage of weather fronts.

Beautiful styling and a unique digital data display

Not only do you get more weather data, but also functionally elegant design. The readout panel is trimmed in brushed aluminium and features large bright red 7-segment displays on a black background for easy reading. The handsome, solid oiled-walnut computer cabinet has clearly marked front panel buttons.

Our electronic almanac has more memories to store data

The Digital Weather Computer records the high and low temperatures, the minimum and maximum barometric pressures, peak wind speed and most importantly the time and date each occurred. It calculates the rate at which the barometric pressure changes so you can be alerted to storm fronts. A push of the button can tell you if the big one is about to break — a rate of 0.02" or 0.03" may mean conditions are developing, but a change reading of 0.06" or more tells you a real storm is upon you. The data is stored in memory until you choose to clear it, and you may connect an external battery to hold the memory contents during power failures.

Technical sophistication unequalled at this price

The ID-4001 uses a remote transmitter with anemometer and weathervane that have been designed in an aerospace wind tunnel. A compact boom assembly relays data to the computerised console indoors. Rather than relying on friction-causing mechanical devices, they use solid-state infra-red sensors and transmissive optical encoding technology for higher accuracy than conventional indicators. The wind speed sensor is sensitive to within one-tenth of a mile per hour! The barometer readings are derived from a newly-developed piezo-resistive silicon bridge transducer that senses the most minute changes in pressure. It's the first and only, truly digital barometer!

If you want the fun and savings of building it yourself

You'll find the Heathkit Digital Weather Computer surprisingly easy to build, thanks to the fully illustrated step-by-step assembly manual. It's an easy and enjoyable kitbuilding experience, with uncrowded circuit boards for easy parts placement and wiring harnesses that minimise point-to-point wiring.

Specification:

DIGITAL CLOCK/4-YEAR CALENDER. Time accuracy: Determined by accuracy of mains. No accumulative error. WIND VECTOR: Accuracy: $\pm 5\%$ or better. Direction Display: Accuracy $\pm 11.26\%$ degrees. THERMOMETER: Temperature Range: -40° to 70° C; -40° to 158° F. Accuracy: $\pm 1^{\circ}$ on Centigrade readings; $\pm 2^{\circ}$ on Fahrenheit readings. BAROMETER: Pressure Range: 28.00 to 32.00 in. Hg (inches of mercury), 981.9 to 1050 millibars. Accuracy: ± 0.075 in Hg plus ± 0.01 in. Hg°C. Operating Temperature: Outdoor assemblies, -40° C (-40° F to 158° F). Unit, 10° to 35° C (59° to 95° F). Power requirement: 240V AC. Provision for external battery connection for memory backup during power failures. Dimensions: 18.4 x 40.6 x 15.2cm. *Requires cable from sensor to main unit. Suitable type is XR27E.

Order

HK56L (ID-4001 Weather Cmpr) £499.95

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

KNOBS

Collet Knobs 183
Drives 184

Metal Knobs 183
Plastic Knobs 182

Slide Knobs 184
Spindles 184

A range of attractive modern knobs. All types have grub-screw fixing and are suitable for fixing to 6mm or 6.35mm (1/4 in.) shafts.

PLASTIC KNOBS Pointer Knob (BK12)



Standard pointer knob with white line. Length 33mm. Width (max) 19mm. Height 17mm.

Order
RW75S (Knob BK12) 24p

Low-Height Knob (RN92)



Small knob with serrated sides and spun aluminium insert. Diameter: 21mm. Height: 13mm.

Order
RX99H (Knob RN92) 38p

Small Ridged Knobs (KB3 & KB4)



Two knobs with white pointer line and a skirt. Sides have narrow raised ridges for a firm grip. Fitted with a spun aluminium insert. KB3 has recess for control fixing nut.

KB4: Diameter 20mm. Height 17mm.
KB3: Diameter 25mm. Height 19mm.

Order
RW87U (Knob KB4) 28p
RW86T (Knob KB3) 48p

Recessed Knobs (K1 & K2)

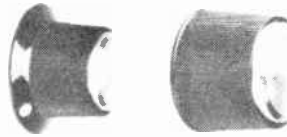


A pair of knobs with a deeply recessed spun aluminium insert marked with a black line. Side is serrated. Both types have a recess for control fixing nut.

K1: Diameter 26mm. Height 18mm.
K2: Diameter 33mm. Height 19mm.

Order
HB23A (Knob K1) 40p
HB24B (Knob K2) 48p

Skirted and Unskirted Pair (M1 & M2)



An identical pair of knobs except that one has a skirt and one has not. Both are fitted with a spun aluminium cap and have serrated sides. They have a recess for control fixing nut. Skirted version has a white indicator spot on the skirt.

M1: Diameter 19mm.
Height 16mm.
M2: Diameter 25mm.
Height 16mm.

Order
RW88V (Knob M1) 35p
RW89W (Knob M2) 38p

Mirror Finished Pair (M3 & M4)



A matching pair of knobs with a mirror finish chrome insert and white pointer spot on the skirt. Sides are wide ridged and both types have a recess for control fixing nuts.

M3: Diameter 26mm.
Height 15mm.
M4: Diameter 36mm.
Height 17mm.

Order
RW90X (Knob M3) 28p
RX00A (Knob M4) 45p

Satin Finished Knob

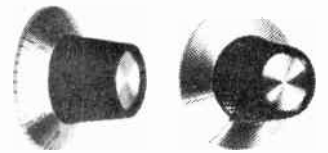


Knob with a satin finish insert. It has serrated sides, into which pointers can be slotted, giving a high degree of versatility.

K605: Diameter 32mm.
Height 15.5mm.

Order
FG13P (Knob K605) 78p
FG15R (Pointer Red) 5p
FG16S (Pointer White) 5p
FG17T (Pointer Black) 5p

Calibrated and Pointer Pair (30mm dia.) (F10 & F11)



A matching pair of knobs with a spun aluminium insert and a wide aluminium skirt. Sides are serrated. Type F11 has a black indicator line on the skirt and type F10 is calibrated 0 to 9.9. Both types have recess for control fixing nut.

Both types: Diameter 30mm.
Height 18mm.
Order
RW78K (Knob F10) 48p
HB26D (Knob F11) 48p

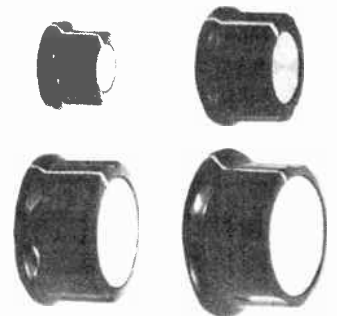
Calibrated And Pointer Pair (37mm dia.) (NK2 & PK2)



A matching pair of knobs with a spun aluminium skirt. Sides are serrated. Type PK2 has a black arrowhead on the skirt and type NK2 is numbered 0 to 10 on the skirt. Both types have recess for control fixing nut.

Both types: Diameter 37mm.
Height 15mm.
Order
RX01B (Knob NK2) 48p
RX02C (Knob PK2) 54p

Fluted Range (K7)



A range of fluted knobs with white indicator line, narrow skirt and spun aluminium insert. All types have recess for control fixing nut except K7A.

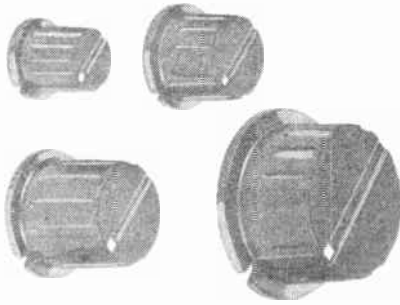
K7A: Diameter 19mm.
Height 12mm.
K7B: Diameter 27mm.
Height 16mm.
K7C: Diameter 33mm.
Height 16mm.
K7D: Diameter 45mm.
Height 21mm.

Order
YX01B (Knob K7A) 28p
YX02C (Knob K7B) 32p
YX03D (Knob K7C) 38p
YX04E (Knob K7D) 58p

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Matt Black Range K14

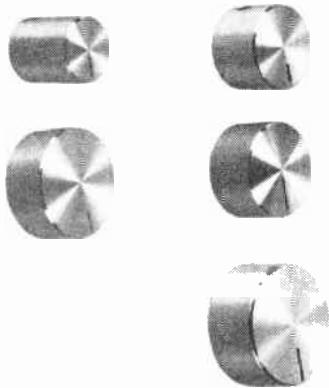


An attractive range of matt black finish knobs with serrated finger-grip sides and a narrow skirt. The top of the knob features a shallow channel which matches in with the serrated finger-grip pattern. One end of the channel has a square, white pointer dot which complements a square cut-out or recess in the skirt. Knob K14D has a recess for a control fixing nut.

K14A: Diameter 15mm.
Height 14mm.
K14B: Diameter 19.5mm.
Height 15mm.
K14C: Diameter 24mm.
Height 20mm.
K14D: Diameter 35mm.
Height 17mm.

Order	
FK38R (Knob K14 A)	18p
FK39N (Knob K14 B)	24p
FK40T (Knob K14 C)	30p
FK41U (Knob K14 D)	40p

Spun Aluminium Range (R51-54 & R76,77)



A plastic knob with a spun aluminium cap covering the whole knob. Aluminium cap has a black marker line. Five sizes are available of which all have a recess for control fixing nut except R51. The following sizes are available:

Type	Diameter	Height
R51	14mm	16mm
R52	18mm	12mm
R76	22mm	13mm
R77	28mm	13mm
R54	38mm	16mm

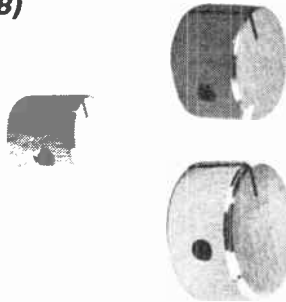
Order	
HB28F (Knob R51)	50p
HB29G (Knob R52)	70p
RX07H (Knob R76)	78p
RX08J (Knob R77)	80p
HB31J (Knob R54)	90p

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SOLID ALUMINIUM KNOBS Brushed Aluminium Range (K8)

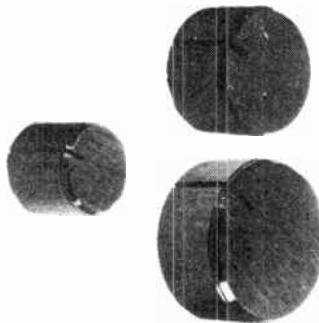


Very attractive solid brushed aluminium knob with a groove cut as an indicator line. All sizes have a recess for control fixing nut.

K8A: Diameter 15mm.
Height 14mm.
K8B: Diameter 22mm.
Height 14mm.
K8C: Diameter 28mm.
Height 14mm.

Order	
YR64U (Knob K8A)	60p
YR65V (Knob K8B)	78p
YR66W (Knob K8C)	95p

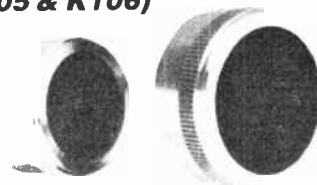
Black Aluminium Range (K10)



A range of knobs identical to the K8 series, except that they have a matt black finish.

Order	
RK89W (Knob K10A)	60p
RK90X (Knob K10B)	78p
RK91Y (Knob K10C)	98p

Textured Range (K105 & K106)



Solid aluminium knob with a serrated top edge and matt black textured inlay on the top. With recess for control fixing nut. Available in two sizes with an indicator line and two sizes without indicator line.

With indicator line:		Without indicator line:	
K105L: Diameter 28mm.	Height 16mm.	K105: Diameter 24mm.	Height 16mm.
K106L: Diameter 40mm.	Height 16mm.	K106: Diameter 40mm.	Height 16mm.

Order	
HB34M (Knob K105L)	95p
HB35Q (Knob K106L)	95p
HB32K (Knob K105)	65p
HB33L (Knob K106)	75p

Serrated Fingergrip (K15)



Solid aluminium knob with serrated fingergrip and spun top. Recess for control fixing nut. Diameter 15mm. Height 16mm.

Order	
HB36P (Knob K15)	48p

Black Anodised Range (K44-K45)



Very high quality solid aluminium knob with a bright black anodised finish. There is a bright aluminium line around top edge and a fluted fingergrip. Recess for control fixing nut.

K44: Diameter 18mm.
Height 18mm.
K45: Diameter 22mm.
Height 19mm.

Order	
HB39N (Knob K44)	85p
HB40T (Knob K45)	95p

COLLET KNOBS Knob



High quality polycarbonate knobs having a most attractive modern appearance. Suitable for 1/2in spindles, the collets are tightened or loosened by means of a screw in the top of the knob which is normally hidden by a push fit cap. Knob black (Dia. 15mm, Height 16mm)

Order	
RX16S (Collet Knob Black)	48p

Cap



These plug into the top of the knob and hide the collet assembly. They can also be used for colour coding. Available in black, blue, green, grey, red and yellow.

Order	
WL45Y (15mm Collet Cap Blk)	8p
WL46A (15mm Collet Cap Blue)	8p
WL47B (15mm Collet Cap Grn)	8p
WL48C (15mm Collet Cap Grey)	8p
WL49D (15mm Collet Cap Red)	8p
WL50E (15mm Collet Cap Yllw)	8p

Pointer

These are available in three colours, black, red and yellow. They plug into the base of the knob.

Order	
WL51F (15mm Collet Pntr Blk)	8p
WL55K (15mm Collet Pntr Red)	8p
WL56L (15mm Collet Pntr Yllw)	8p

Nut Cover



This plugs into the base of the knob and hides the potentiometer fixing nut. Available only in black with a white line.

Order

RX18U (15mm Collet Nut Cvr) 18p

Pointer Skirt



This plugs into the base of the knob and has a white triangle embossed on a black opaque skirt.

Order

RX19V (15mm Collet Indctr) 24p

Numbered Skirt



This also plugs into the base of the knob and has the numbers 0 to 11 embossed in black on a transparent dial.

Order

RX20W (15mm Collet Skirt) 28p

Stator



For use with numbered skirt. Black disc has one white segment. The stator is fitted to the panel with a slotted nut allowing the figure dial to rotate over it. Thus only one number stands out clearly against the white segment of the stator whilst the remaining numbers "disappear" against the black background.

Order

RX21X (15mm Collet Stator) 28p

Slotted Nut



This nut is required for fixing the stator described above. 10mm metric threaded controls will need the metric nut whilst the standard 3/16in. threaded controls will need the imperial type. Manufacturers of controls are gradually changing over from 3/16in. to 10mm threads. We regret therefore that we cannot guarantee which type of thread you will receive.

Order

WL43W (3/8in Nut) 18p
WL44X (10mm Nut) 18p

Low Cost 'Collet' Knobs



An attractive black silk-finish plastic knob in a style similar to true collet knobs, but having grub-screw fixing for standard 1/16in shaft. The knob has an integral nut-cover, and seven different colour caps are available separately to plug in the top of the knob body. Has recess for control fixing nut.



Diameter: 19mm.

Height: 21mm (with cap).

Caps are engraved with white indicator line. (White cap has black line.)

Order

YG40T (Low-Cost Collet Knob) 35p
QY00A (LC Cap Black) 8p
QY01B (LC Cap Blue) 8p
QY02C (LC Cap Green) 8p
QY03D (LC Cap Grey) 8p
QY04E (LC Cap Red) 8p
QY05F (LC Cap White) 8p
QY06G (LC Cap Yellow) 8p

KNOB FOR SLIDE POTS

The following range of knobs fit our slide pots and any other slide pot with a 4 x 1.2mm (approx) tang.

Type A

A matt finish, black knob with white line. Knob will only fit with line at right angles to the length of the pot. Flared sides.

Size of base: 20 x 14mm.

Size at top: 16 x 8mm.

Height: 13.5mm.

Shaft depth: 8mm.



Order

RX22Y (Slide Knob A) 20p

Type B

A miniature version of our Type A knob.

Size of base: 12 x 8.5mm.

Size at top: 9 x 4.5mm.

Height: 9mm.

Black with a white line. Shaft depth: 6mm.



Order

YG09K (Slide Knob B) 20p

Type F

A matt finish knob with serrated top and white line.

Knob will only fit with line at right angles to the length of the pot. Size of base: 22.5 x 10.5mm.

Height: 11mm.

Shaft depth: 8.5mm.

Available in the following

colours: Black, Blue,

Green, Grey and Red.



Order

RX24B (Slide Knob F Blk) 20p
RX25C (Slide Knob F Blue) 20p
RX26D (Slide Knob F Green) 20p
RX27E (Slide Knob F Grey) 20p
RX28F (Slide Knob F Red) 20p

DIALS AND ACCESSORIES

Spindle Coupler



Brass spindle coupling. Precision turned from brass rod for extending all types of 1/16in spindles. Four flush-fitting grub screws ensure non-slip trouble-free operation.

Length 22.5mm

Outer diameter 9.5mm

Order

RX29G (Spindle Coupler) 98p

Extension Spindle



Brass extension spindle that fits all 6.35mm (1/4in) spindles. Spindle retainer has two 6BA screws and extension spindle is 64mm long x 6.35mm (1/4in).

Order

RX30H (Ext Spindle) 98p

Nylon Rod



1/4in. (6.35mm) dia. rod for extending spindles. Strong and slightly flexible. It is supplied in 6in. (152mm) lengths (nominal).

Order

RX38R (Nylon Rod) 28p

Steel Cord Drive



A brass bush (panel cut-out 3/16in.) through which a standard 1/16in shaft revolves in a ball race. Spindle extends at rear of bush to allow flywheel to be fitted. Total length: 62mm. Length from front of bush: 36mm.

Order

RX46A (Cord Drive Steel) £1.95

Brass Bush



A brass bush (panel cut-out 3/16in.) to support long spindle in front panel or guide spindle fixed in sub-chassis through front panel. Suits standard 1/16in spindles.

Overall length: 13.5mm.

Order

RX31J (Brass Bush) 28p

Drive Cord

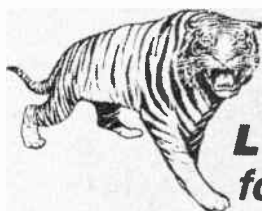
A nylon covered spun-glass-cored drive cord. Non-stretch and non-slip.

Diameter: 0.56mm.

Breaking strain: 10lb. Sold per metre.

Order

BL73Q (Drive Cord) 8p



BIG CAT

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Cord Fixing Drum

A steel drum with brass bush which clamps on standard $\frac{1}{8}$ in spindles by two 4BA screws. Available in two sizes: 54.5mm dia. (small) and 95.5mm dia. (large).



Order

RX43W (Cord Drum Small)	95p
RX94C (Cord Drum Large)	98p

Flywheel

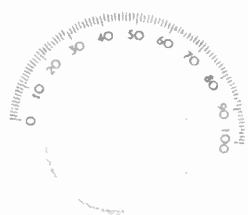


A heavy lead flywheel with a brass bush for fixing (by two grub screws) to standard $\frac{1}{8}$ in spindles for use with tuning dials. Overall size: 10mm x 51mm dia (bush protrudes by 6.3mm). Weight: 6oz (170gm).

Order

RX44X (Flywheel)	£4.45
-------------------------	-------

Aluminium Dial



Dial incorporates a ball drive type 4511F. Output shaft fits standard 6.3mm ($\frac{1}{8}$ in.) shaft. Unit has an aluminium scale printed 0 to 100 in 180° and a 25.4mm (1in.) solid aluminium diamond knurled knob. Dial diameter: 44mm (1.75in).

Order

HB45Y (Aluminium Dial)	£7.95
-------------------------------	-------

Epicyclic Ball Drive Type 4511F



A powerful friction drive with a reduction ratio of approx 6:1. Fits standard 6.3mm ($\frac{1}{8}$ in) shafts and knobs. Two grub screws for fixing shaft. Base of shaft tapped with two 8BA threaded holes for direct fixing of Rotary Pointer.

Shaft length: 26.7mm

Overall length: 47mm

Output torque: 1.8kgm.cm.(26oz.in) to 2.7kgm.cm.(38oz.in).

Input torque: <216gm.cm. (3oz. in.)

Order

RX42V (Ball Drive)	£2.95
---------------------------	-------

Miniature Type Ball Drive

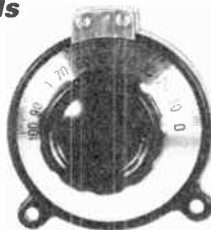


A small friction drive with a reduction ratio of approx 10:1. Fits standard 6.3mm ($\frac{1}{8}$ in.) shafts and knobs. Two grub screws for fixing shaft. Mounting bracket has two 8BA clearance holes on 20mm centres. Shaft length: 17mm. Overall length: 32.5mm. Output torque: 570gm.cm. (8oz.in.) minimum.

Order

HB42V (Mini Ball Drive)	£1.95
--------------------------------	-------

Vernier Dials



Heavy black bakelite base and black printed aluminium scale. Moulded knob has fluted grips and internal parts are phosphor bronze and brass for long life. No backlash, positive logging, "large" dial can be read to a tenth of each scale division. Planetary slow motion drive. Fits standard 6.3mm ($\frac{1}{8}$ in.) shaft. Scale marked 0 to 100 in 180°. Please note that only the "large" dial has a vernier scale.

Type	Dial diameter	Reduction ratio (approx.)
Vernier Dial Small	36mm	8:1
Vernier Dial Medium	50mm	6:1
Vernier Dial Large	70mm	10:1

Order

RX39N (Vernier Dial Small)	£2.95
RX40T (Vernier Dial Medium)	£3.95
RX41U (Vernier Dial Large)	£4.95

Pointer



A brass pointer sprayed gloss white. The carriage is designed to slide over scale or back plate 18swg thick. Length of pointer: 110mm.

Order

HB46A (White Pointer)	48p
------------------------------	-----

Ball Drive Pointer



A perspex pointer, transparent with a crimson hair line. Fits the ball drive type 4511F. Length of pointer: 86mm.

Order

HB47B (Ball Drive Pointer)	78p
-----------------------------------	-----

Cord Tension Springs

Springs have 3.2mm ($\frac{1}{8}$ in.) inside diameter loops at each end. Three sizes are available.

Length (between loop centres)	Number of coils
8mm ($\frac{5}{16}$ in.)	6
12.7mm ($\frac{1}{2}$ in.)	14
21.4mm ($\frac{27}{32}$ in.)	26

Order

HB48C (Spring Short)	9p
HB49D (Spring Medium)	9p
HB50E (Spring Long)	9p

Pulley



A plastic idler pulley manufactured in Celcon. They are strong and lightweight with a non-slip non-abrasive grip. To fit a 3.2mm ($\frac{1}{8}$ in) shaft. Outside diameter 12.7mm ($\frac{1}{2}$ in). Cord diameter when wrapped round pulley would be 9.5mm ($\frac{3}{8}$ in). Outside width 3.2mm ($\frac{1}{8}$ in). Width at top of groove 1.6mm ($\frac{1}{16}$ in). Width at base of groove 0.4mm ($\frac{1}{64}$ in).

Order

RX95D (Pulley 1/2in)	18p
-----------------------------	-----

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MICROPHONES

Base Station	188	Electret	189	Stands	191
Communications	188	Professional	190	Tie-Clip	189

LOOKING AT MICROPHONES

A microphone converts sound energy into an electrical signal, and as such is the first device in the audio reproduction chain (tape recorders, amplifiers, speakers). Unlike other parts of this chain microphones are not often seen in High St. shops, thus leaving large numbers of people unaware of their importance. Indeed, a microphone will probably place more characteristics on the final sound than any other item in the chain.

This implies that the choice of microphone is critical and that it is well worth while taking some trouble to establish which microphone(s) is best for the job in hand.

As a rule, the characteristic of the microphone is dependent on the 'cartridge' employed, and so little is gained by putting a cartridge in another mounting; unlike the domestic loudspeaker market where small companies are designing their own boxes around standard products.

A microphone consists of several parts. The actual work is done by the cartridge which is generally mounted on shock absorbing rubber supports. The cartridge is protected by grille and case, the cable usually leaving the rear end of the case. Additional parts may be included depending on the end product such as switches and transformers.

The dynamic microphone (sometimes called moving coil) is the converse of the normal loudspeaker. A diaphragm is fixed to a set of coils suspended between the poles of a magnet, and as the sound causes a diaphragm to move, current is induced in the coils by the magnet. The coil and diaphragm must be very light to allow the microphone to respond quickly to sound (ensuring a wide frequency response) and yet be strong enough to withstand jolts during its life. This is why high quality dynamics are expensive: the cost purely relating to the difficulty of manufacture of the diaphragm coil assembly. A small transformer is often used to adjust the output voltage and impedance to make the microphone easier to interface to other equipment.

One problem with dynamic microphones is that they are prone to pick up hum in the coil, and in view of the very low signal levels present this can be quite serious. Many microphones overcome this problem by mounting another coil next to the moving coil, but wound in the opposite direction. The outputs of the two coils are added either directly or by means of a transformer, and any hum induced in both coils will be cancelled out, since the induced hum will be of opposing phase. The fixed coil is often called a 'humbucker'.

In an electret condenser microphone, one of the plates is charged at the time of manufacture (a process involving heating and cooling, analogous to magnetisation) so that a large polarising voltage is not required. The output of these cartridges is very low, and a field effect transistor is usually used to amplify it. This small amplifier is usually mounted in the cartridge itself, and is powered by a 1.5V battery held in the handle of the microphone.

Impedance ratings define the load (usually a resistance) that the microphone is designed to operate into. This is important, because a wrong impedance load will not only alter the levels, but also affect the frequency response. Most professional microphones have quoted impedances of 200Ω or 600Ω. This means that they should be plugged into a tape recorder or mixer with an input resistance of about 600Ω; the difference between 600Ω and 200Ω not being critical. Most tape recorders are not satisfactory as they have input impedances of about 50kΩ and a matching transformer should really be purchased, although the trick of connecting a 680Ω resistor across each input jack often works.

Some care is necessary in order to obtain the best results. Most professional microphones employ balanced line outputs, and it is essential that all microphones are connected up in the same phase so that a positive sound pressure produces a positive voltage on the same input connector pins irrespective of the microphone used. If this is not observed the final sound will be very hollow and lack bass, due to the phase cancellation of signals from oppositely wired mics. If all the microphones are from one manufacturer no problem will exist, but it is worth the time to check if a mixture of makes are used.

The cable used to connect the microphones up should be of a high quality, preferably with a proper braided screen, and of the low noise type designed especially for microphones. This sort of cable employs a semi-conducting screen between the braid and the core insulator; this must be stripped well back out of the way since it exhibits a fairly low resistance and will affect the operation of the microphone. If the cable needs to be several yards long, then a low loss low capacitance type must be used if the treble frequencies are not to suffer. See cables section for suitable screened cables for low level audio applications.

TELEPHONE PICK-UP COIL



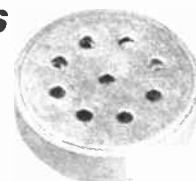
Small pick-up coil in black plastic moulding with rubber suction pad to attach to telephone. Will pick up conversations for recording. Connected to approx. 1m of lead terminated in a 3.5mm jack plug.

Order

LB92A (Phone Coil) 98p

MICROPHONE INSERTS

Crystal Microphone Inserts

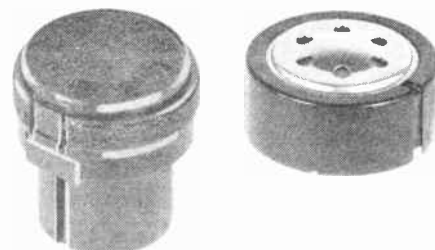


Two small crystal microphone inserts, one in a plastic box and one with a metal body. Size 25mm diameter x 10mm (11mm with plastic). Both require amplifier input impedance $\geq 1M\Omega$.

Order

LB93B (Crystal Mic In Plas) 48p
HY33L (Crystal Mic In Metal) 85p

Dynamic Microphone Inserts



Two dynamic coil microphone inserts, DU-3 is omnidirectional and is fitted in a round plastic case 22mm diameter x 11mm thick. Two solder pads provide means for connection to a screened cable. The screen should be soldered to the pad that is one end of the large circular band underneath.

Type UF-27 is unidirectional and contained in a black plastic body 30mm long x 37mm diameter overall. The rear of the body is stepped to facilitate insertion into some sort of rubber grommet or suspension. Connects via two solder pads. Both of these inserts require an amplifier input impedance of $\approx 50k\Omega$ to $100k\Omega$.

Order

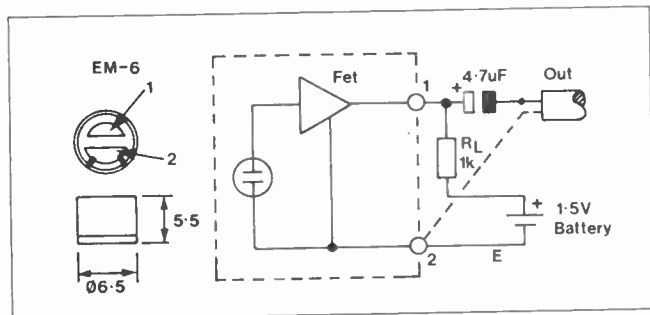
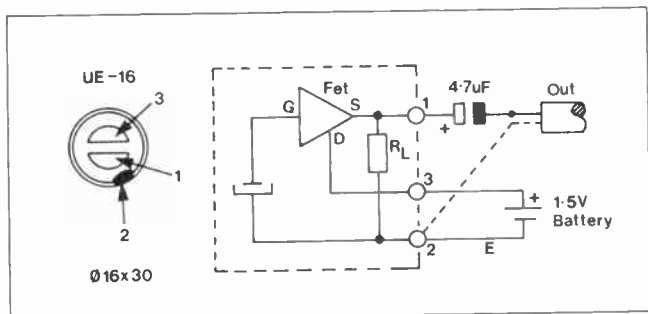
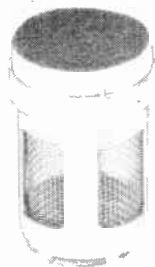
FK43W (Omni Insert Dyn DU3) 98p
FK44X (Uni Insert Dyn UF27) £2.95



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Electret Microphone Inserts

Type UE-16 is a unidirectional electret condenser microphone in a metal body 38mm long x 17mm diameter. Connection by solder pads.



Type EM-6 is a subminiature omnidirectional electret condenser microphone only 7.5mm diameter and 5mm thick. Input impedance of amplifier $\approx 50k\Omega$.



Order		
QY63T (Uni Insert Electret)	.....	£2.95
QY62S (Omni Insert Electret)	.....	95p

Lapel Microphone

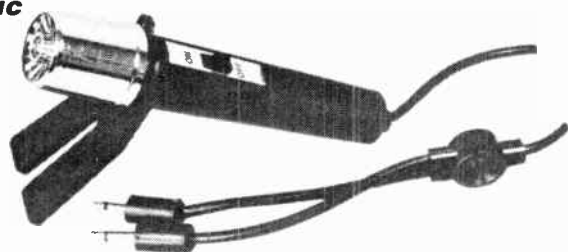


A low-cost crystal lapel microphone with lapel clasp and 900mm long lead terminated with a 3.5mm jack plug.

Order		
LB68Y (Lapel Mic)	.....	£1.40

CASSETTE MICROPHONES

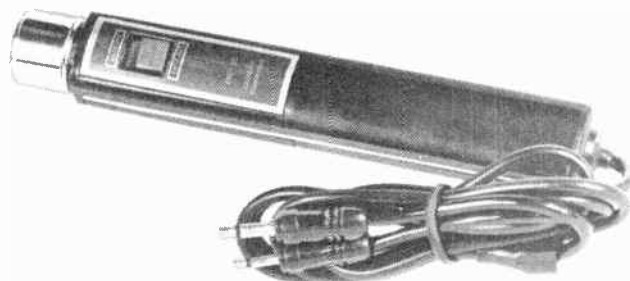
Dynamic



A dynamic microphone suitable for use with cassette recorders. Microphone has built-in on/off switch for remote control of recorder. Supplied with small plastic desk stand. Impedance: 200Ω . It is terminated in two jack plugs: a 2.5mm plug and a 3.5mm plug.

Order		
YB31J (Cassette Mic Jacks)	.....	£1.98

Condenser



An electret condenser microphone specially designed for use with cassette recorders. Its output level is higher than most dynamic types. Microphone has built in on/off switch for remote control of recorder. Lead is terminated in two jack plugs: a 2.5mm plug and a 3.5mm plug.

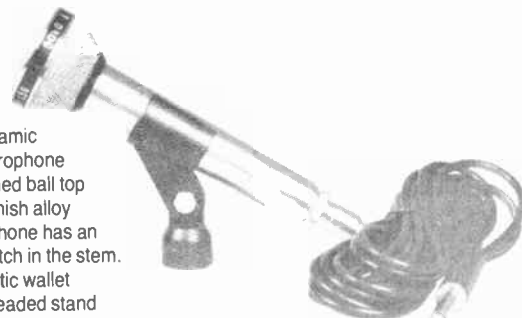
Specification:	
Sensitivity:	-63dB (516 μ V) \pm 3dB at 1kHz
Frequency response:	50 Hz to 16kHz
Impedance:	600 Ω

The microphone is supplied complete with battery (replacement type HP7).

Order		
YB33L (Electret Csette Mic)	.....	£2.95

LOW-COST MICROPHONES

Dynamic Ball Type



A high quality dynamic unidirectional microphone with a metal meshed ball top and a slim satin finish alloy stem. The microphone has an integral on/off switch in the stem. Supplied in a plastic wallet complete with threaded stand adaptor and 5m of lead terminated in a standard mono jack plug.

Specification:	
Frequency response:	80Hz to 14kHz
Impedance:	600 Ω and 50k Ω
Sensitivity:	600 Ω : -72dB (194 μ V) at 1kHz
	50k Ω : -53dB (1.8mV) at 1kHz
Size:	180 x 50mm dia.
Weight:	115gm

Order		
WF35Q (Dynamic Ball Mic)	.....	£11.95

Dynamic Stereo Pair



A pair of carefully matched omnidirectional dynamic microphones for stereo recording. Attractively styled with chrome plated plastic surround to the meshed top. Two desk stands are supplied and each microphone has 1m of lead terminated in a 3.5mm jack plug. An integral on/off switch is built into the stem. Supplied only in pairs.

Specification:	
Frequency response:	90Hz to 11kHz
Impedance:	200 to 600 Ω
Sensitivity:	-76dB (150 μ V) at 1kHz
Size:	160 x 43mm dia.
Weight:	50gm

Order		
LH87U (Dynamic Stereo Mics)	.....	£13.95

One Point Stereo Microphone

A rather novel all-in-one compact microphone having left and right channel transducers. A pair of electret condenser units are mounted each side of a cross T sub-assembly which outputs via a lower 3.5mm stereo jack plug portion. This also contains the battery type LR44 (supplied), and on/off switch. The sub-assembly would normally be plugged into the top of the stand also provided, but one could alternatively use a flying lead terminated in a 3.5mm stereo line socket. The stand has a hingeable foot which is closed flush to form a 'handle', or pulled out to form a 'stand'. It is advisable however to weight the foot with some suitable object to ensure the microphone is reasonably stable whilst 'free-standing'. The handle stand sends the microphone output via a 900mm long lead to one red and one black 3.5mm mono jack plug. A pair of foam windshields is also provided for the microphones, which are oppositely unidirectional to achieve maximum stereo separation.

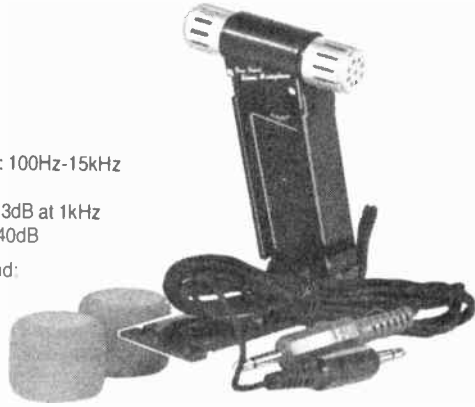
Specification:

Frequency response: 100Hz-15kHz
 Impedance: 50k Ω
 Sensitivity: -70dB \pm 3dB at 1kHz
 Signal noise ratio: >40dB

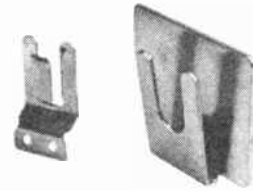
Dimensions with stand:
 Overall width 53mm
 Height 97mm
 Depth 15mm
 Weight 30gm

Order

FK45Y (One Point Stereo Mic) **£15.95**



Communications Microphone Holders



Clip-on holders to suit our standard communications microphones. Available for two-hole screw fixing (with 8mm long screws), or self-adhesive fixing.

Order

YW77J (Mic Hldr Screw-Fix) **28p**
YW78K (Mic Hldr Adhesive) **32p**

BASE STATION/PAGING MICROPHONE



A base station microphone with a built-in amplifier and slider volume control. The microphone is very unidirectional to limit feedback howls. A 9V PP3 battery is required (not supplied). Attractively designed, the microphone is attached to a slim, chromed gooseneck stem which is fixed to a heavy diecast base finished in gold hammertone. A brown windshield is supplied. A non-locking push to talk key and a further key marked 'lock' which locks the 'talk' key are integral with the base. A 3m lead is supplied containing three cores, red, black and a screened white core. There is an internal switch marked electronic/relay which may be set to suit circuit configuration. The white is the signal lead and the red and black are for switching. The internal interconnections with the various settings are as follows:

Internal switch at	Talk switch	Wires connected together
Electronic	Off	White, Black and Screen
Electronic	On	Red and Screen
Relay	Off	White and screen
Relay	On	Red and Black

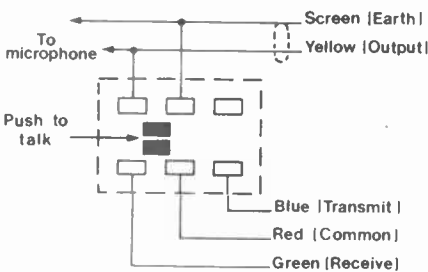
Specifications:

Frequency response: 300Hz to 7kHz
 Impedance: 1200 Ω at 1kHz at full volume
 Sensitivity: -55dB (1.6mV) at 1kHz
 Diameter of base: 113mm
 Height with gooseneck straight: 245mm
 Diameter of microphone cup: 22mm
 Weight: 700gms (with battery)

Order

XY72P (Base Station Mic) **£39.95**

COMMUNICATIONS MICROPHONES Standard Type



A hand-held communications type microphone with integral push-to-talk switch. Supplied with 2m of coiled black cable and a screw-on bracket so that the microphone can be hung up when not in use. Lead is supplied with prepared ends for connection of plug to suit your equipment. Yellow lead is the microphone signal wire and its screen is the earth. The push-to-talk switch is a change-over type where the red wire is connected to the green while in the 'normal' position; or the red is connected to the blue in the 'closed' position. Impedance 600 Ω , dynamic.

Order

WF05F (Communications Mic) **£6.95**

Hand-Held Power Microphone with Compressor

The output signal is carried on the yellow wire, with the screen at earth. The push-to-talk switch connects the red or common wire to the green wire in the 'normal' position, or the blue wire in the 'transmit' position. The internal 9V supply is only switched on when transmitting.

Specifications:

Output Level: -40dB (10mV)
 Impedance: 1k Ω
 Cable: 1.8m (6ft) 4 core screened lead
 Dimensions: 95 x 65 x 45mm
 Weight: 155gms with battery
 Supplied with connecting diagram.

Order

RK04E (Power Mic) **£14.95**



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TIE-CLIP MICROPHONES

Standard Tie-Clip Microphone

A smart high quality electret tie-clip microphone supplied complete with 3m of lead terminated in a standard 1/4in. mono jack plug, tie clip holder and 1.35V button battery. A knurled screw-on-cap seals the battery compartment, and the battery must be removed if the microphone is to be left unused for long periods in order to preserve battery life.

Specifications:

Impedance: 600Ω @ 1kHz
 Frequency response: 50 – 16kHz
 Sensitivity: -60dB ±3dB @ 1kHz (700μV)
 Polar pattern: Omni-directional
 Battery: H-B mercury 1.35V
 Dimensions: 33mm long x 18.5mm dia.
 Weight: 26gms

Order

LB69A (Tie-Clip Mic) £9.95

Miniature Tie-Clip Microphone



A very high quality sub-miniature electret tie-clip microphone with remote amplifier and battery in body of jack plug. Replacement batteries are available. Suitable types are RM400R HB PX400 MR08. Complete with 6m of lead terminated in a standard mono jack plug. Also supplied with one chromed tie-clip holder. Polar pattern is omnidirectional.

Specifications:

Frequency response: 50Hz to 16kHz
 Impedance: 600Ω
 Sensitivity: -64dB (480μV) at 1kHz
 Battery life: 6000 hours
 Size: 22mm x 8mm dia.
 Weight: 4gm

Order

YW71N (UM Tie-Clip Mic) £9.95

Uni-Directional Tie-Clip Microphone

A uni-directional electret tie-clip microphone supplied with 3m (10ft) of cable terminated with a standard 1/4in. mono jack plug. The base unscrews to gain access to the battery compartment, battery is supplied. An on/off is provided and the microphone has a 24mm dia. spherical wire windshield.

Specification

Frequency Response: 50 – 16kHz
 Output Level: -64dB @ 1kHz (470μV)
 Impedance: 600Ω
 Signal to Noise Ratio: 50dB @ 1kHz
 Battery: H-B mercury 1.35V
 Dimensions: 55mm long x 24mm
 Weight: 23g

Order

FV07H (Unidirect Tieclip Mic) £15.95

ELECTRET CONDENSER MICROPHONES

Medium-Cost Omni-Directional Electret Condenser Microphone



An omni-directional, medium cost electret condenser microphone with built in on/off switch. This microphone gives a remarkably good performance considering its price. Supplied with battery (replacement type AA), microphone holder, windshield and 3m of cable terminated in a mono 1/4in jack plug. Aluminium cylindrical body with lead that is not detachable.

Specifications:

Frequency response: 50Hz to 17kHz
 Impedance: 600ohms
 Sensitivity: -68dB (260μV) at 1kHz
 Power: 1.5V battery (fits inside microphone)
 Size: 180mm x 26mm dia
 Weight: 50g

Order

YK63T (Electret Mic ECM1066) £11.95

Medium Cost Unidirectional Electret Condenser Microphone



A unidirectional medium-cost electret microphone with built in on/off switch. Good value for the money. Supplied with a battery (replacement type AA), microphone holder, wind shield and 3m of cable terminated in a mono 1/4in jack plug. Aluminium body with lead that is not detachable.

Specification:

Frequency response: 50Hz to 16kHz
 Impedance: 600ohms
 Sensitivity: -68dB (260μV) at 1kHz
 Power: 1.5V battery (fits inside microphone)
 Size: 180mm x 26mm dia.
 Weight: 50g

Order

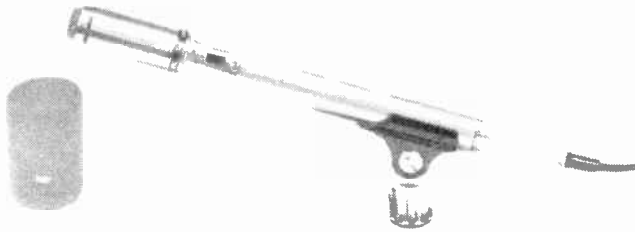
YK64U (Electret Mic ECM1067) £12.95

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PROFESSIONAL MICROPHONES Omnidirectional Electret Condenser Microphone



A very high quality omnidirectional electret condenser microphone having an extremely flat, wide frequency response. Microphone can be connected to suit high or low impedance inputs and has a brushed aluminium cylindrical body. Supplied with a battery (replacement type AA), threaded stand adaptor, windshield and 6m of cable terminated in a mono jack plug. The lead is connected to the microphone via a lockable plug which may be inserted in two ways to effect the impedance change.

Specifications:

Frequency response: 20Hz to 18kHz
 Impedance: 600ohms and 50kohms
 Output level: Low: -60dB (775µV) at 1kHz
 High: -48dB (2.6mV) at 1kHz
 Power: 1.5V battery (fits inside microphone)
 Size: 195mm x 22mm dia
 Weight: 150g

Order

YK65V (Professional Mic 1) £24.95

Stereo Electret Microphone



The microphone contains two perfectly matched unidirectional elements set at 120° to one another. The elements are contained in a rectangular stainless steel wire mesh grille with internal windshield. Supplied with battery (replacement type HP7), threaded stand adaptor and 3m of cable terminated in two separate standard mono jack plugs (right: grey, left: black). The lead is connected to the microphone via a lockable plug.

Specifications:

Frequency response: 50Hz to 16kHz
 Impedance: 600Ω
 Sensitivity: -68dB (260µV) ±3dB at 1kHz
 Power: 1.5V battery (fits inside microphone)
 Size: 200mm long. (Head 57 x 38mm)
 Weight: 185g

Order

YK68Y (Stereo Electret Mic) £24.95

Unidirectional Electret Condenser Microphone



A very high quality unidirectional electret condenser microphone, with all general details the same as Professional Mic 1.

Specifications:

Frequency response: 20Hz to 18kHz
 Impedance: 600 ohms and 50k
 Output level: Low: -62dB (590µV) at 1kHz
 High: -48dB (2.6mV) at 1kHz
 Power: 1.5V battery (fits inside microphone)
 Size: 210mm x 34mm dia
 Weight: 125g

Order

YK66W (Professional Mic 2) £29.95

Ultra-Directional Electret Condenser Microphone



A very directional electret condenser microphone which can pick up distant sounds only from the direction in which it is pointed. A 240mm long windshield is supplied for outdoor use. The directional stick, 332mm long x 12mm diameter with chrome bezels at each end, screws onto a 122mm long x 21mm diameter base with on/off switch. Supplied with battery (replacement type AA), threaded stand adaptor, windshield and 1.5m of cable terminated in a standard mono jack plug.

Specifications:

Frequency response: 50Hz to 16kHz
 Impedance: 600Ω
 Sensitivity: -65dB (430µV) at 1kHz (0dB = 1V/µbar)
 Power supply: 1.5V battery (fits inside microphone)
 Sound pressure level: 125dB max.
 Signal to noise ratio: >40dB at 1kHz
 Size: 140 x 21mm dia
 Weight: 150g

Order

YK67X (Professional Mic 3) £29.95

Professional Cardioid Microphone



A very high quality dynamic moving coil microphone with a wide uniform response curve. The microphone has a built-in spherical windshield and a self-contained filter that controls explosive breath sounds ('pop') and wind noise in outdoor locations. The cartridge pick up pattern minimises background noise and clearly picks up desirable sounds, and the pick up cartridge is shock-proofed for protection against mechanical noise such as handling noise and floor noise. The microphone comes with instructions on how to use it with a balanced line. Complete with 6 metres (20 ft) of cable with 3 pin XLR type connector for microphone and 1 mono jack plug.

Specifications:

Frequency response: 50Hz to 15kHz
 Impedance: 500Ω
 Sensitivity: -71dB (200µV) at 1kHz
 Size: 160mm x 52mm dia
 Weight: 310g

Order

YK69A (Professional Mic 4) £39.95

Broadcast Quality Microphone



A very high quality dynamic microphone with a precise cardioid uni-directional polar sound pattern and an extremely smooth frequency response. The robust moving coil element is supported in an all-metal body, with metal mesh ball windshield, finished in satin grey. Incorporates on/off switch. Accessories include 5 metres of balanced screened cable terminated with a Cannon-type connector for

the microphone and a mono 1/4in. jack plug, a foam windshield cover, microphone holder including 5/16in. to 3/8in. adaptor, and soft carry case.

Specifications:

Frequency response: 50Hz – 16kHz ±5dB
 0° axis @ 7.5cm
 –76.5 ±1dB (109µV)
 Sensitivity:
 Impedance: 200Ω
 Dimensions: 165mm long x 52mm dia.
 Weight: 270gm (without cable)

Order
YJ75S (Broadcast Qual Mic) £54.95

MICROPHONE ACCESSORIES

Microphone Windshield

Functionally styled, controlled-density foam windshield that fits most slimline dynamic or electret microphones. Essential for suppressing explosive breath sounds, squeals and booming effects.

Available only in black.

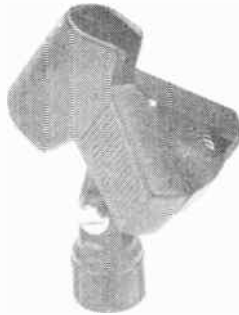


Order
LB35Q (Mic Windshield) 58p

MICROPHONE HOLDERS

Universal Microphone Holder

This microphone holder features spring-loaded jaws to hold any size microphone 5/16in. threaded base.



Order
RK92A (Universal Mic Holder) £1.98

Microphone Holder 622

A microphone holder suitable for (YJ75S), Electret Cassette microphone (YB33L), and Professional Cardioid microphone (YK69A). 5/16in. threaded base.



Order
RK93B (Mic Holder 622) £1.40

Microphone Holder 614

A microphone holder suitable for the Electret Condenser microphones YK63T and YK64U, professional microphones YK65V, ultra directional microphone YK67X and the stereo electret microphone YK68Y. 5/16in. threaded base.



Order
FV08J (Mic Holder 614) 98p

Microphone Holder 600

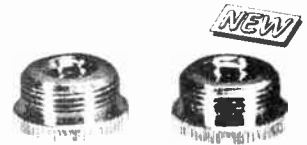
Microphone holder suitable for use with the dynamic ball microphone WF35Q and uni-directional Electret Condenser microphone YK66W. 5/16in. threaded base.



Order
FV09K (Mic Holder 600) 98p

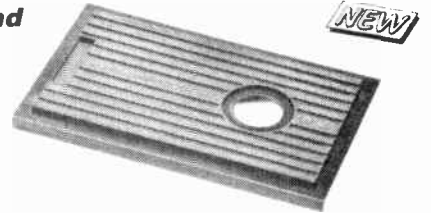
Microphone Adaptors

Solid metal adaptors which enable microphone holders threaded to 5/16in. to be used with accessories having 3/16in. or 3/8in. threads.



Order
FV11M (5/16 inch Adaptor) 48p
FV12N (3/8 inch Adaptor) 48p

Microphone Stand



Black plastic rectangular microphone stand with non-slip feet which can be used with any microphone holder having a 5/16in. threaded base, but must have, in addition, one of the adaptors described above used as a fixing screw. Size: 106 x 66mm.

Order
FV10L (Microphone Base) 98p

Gooseneck Microphone Stands

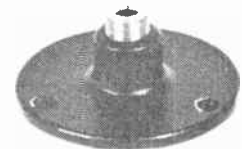


Brightly chromed gooseneck microphone stands, threaded to accept standard microphone carriers. Base is internally threaded.

Available in three lengths, 8in., 13in. and 19in.

Order
YW72P (Gsneck Mic Stand 8in) £2.40
LH88V (Gsneck Mic Stnd 13in) £2.80
WF36P (Gsneck Mic Stnd 19in) £3.20

Metal Surface Mounting Gooseneck Base



An all metal base to suit our goosenecks. Single hole fixing, supplied with one 19mm No.8 countersunk woodscrew. Unscrew brass insert to fix. Size 26mm high x 65mm dia. Finished in texture finish black.

Order
YW74R (Metal Gsneck Base) £2.95

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Metal Hidden-Mounting Gooseneck Base

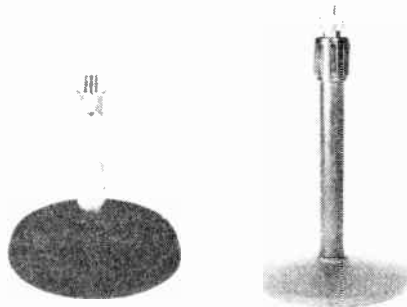


An all-metal base to fit our goosenecks. Threaded stud is welded to a flat base (60 x 60mm) with fixing centres on 48mm centres (4BA (M4) clearance). Cadmium plated. Panel cut-out: 16mm dia.

Order

WF37S (Bkt For Gsnk Stand) £1.98

Cast Base Microphone Stand

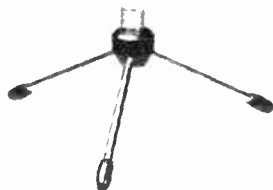


A table-top microphone stand with a chrome plated rod screwed into a heavy diecast, textured finish base. Standard thread at top suits stand adaptors supplied with our microphones and most others and an adaptor for 3/8in. threads is also supplied. Extra height type has a telescopic section. Height standard type: 95mm, extra height type: 325mm. Base diameter 100mm.

Order

YW75S (Cast Base Mic Stand) £4.95
YW76H (Extra Hgt Mic Stand) £6.95

Tripod Microphone Stand

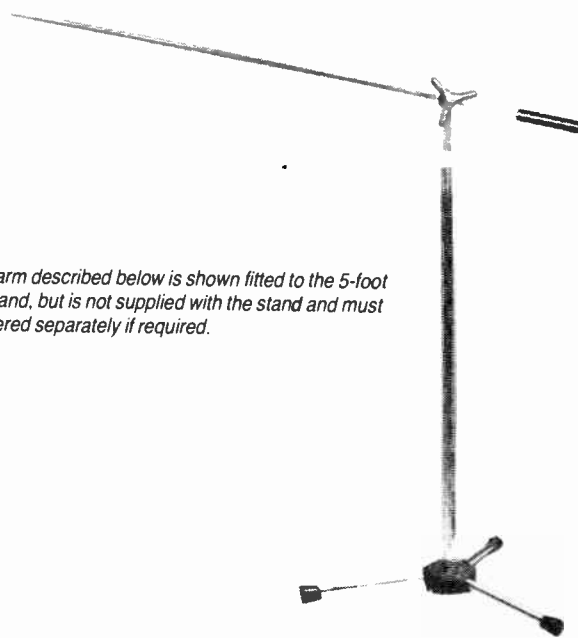


A table-top microphone stand. Chrome plated tripod legs hinge outward to give firm base. Standard thread at top suits stand adaptors supplied with our microphones and most others.

Order

LB96E (Table-Top Mic Stand) £2.95

5-Foot Microphone Stand



Boom arm described below is shown fitted to the 5-foot Mic. Stand, but is not supplied with the stand and must be ordered separately if required.

A floor-standing microphone holder with black moulded strong plastic base into which heavy chromed feet plug. Each foot ends 275mm from centre of stand providing a very rigid base. For stowing, feet are removable and plug into top of base. Stand itself is chromed and stands 820mm high with second section fully collapsed. Second section extends up to 1500mm, but may be locked to any length with friction grip. Lower section and feet dia. 19mm. Upper section dia. 12.7mm. Top has brass thread to accept standard microphone cradle.

Order

XB45Y (5-Foot Mic Stand) £14.95

Boom Arm

A boom arm for use with our 5-foot Mic Stand or almost any other floor stand. Boom is chromed and has a heavy counterweight. It can be rotated through 360° and can be set at any angle. Total length of arm: 1m. Boom length is adjustable up to 878mm from centre of stand. End of boom arm is threaded to accept standard microphone cradle (stand adaptor).

Order

XB46A (Boom Arm) £9.95

**FAST SERVICE
LOWEST PRICES**



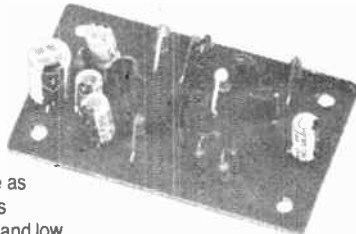
MUSICAL AND EFFECTS

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PRE-AMPLIFIER MODULES EQ2S Mono



A tiny ready-built pcb suitable for use as a preamplifier for magnetic cartridges (RIAA), tape heads (NAB response) and low level microphones. Two will be required for stereo. Uses two silicon transistors.

Specifications:

Gain (at 1kHz): Phono: 34dB (5mV input – 240mV output)
Response curve RIAA
Tape: 33dB (5mV input – 220mV output)
Response curve NAB
Flat: (Microphones etc.) 38dB (3mV input – 230mV output)
Max output: 2.5V (with 30mV input)
Input impedance: $\pm 50k\Omega$ (approx)
Output impedance: $\pm 5k\Omega$ (approx)
Power supply: 10V $\pm 2V$ at 1mA (e.g. 9V battery PP3)
Supply range: 8 – 12V
Size: 60 x 35 x 20mm
Fixing centres: 50 x 25mm x 6BA clear.

Supplied with connecting instructions.

Order

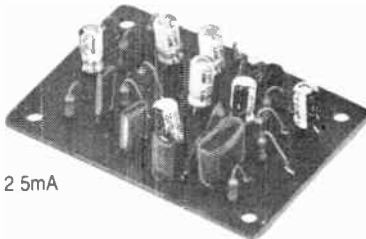
LB97F (Pre-Amp EQ2S) £4.95

Tone Control Module Mono TC-2S

A monophonic tone control board comprising a two transistor Baxandal type tone control circuit with input buffer. It additionally requires two linear 50k Ω potentiometers to operate.

Specification:

Bass boost: +18dB @ 100Hz
Bass cut: -12dB @ 100Hz
Treble boost: +17dB @ 10kHz
Treble cut: -13dB @ 10kHz
Gain, 'flat': 1.5dB @ 1kHz
Input impedance: $\pm 50k\Omega$
Output impedance: 5k Ω (approx)
Power supply: +10VDC $\pm 2V$ at 2.5mA
Supply range: 8 – 12V
Dimensions: 65 x 45 x 23mm

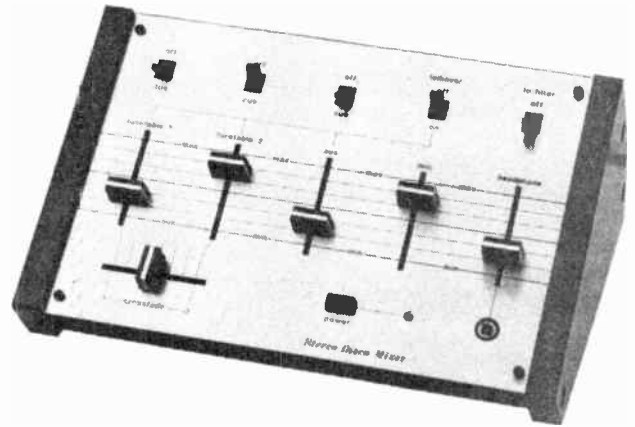


Supplied with connecting instructions.

Order

FM10L (TC Module TC-2S) £4.95

MIXER Stereo Disco Mixer MM-8



A professional quality mixer for disco applications, the MM-8 allows two stereo turntable pickups to be mixed with an auxiliary stereo input or with a talk-over facility. Each input has its own fader/level control, with a crossfade control for transferring/mixing between the two turntable channels. A headphone socket is provided for monitoring the final output, or turntables 1, 2 or Aux independently via the cue switches. A low-pass filter is included. Overall size 260mm wide x 185mm deep x 125mm high, with sloping front panel.

Order

AF99H (Stereo Disco Mixer) £63.95

GRAPHIC EQUALISERS

Stereo Graphic Equaliser

A ten octave stereo graphic equaliser which is inserted between an amplifier's pre-amp output and power-amp or main input. The equaliser includes a master volume control, and has an additional line input for ancilliary equipment other than the pre-amplifier, and separate tape in/out lines are also provided. Front panel switches are accompanied by function indicators. The ten octave bands have their centre frequencies operating at 30Hz, 60Hz, 120Hz, 240Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz, and 16kHz.

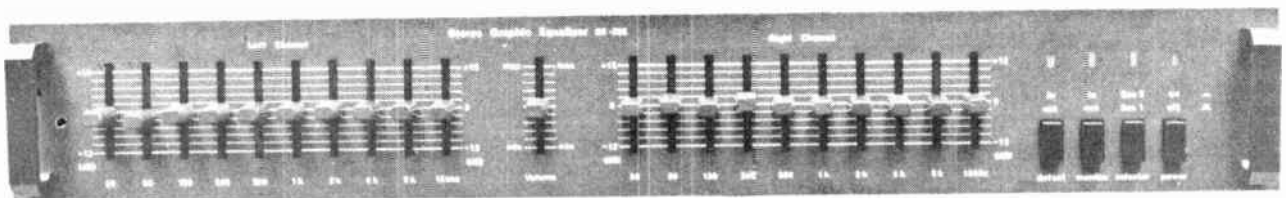
Specifications:

Frequency response, flat: 5Hz to 100kHz ± 1.0 dB
Tone control range: ± 12 dB for each octave
Harmonic distortion: 0.05% at 0.775V (0dB)
Signal/noise ratio: 80dB
Gain, flat: 0dB
Input impedance: 100k Ω
Output impedance: 600 Ω
Inputs: 3; Aux, Tape & Monitor
Outputs: 2
Power in: 240VAC/50Hz

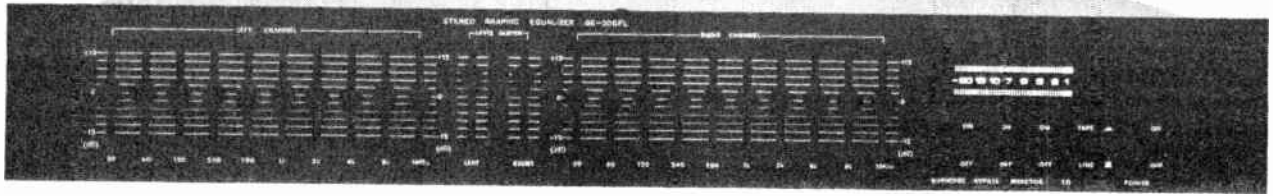
Dimensions: Width: 446mm (17.5in) Depth: 204mm (8in) Height: 76.5mm (3in)
Weight: 2.5kg (5.5lbs)

Order

AF60Q (10 Ch Graphic Equal) £84.95



Stereo Graphic Equaliser with Peak Level Meters

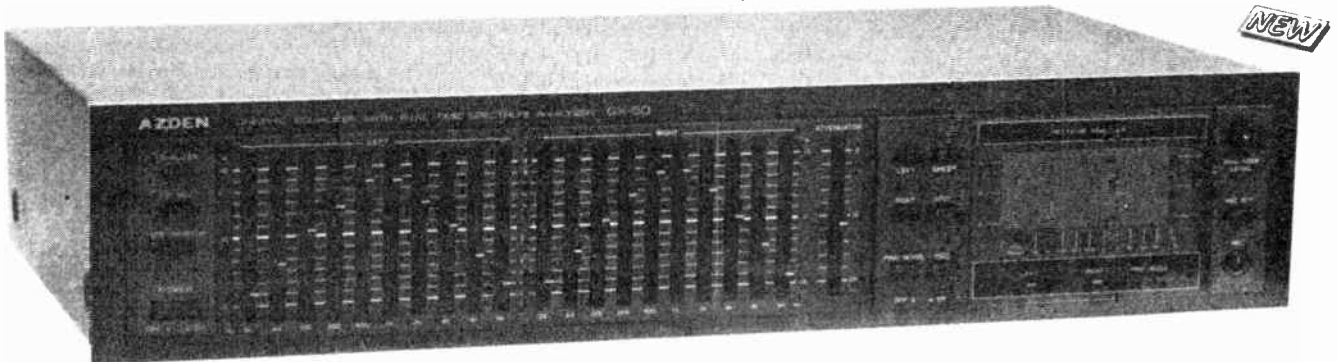


A ten octave stereo graphic equaliser identical with the above, but having LED peak level indicators in place of the switch function indicator lamps. The peak level meters cover the range -15dB to 0db, and then to +3dB (overload).

Order

AF27E (10 Ch Equaliser VU) £99.95

Stereo Graphic Equaliser With Real Time Spectrum Analyser



A smart, high quality stereo graphic equaliser having ten slider controls for each channel, covering ten octaves at 32Hz, 64Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz centres. The sliders have a centre click-stop action and provide up to 12dB of boost or cut. In addition, there is a common output attenuator control for adjusting the final output level if required. Push-button front panel switches provide for 'straight through' or equalised signals to the main amplifier and also independently for a tape recorder, as well as a tape monitor function. Signal connections are via four pairs of phono sockets at rear for the pre-amp to main-amp signal path, and for stereo tape record and playback.

Spectrum Analyser

The special feature of this equaliser is the spectrum analyser, which uses a fluorescent bar graph display to indicate the level of all ten frequency bands plus the full range output level. The analyser can display the response of either left or right channels independently or together as a monophonic equivalent. In addition, the analyser can be used to measure the frequency response and sound level of the speakers and the listening room. This is probably the single most useful feature of the analyser in that it is possible for the programme tone to be adjusted to compensate for the loudspeaker and room acoustics. By plugging in the electret condenser microphone supplied, the analyser can be made to compare frequencies in the speaker sound output spectrum. A sine wave or pink noise generator can be selected to output to the main amplifier via the equaliser controls, at either left or right channels, and the analyser will display the frequency response accordingly. The sine output can be frequency swept automatically or manually in steps. The ability to equalise programme material prior to recording also has many advantages, for example to enhance a particularly weak area in the tonal response when re-recording, so that the material can be played back with another system ready equalised. Another example is to make recordings where particular frequency response defects of another sound system can be compensated for at the recording stage. The response of such a system could be determined by using the spectrum analyser with microphone input to determine where the frequency spectrum needs to be trimmed. The spectrum analyser incorporates an input level control to set the bargraph range, and a switchable attenuator at the microphone input.

Specifications:

Frequency response, flat:	10 to 35kHz \pm 1.0dB	
Tone control range:	\pm 12dB each octave	
Harmonic distortion:	0.005% @ 1V	
Signal/noise ratio:	90dB	
Gain, flat:	0dB	
Inputs	Sensitivity	Impedance
Line in	150mV	47k Ω
Tape playback	150mV	47k Ω
Output		
Line out	150mV	47k Ω
Tape record	150mV	47k Ω
Output attenuator range	0db to -20dB	
Sine signal level	80mV	
Pink noise level	30mV	
Power in	240V AC/50Hz, 150mW	

Dimensions:

Width	Depth	Height
430mm (17in.)	227mm (9in.)	91mm (3 $\frac{5}{8}$ in.)
Weight: 3.8kg (7.5lbs)		

Supplied with electret condenser microphone with clip stand and 3m of screened lead terminated in mono standard 1/4in. jack plug. Requires one size AA battery not included.

Also supplied with two 1 metre long stereo screened leads terminated in colour identified twin phono plugs at each end.

Order

XG83E (G Equaliser + Analyser) £129.95

ECHO CHAMBERS Standard Type



superior quality echo chamber at a very low price. Designed for use with microphones or any electronic musical instrument, this echo chamber is supplied with a tape cartridge which will last substantially longer than an ordinary echo chamber with loop tape. The unit is mains operated and is finished in hard-wearing black textured plasticised cloth, with carrying handle and front panel is high gloss anodised aluminium. The inputs are standard mono jack sockets, one has a low impedance: 600 Ω and the other has a high impedance: 50k Ω making it suitable for guitars and indeed by using the input volume control a very wide range of inputs can be accommodated (for instance the main output of a mixer could be fed in here so that echo could be added to the composite signal). Two outputs on mono jack sockets are also provided for feeding onto a power amp, one output gives high volume and the other gives a low volume, slightly less than a tenth that of the high output.

A balance control is provided which is continuously variable between straight-through sound only (no echo) and echo only. A repeat control is provided which adjusts the loss in the volume of each repeat of the same sound (i.e. it sets how fast an echo dies away) and a control is provided which varies the speed of the tape and therefore the time between repeats of the echo.

The tape cartridge which is an endless loop fits into the rear of the chassis and is hidden by the back of the cabinet. This rear panel also incorporates a standard mono jack socket into which a foot switch, may be plugged. The switch will then instantaneously turn the echo effect on and off without affecting the straight through signal.

Overall size: 270 x 165 x 130mm

Order

XB33L (Echo Chamber)..... £79.95

Tape For Echo Chamber

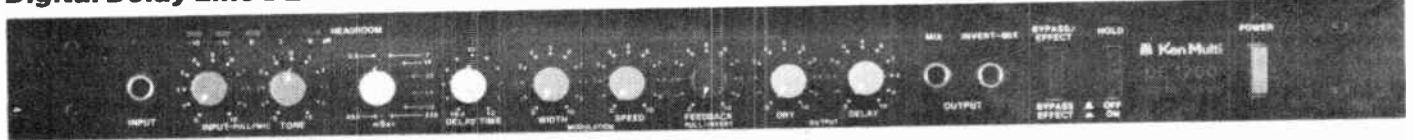


A replacement endless loop tape cartridge for use with our echo chamber. Size: 85 x 70 x 12mm

Order

LB67X (Echo Chamber Tape)..... £5.95

Digital Delay Line DE-1200



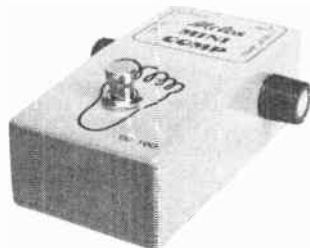
The DE-1200 is a digitally controlled solid-state delay line unit for the stage. A wide variety of effects, e.g. Slap-Back, Doubling, Flanging, Chorus, and Long Delay can be achieved, made possible by the broad range of delay times from 1.75 to as much as 900 milliseconds. A delay range selector switch chooses the operating range for a continuously variable delay time control.

The input level control is dual function, where the knob is simultaneously a pull/push switch to select low or high level inputs, which may use either a front panel or a rear panel jack socket. Plugging in to the front panel socket overrides the input from the rear.

From here the signal is outputted to a 'direct' output jack, whilst at the same time continuing on to an active treble control which feeds the digital delay processing circuit. In addition the delay time can be modulated by a Low Frequency Oscillator which has a comprehensive control range. Feedback can be provided between the delay line output and input which may be inverted or not.

Final outputs are available in phase as well as in inverse form. Control input jacks are included for two foot pedal switches for 'Hold' and 'Bypass' switching. 'Hold' has the effect of increasing the delay time to as much as 2.7 seconds for echo effects, whilst 'Bypass' simply bypasses the delay line entirely for a 'direct' output.

COMPRESSOR



A foot-operated compressor for guitars for sound level limiting. A distortion free sustain is obtained by turning up the level control. A foot-operated switch is provided so that sound may be switched from compressed to straight through or vice versa.

Order

YB88V (Mini Compressor)..... £29.95

Echo Machine EM-006



A high quality echo chamber using solid state bucket-brigade delay lines. The unit is finished in matt black, and the inputs are standard mono jack sockets. The Mic socket is the input jack for low impedance (-46dB 10k), and the Instrument socket is the input for an instrument or line output of hi-fi, organ, synthesiser etc. (-20dB 220k). There is a footswitch jack on the rear for a remote control switch.

The delay time control is variable between 20 and 200msec and there are three selections of output level (0, -20 and -40dB) to enable connection to any amplifier. There is also a peak level indicator which will show when the input level is excessive and likely to cause distortion.

The balance control sets the mixture of echo and straight through sounds, with no echo at 'direct', total at 'delay' and equal at the centre position. The repeat control sets the number of repetitions of echo sound, the dial being rotated clockwise to increase the speed. Overall size: 220 x 150 x 55mm

Order

XG30H (BBD Echo EM-006)..... £79.95

Specifications:

Delay Time		1.75 - 900ms
Freq Response,	delayed	30Hz - 8kHz
	direct	30Hz - 20kHz
Input impedance,	line	500kΩ
	mic	5kΩ
Gain,	Line in	0dB
	Mic in	30dB
Output impedance		<10kΩ
Tone control slope, max		12dB at 6kHz
Distortion		<0.2% (<1% delayed)
Power Supply:		240VAC/50Hz

Dimensions:	Width:	Depth:	Height:
	482mm (19in)	223mm (8¾in)	44mm (1¾in)
Weight:	3kg (6.5lbs)		

Order

AF98G (DE1200 Digital Delay)..... £199.95

ASHLEY ACOUSTIC GUITAR TRANSDUCERS

A range of small easily fixed transducers, for use with acoustic guitars. The units offer wide frequency responses comparable with the best microphones. The onset of acoustic feedback compared to a microphone is considerably delayed, and they have a very high output. They are very convenient to use; simply attach to the bridge close to one end of the saddle using the self-adhesive material supplied.

The material allows lifting and repositioning of the transducer without damage to the guitar. The unit may be fixed to its bevelled face to give an alternative bass response. Size: 28 x 10 x 8mm. Two types are available.

Professional



The top of the range model with an exceedingly smooth frequency response.

Order

YL08J (Pickup Transl.AJ21)..... £29.95

PHONE NOW 0702 552911 

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Phone before 2pm for same day despatch.

Standard



This model has a slightly emphasised treble response and is recommended for acoustic guitars in loud electric groups. Supplied with short lead terminated in a standard mono jack line socket.

Order

YL09K (Pickup Transl.AJ51) £24.95

STRAP BUTTON



A button for guitar straps; made from solid brass bar and heavily chrome plated.

Order

LB98G (Strap Button) 48p

GUITAR PICKUPS

Crystal Type



A low cost crystal unit which clips onto the sound board of an acoustic guitar. A volume control is provided and 1.4m of lead terminated in a standard mono jack plug. No other connections required. Just plug into amplifier and play.

Order

YB40T (Cry Guitar Pick-Up) £4.95

Magnetic Steel Strings



A pick-up for steel string guitars. Unit clamps onto sound board under strings, with an adjustable clamp, so that each of the six holes in the microphone unit is below one string. The control unit is fixed to the microphone unit by a long adjustable clamp and incorporates a volume and tone control. The lead which is detachable is 3m long terminated at one end with a 3.5mm jack plug to suit socket on control unit and a standard mono jack plug at the other end for connection to amplifier input. Heavily chromed finish. Contains two ceramic magnets, 3.4k Ω impedance. Supplied with instructions.

Order

YB42V (Steel Mag Pick-up) £11.95

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OPTO-ELECTRICAL

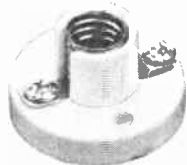
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MES LAMPHOLDERS Batten Holder

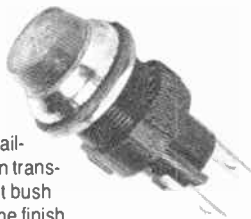
An MES bulb holder in a bakelite base, with screw terminals.
Dimensions:
Dia. of base: 31mm.
Fixing centres: 23mm.
Total height: 18mm



Order
RX86T (MES Batten Hldr) 32p

Panel Type

MES lampholder. Available with red or green transparent lens. The front bush has a polished chrome finish. Requires a 19mm panel cut-out.



Order
RX60Q (Holder MES Green) £1.45
RX61R (Holder MES Red) £1.45

LES LAMPHOLDERS Domed Type

A panel lampholder with smart chromed bezel and domed translucent polycarbonate cap available in five colours. Panel fixing requires 10mm dia. cut out and, when fixed, lamp can be removed from either side of panel. Dia. of bezel: 12mm. Colours available Blue, Green, Red, White and Yellow.



Order
RX76H (Dmd LES Lhdr Blue) 38p
RX77J (Dmd LES Lhdr Green) 38p
RX78K (Dmd LES Lhdr Red) 38p
RX79L (Dmd LES Lhdr White) 38p
RX80B (Dmd LES Lhdr Yellow) 38p

Flat Top Type

A panel lampholder with smart chromed bezel and flat topped transparent polycarbonate cap available in three colours. Panel fixing requires 11mm dia cut-out and, when fixed, lamp can be removed from either side of panel. Dia. of bezel: 14mm. Colours available: Blue, Green and Red.



Order
RX67X (Flt-Tp LES Lhdr Blu) 38p
RX68Y (Flt-Tp LES Lhdr Grn) 38p
RX69A (Flt-Tp LES Lhdr Red) 38p

Fluted Lampholder

A panel lampholder with fluted translucent polycarbonate cap available in four colours. Panel fixing, requires 9.5mm (3/16in.) cut-out. Dia. of bezel: 13.5mm. Colours available: Amber, Clear, Green and Red.



Order
FF66W (Fluted Lhdr Amber) 35p
FF67X (Fluted Lhdr Clear) 35p
FF68Y (Fluted Lhdr Green) 35p
FF69A (Fluted Lhdr Red) 35p

LES Lamp Covers

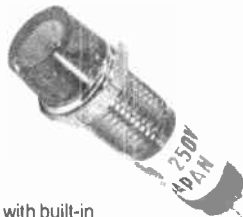
High temperature, coloured translucent, silicone rubber covers for 5mm diameter bulbs. The covers stretch over the glass bulb on LES types and our Wire Bulb and will withstand the high temperature reached by the bulb. The covers also offer a very inexpensive method of mounting the bulb to a panel (up to 18swg thickness). Panel cut-out required 6.3mm (1/4in.). Overall size 12.5 x 9mm dia. Available in Amber, Blue, Green, Purple, Red, White and Yellow.



Order
YY00A (LES Cover Amber) 9p
YY01B (LES Cover Blue) 9p
YY02C (LES Cover Green) 9p
YY03D (LES Cover Purple) 9p
YY04E (LES Cover Red) 9p
YY05F (LES Cover White) 9p
YY06G (LES Cover Yellow) 9p

NEON INDICATORS Miniature Round Panel Type

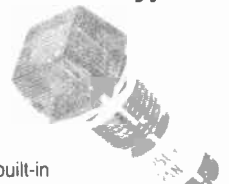
Moulded body with built-in resistance for 250V use. Red, Green or Amber lens. Requires a 7mm mounting cut-out in panel. Overall dimensions: 33mm long, 8mm diameter round lens.



Order
BK52G (Min Neon Red) 45p
BK53H (Min Neon Green) 45p
BK54J (Min Neon Amber) 45p

Small Square Panel Type

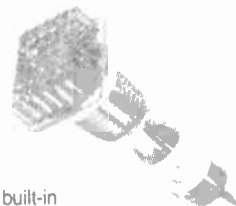
Moulded body with built-in resistance for 250V use. Red, Green or Amber lens. Requires a 10mm mounting cut-out in panel. Overall dimensions: 38mm long, 12mm square lens.



Order
RX82D (Pan Neon Amber) 38p
RX83E (Pan Neon Red) 38p
BK51F (Pan Neon Green) 38p

Square Panel Type

Moulded body with built-in resistance for 250V use. Green or Red lens. Requires a 10mm dia. mounting hole in panel. Lens size 15 x 12mm, overall length 43mm.



Order
RX81C (Square Neon Red) 38p
RX98G (Square Neon Green) 38p

Chrome Bezel Type

Chrome-plated metal body with built-in resistance for 250V use. Red or Green lens. Requires a 9mm mounting cut-out in panel. Overall dimensions: 41mm long, 11mm diameter round chrome bezel.



Order
BK55K (Chrome Neon Red) 78p
BK56L (Chrome Neon Green) 78p

BULBS Wire-Ended Neon Type

Wire-ended neon indicator lamp. For 250V operation use a series 270kΩ 1/4W resistor. Bulb diameter 5.95mm. Bulb length 21.5mm (max).



Order
RX70M (Wire Neon) 10p

Wire-Ended Filament Type



A wire-ended filament type bulb, dia. 5mm, 12V, 0.08A, 0.96W, 2 Lumens (nom). Nominal life: 5000 hours.

Order

WQ13P (Wire Bulb 12V) 28p

Tubular LES Type



Two types are available
6V and 12V. 6V, 0.06A, 0.36W, 1.0 Lumens (nom). Nominal life 5000 hours.
Post Office type 41C. 12V, 0.08A, 1W, 2 Lumens (nom). Nominal life 5000 hours.

Order

WL74R (LES Bulb 6V) 20p
WL75S (LES Bulb 12V) 20p

Round MES Type



Volts	Watts	Amps	Nominal lumens	Nom. life (hours)
3.5	0.5	0.15	1.5	5000
6	0.24	0.04	0.45	5000
6	0.6	0.1	3	1000
6.5	1.95	0.3	12	3000
12	1.2	0.1	5	5000
12	2.2	0.18	11	3000
24	2.8	0.12	11	3000

Order

WL76H (Bulb MES 3.5V) 32p
WL77J (Bulb MES 6V 0.24W) 32p
WL78K (Bulb MES 6V 0.6W) 30p
WL79L (Bulb MES 6.5V) 30p
WL80B (Bulb MES 12V 1.2W) 30p
WL81C (Bulb MES 12V 2.2W) 30p
WL82D (Bulb MES 24V) 32p

LOW VOLTAGE FLUORESCENT LAMPS Hand-Held Fluorescent Tube



A smart black rubber cased 12V fluorescent tube. Bright white light, but only 10W consumption. With swivel hook and leads that plug directly into a cigar lighter socket. No motorist should be without one. Also invaluable during power cuts e.g. three of these could be run from one fully charged car battery for up to 15 hours before recharging.

Order

LQ10L (Portable Lamp) £6.95

Dual Fluorescent Lamp



An attractive twin tube lampholder with two 12V 8W fluorescent tubes. White plastic case with clear plastic ribbed diffuser and on/off switch. Supplied with 90cm of twin flex for connection to 12V battery (red stripe to positive). Overall size: 370 x 65 x 41. Suitable for boats, caravans etc.

Order

XY71N (Caravan Lamp) £9.95

Replacement Tube

A 12V 8W fluorescent tube for use as replacement in our Caravan Lamp. It also suits many other caravan and boat lamps.

Order

LQ11M (12V Tube) £1.98

Reader's Light



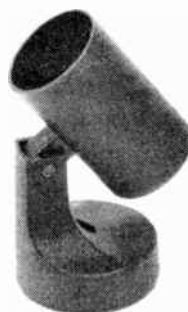
A small, portable battery powered lamp that may be either free standing or alternatively clipped to a shelf or the edge of a panel etc. Can be used to help illuminate the interior of an instrument case or similar confined space to provide close-up, on the spot lighting for fiddly soldering jobs, or in any situation where you need a small torch, but at the same time need both hands free. The lamp uses four AA size batteries (not supplied) contained in the base and providing stability in the free-standing mode. The integral clamp will open to 40mm maximum and is capable of gripping shelves, edges of tables etc. up to 30mm thick. A flush on-off slide switch is provided plus a 2.5mm jack socket for an external 6V supply. The lamp proper is mounted at the end of a jointed arm which has a rotatable hood, and uses an easily replaceable MES bulb. Overall dimensions, folded – 120 x 45 x 60mm. Maximum reach of arm – 208mm.

Order

FM99H (Reader's Light) £4.25

Free-Standing Lampholder

A lampholder suitable for use with Spot Lamps (not suitable for ordinary domestic light bulbs). BC fitting only. Holder may be swivelled up and down and round and round, and is fixed to a circular black plastic base with two fixing holes and grommetted hole for cable. Base diameter: 75mm. Fixing centres: 58mm.



Order

YB29G (Spot Holder) £4.95

Gooseneck Lampholder



A very flexible gooseneck lampholder fitted with a 12V 5W bulb (replacement types available from car accessory shops). Bulb is surrounded by a square section hood which may be adjusted to control beam area. Fixing box: 53 x 32mm with luminous push on-off switch. Overall length: 556mm. Gooseneck is finished in chrome with plastic attachments. Supplied with red and black connecting leads.

Order

WF22Y (Gooseneck Lamp) £7.95

Alarm Beacon



A very high efficiency, low power consumption beacon, designed for use with intruder alarms. The xenon tube gives an intense flash of light once every second. The cover has a flat top marked with Fresnel rings and striated lines for maximum light dispersion. The whole unit is completely sealed and fully weatherproof.

Working voltage: 12V DC
Supply current: 40mA
Flash rate: 1 flash per second
Overall size: 74mm diameter x 52mm high
Fixing: Two 5mm holes on 45mm centres.
Maximum panel thickness: 10mm

Supplied with 70mm diameter foam mounting washer and approx. 0.5m red and black cable.

Order

YK39N (Alarm Beacon) £14.95

LIGHT EMITTING DIODES

3mm Diameter Types



A good quality, bright, miniature LED available in four colours. Case size: 3mm dia. A panel mounting clip is available, sold separately. Cathode denoted by flat on body and by short lead.

	Red	Green	Orange	Yellow
Light output typical at $I_f = 20\text{mA}$	2mcd*	3.5mcd	5mcd	4mcd
Forward voltage at $I_f = 20\text{mA}$	2V*	2.2V	2V	2.1V
Forward current (max)	20mA	30mA	30mA	30mA
Reverse voltage (max)	5V	5V	5V	5V
Power dissipation (max)	120mW	105mW	105mW	105mW
Peak wavelength	695nm	565nm	635nm	585nm

* Ratings shown at $I_f = 10\text{mA}$.

The LED has a diffused lens which gives a wide viewing angle.

Order

WL32K (Mini LED Red)	11p
WL33L (Mini LED Green)	16p
WL34M (Mini LED Orange)	16p
YY38R (Mini LED Yellow)	16p

Mini LED Clip

Panel mounting clip to suit Mini LED's. Panel cut-out 5mm dia. Bezel diameter 6.5mm.



Order

YY39N (Mini LED Clip)	4p
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5mm Diameter Types



A good quality, bright standard LED available in four colours. Case size: 5mm dia. A panel mounting clip is sold separately. Cathode denoted by flat on body and by short lead.

	Red	Green	Orange	Yellow
Light output typical at $I_f = 20\text{mA}$	2mcd*	3.5mcd	5mcd	4mcd
Forward voltage at $I_f = 20\text{mA}$	2V*	2.2V	2V	2.1V
Forward current (max)	20mA	30mA	30mA	30mA
Reverse voltage (max)	5V	5V	5V	5V
Power dissipation (max)	120mW	105mW	105mW	105mW
Peak wavelength	695nm	565nm	635nm	585nm

* Ratings shown at $I_f = 10\text{mA}$.

The LED has a diffused lens which gives a wide viewing angle.

Order

WL27E (LED Red)	11p
WL28F (LED Green)	16p
WL29G (LED Orange)	16p
WL30H (LED Yellow)	16p

LED Clip

Panel mounting clip to suit standard LED's. Panel cut-out 6.75mm dia. Bezel diameter 8mm.



Order

YY40T (LED Clip)	4p
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High Brightness Types



A high brightness red LED available in miniature and standard sizes. The LED's fit the appropriate clips listed above. The cathode is denoted by the flat on the body and by the short lead.

	Min	Std
Case size (dia.)	3mm	5mm
Light output typical at $I_f = 20\text{mA}$	7mcd	7mcd
Forward voltage at $I_f = 20\text{mA}$	2V	2V
Forward current (max)	30mA	30mA
Reverse voltage (max)	5V	5V
Power dissipation (max)	105mW	105mW
Peak wavelength	635nm	635nm

The LED has a diffused lens which gives a wide viewing angle.

Order

WL83E (Hibri LED Red Min)	30p
WL84F (Hibri LED Red Std)	30p

Ultra-Bright Types



Ultra bright red LED's available in 5mm standard sizes. The LED's fit the 5mm clip listed above. The cathode is denoted by the flat on the body or by the short lead. Both types have a narrow angle, but QY85G is extremely narrow for pin-point brightness.

Case size (dia.)	5mm
Light output typical at $I_f = 20\text{mA}$	80mcd
Forward voltage at $I_f = 20\text{mA}$	1.8V
Forward current (max)	30mA
Reverse voltage (max)	4V
Power dissipation (max)	100mW
Peak wavelength	660nm

Order

QY84F (Ultrabri LED Red Std)	60p
QY85G (Ultrabri LED Red Nar)	60p

LED Covers



Attractive coloured covers for LED's which also serve to clip the LED on the front panel. Suitable for use with 5mm dia (0.2in.) LED's the covers increase the viewing angle up to 180° and give a finished appearance. The cover has a flat top marked with Fresnel rings and striated lines for maximum light dispersion. The covers simply clip into a 6.35mm (1/4in) panel cut-out and the LED then clips in from the rear. Suits panels 1.6mm to 3.2mm thick. Overall diameter: 7mm. Overall length: 11mm. Available in five colours: Amber, Clear, Green, Red and Yellow.

Order

YH53H (Cliplite Amber)	24p
YH54J (Cliplite Clear)	24p
YH55K (Cliplite Green)	24p
YH56L (Cliplite Red)	24p
YH57M (Cliplite Yellow)	20p

LED Chrome Bezel



A smart, panel mounting chrome bezel for standard 5mm (0.2in) size round LED's. The bezel requires a single hole 6.5mm (1/4in) diameter, and is secured by a nut and lock-washer. The bezel has a removable PVC grommet at rear which has two holes to take the twin leads of the LED. The grommet is then pushed down onto the base of the LED before soldering, and the assembly pressed into the body of the bezel until the flange of the LED is hard against the internal step with the grommet flush. The bezel is 10mm diameter and 5mm deep. Total length 15.5mm.

Order

FM38R (Chrome LED Holder)	24p
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Panel Mounting LED's



A very attractive panel-mounting LED available in a large or small chromed bezel or a black bezel. All three types are available with red or green LED's. Forward voltage 2V at 20mA.

Dimensions	Small chrome	Large chrome	Black
Panel fixing hole	5mm	5mm	8mm
Bezel dia. front	5mm	8mm	9mm
rear	6mm	10mm	10
Bezel length	3mm	5mm	5mm
Overall length	18mm	24mm	25mm
Lead length	6mm	6mm	9mm
Cathode denoted by	Thicker wire	Short lead	Short lead

Order

YY59P (Chrome LED Small)	78p
QY46A (Chrome LED Small Gn)	78p
YY60Q (Chrome LED Large Red)	85p
QY47B (Chrome LED Large Gn)	85p
QY48C (Black Bezel LED Red)	60p
QY49D (Black Bezel LED Gn)	60p

PCB Mounting LED's



PCB mounting LED's with diffused coloured lenses giving a very wide viewing angle. All types are high brightness. The LED's are mounted in a black plastic housing and viewed from the front the cathode is the right-hand lead.

	Red	Green	Orange	Yellow
Light output typical at $I_f = 20\text{mA}$	5mcd	3.5mcd	5mcd	5mcd
Forward voltage at $I_f = 20\text{mA}$	2V	2.2V	2V	2.1V
Forward current (max)	30mA	30mA	30mA	30mA
Reverse voltage (max)	5V	5V	5V	5V
Power dissipation (max)	105mW	105mW	105mW	105mW
Peak wavelength	635nm	565nm	635nm	585nm

Dimensions:
 Front face: 6 x 6mm
 Housing depth: 9mm
 The LED protrudes by 3.2mm
 Lead spacing: 2.5mm
 Lead length: 3.5mm

Order

QY86T (PCB LED Red)	28p
QY87U (PCB LED Green)	28p
QY88V (PCB LED Yellow)	28p
QY89W (PCB LED Orange)	28p

Rectangular Types

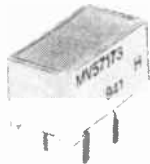


A rectangular shaped LED that gives a bright, evenly lit, solid bar of colour over the area 5.6 x 3.2mm. The lamps may be easily stacked to form bargraph meters. Overall dimensions: 6.4 x 3.8 x 6.7mm deep. Available in Red, Green and Yellow. A panel mounting clip to suit these LED's is available. Panel cut-out 8 x 6mm ($\frac{5}{8}$ x $\frac{3}{4}$ in.). Bezel: 9.4 x 6.9mm. The cathode is the left hand lead when the package is placed with the indented circle in the package facing you. Forward voltage at $I_F = 20\text{mA}$ is 2V. Light output at $I_F = 20\text{mA}$ is 4mcd for Red and Yellow and 3mcd for Green.

Order

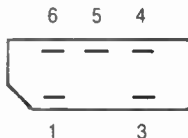
QW96E (Square LED Red)	44p
YH60Q (Square LED Green)	45p
YH61R (Square LED Yellow)	45p
YH62S (Square LED Clip)	6p

Half Inch Rectangular Lamp



A large rectangular lamp containing two LED chips having separate anodes and cathodes for each LED. The lamp gives a bright, evenly lit, solid slab of colour over the area 12.7 x 6.35mm ($\frac{1}{2}$ x $\frac{1}{4}$ in.). Overall dimensions: 14 x 7.5 x 8mm deep. Pin length: 5mm. Pin spacing: 0.1 x 0.2in. Available only in red. A panel mounting clip to suit this lamp is available. Panel cut-out: 16 x 9.5mm ($\frac{5}{8}$ x $\frac{3}{4}$ in.). Bezel: 17.5 x 11mm.

Pin 1	Cathode 1
Pin 3	Anode 2
Pin 4	Cathode 2
Pin 5	Not used
Pin 6	Anode 1



View from above

Forward voltage at $I_F = 20\text{mA}$ per chip: 2V Light output at $I_F = 20\text{mA}$ per chip (both chips on): 10mcd.

Order

YY41U (Large LED Red)	£1.30
YY42V (Large LED Clip)	20p

LED Shapes



A range of panel indicator LED's with flat tops moulded in various shapes: rectangular, square, cylindrical, triangular and arrowhead. The LED's are designed to press-fit into panels etc.

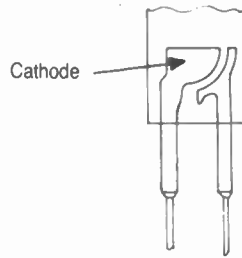
All shapes (typical ratings)

Colour	Light output at $I_F = 20\text{mA}$	Forward voltage at $I_F = 20\text{mA}$	Peak wavelength
Red	5mcd	2V	655nm
Green	3mcd	2.2V	565nm
Orange	6mcd	2V	635nm
Yellow	3mcd	2.1V	585nm

All colours:

Forward current (max):	30mA
Reverse voltage (max):	5V
Power dissipation (max):	105mW

The LED's have a diffused top to the lens which gives a wide viewing angle.



Shapes available:	Code	Size of top
Rectangular	R1	5x2.5mm
Square	S3	5x5mm
Cylindrical	C2	3mm diameter
Triangular (equilateral)	T4	5.6mm per side
Arrowhead (isosceles)	A5	5.1mm long sides, 2mm short side

Order

YY45Y (Shape LED R1 Red)	20p
YY46A (Shape LED R1 Green)	20p
YY47B (Shape LED R1 Orange)	20p
YY48C (Shape LED R1 Yellow)	20p
YY51F (Shape LED S3 Red)	20p
YY52G (Shape LED S3 Green)	20p
YY53H (Shape LED S3 Yellow)	20p
YH72P (Shape LED C2 Red)	20p
YH73Q (Shape LED C2 Green)	20p
YH74R (Shape LED C2 Yellow)	20p
YY54J (Shape LED T4 Red)	20p
YY55K (Shape LED T4 Green)	20p
YY56L (Shape LED T4 Yellow)	26p
YY57M (Shape LED A5 Red)	20p
YY58N (Shape LED A5 Green)	20p

Constant Current LED



A bright red LED encapsulated with a current regulating IC that provides for a constant intensity over a wide voltage range. No external limiting resistor is required within this range. The LED has a wide viewing angle.

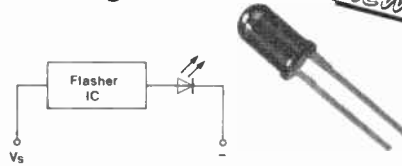
Case size: 5mm dia. (fits clip YY40T)
 Light output typical: 0.8mcd (5V to 15V)
 Supply voltage: 1.9V to 18V AC or DC
 Forward voltage: 13mA
 Reverse voltage (max): 18V
 Power dissipation (max): 300mW
 Peak wavelength: 660nm

The cathode is denoted by the flat on the body and by the short lead.

Order

RA00A (Constant Current LED)	98p
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Flashing LED



A red or green flashing LED in a standard 5mm package. The LED's fit the YY40T clip. Within the supply voltage range no series resistor is required. The cathode is denoted by the flat on the body.

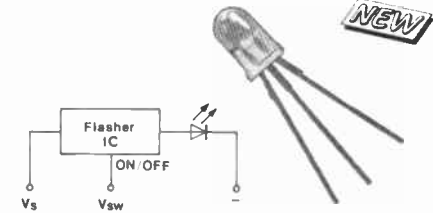
Voltage range: 4.75V to 7V
 Supply current: 12mA typical
 Light output typical at $V_S = 5\text{V}$: red 1.6mcd
 green 2mcd

Reverse voltage (max): 0.4V
 Power dissipation (max): 200mW
 Flash rate: 1.3 to 5.2Hz (3Hz typical)
 Peak wavelength: red 660nm
 green 560nm
 The LED has a wide viewing angle.

Order

QY96E (Flashing LED Red)	63p
QY97F (Flashing LED Green)	78p

Continuous/Flashing LED



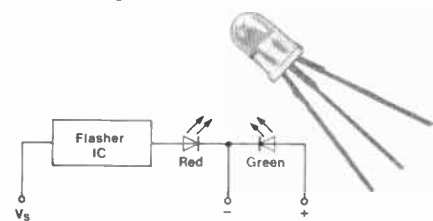
A red LED in a standard 5mm package which can be switched to flashing or continuous. The LED fits the YY40T clip. Within the supply voltage range no series resistor is required. By applying 5V to the lead denoted by the flat on the body, the LED may be made to stop flashing. Connect the LED supply voltage to the longest outer lead and negative to the centre lead.

Voltage range: 4.75V to 7V
 Supply current: 12mA typical
 Light output typical at $V_S = 5\text{V}$: 1.6mcd
 Reverse voltage (max): 0.4V
 Power dissipation (max): 200mW
 Flash rate: 1.3 to 5.2Hz (3Hz typical)
 Peak wavelength: 660nm
 Switch current @ $V_{SW} = 5\text{V}$: 25µA
 The LED has a wide viewing angle.

Order

QY98G (Switch Flashing LED Red)	78p
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Continuous Green/Flashing Red LED



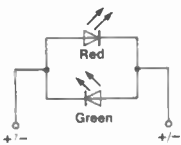
A red flashing and green continuous LED in a single 5mm package. The LED fits the YY40T clip. Within the supply voltage range the red LED requires no series resistor. The green LED does require a series resistor. The LED's have a common cathode (centre lead). The green anode is denoted by the flat on the body. The supply voltage for the flasher IC and red LED should be applied to the longest outer lead.

Supply voltage (red): 4.75V to 7V
 Forward voltage (green) at $I_F = 20\text{mA}$: 2.4V
 Supply current (red): 12mA
 Forward current (green): 30mA max
 Light output typical at $V_S = 5\text{V}$ (red): 6mcd
 at $I_F = 20\text{mA}$ (green): 6mcd
 Reverse voltage (red): 0.4V max
 (green): 5V max
 Power dissipation (total): 200mW
 Flash rate (red): 1.3 to 5.2Hz (3Hz typical)
 Peak wavelength (red): 630nm
 (green): 560nm
 The LED has a wide viewing angle.

Order

QY99H (Fish Red/Cont GrnLED)	£1.25
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MULTICOLOUR LED's Bi-Colour LED



NEW

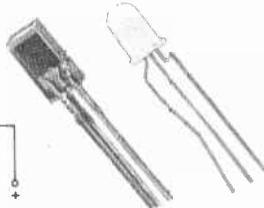
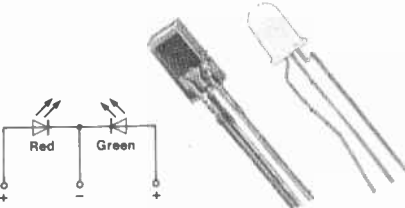
A two-lead 5mm LED with a red and green die connected in inverse parallel. The LED fits the YY40T clip. Only one series resistor is required. connect the positive to the short lead and the negative to the long lead for green and vice versa for red.

	Red	Green
Light output typical at $I_F = 20\text{mA}$	3mcd	3mcd
Forward voltage at $I_F = 20\text{mA}$	2V	2.2V
Forward current (max)	30mA	30mA
Reverse voltage (max)	5V	5V
Power dissipation (max)	105mW	105mW
Peak wavelength	635nm	565nm

Order

QY83E (Bi-colour LED) 85p

Tri-Colour LED's



A single LED with three leads that can be made to emit light of any colour of the spectrum from green through to red. The LED is encapsulated in a white diffused package, and available in a standard 5mm diameter round package, or rectangular 5 x 2.5mm package. Both types common cathode. Cathode denoted by longest lead, central lead. Red anode denoted by medium length lead, lead with double right-angle bend. Green anode denoted by shortest lead, lead with sloping angle bend.

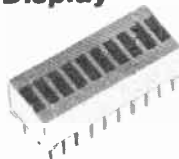
The diffused lens gives a wide viewing angle

Colour	Red	Green
Light output typical at $I_F = 20\text{mA}$	3mcd	3mcd
Forward voltage at $I_F = 20\text{mA}$	2V	2.2V
Forward current (max)	30mA	30mA
Reverse voltage (max)	5V	5V
Power dissipation (max)	120mW	105mW
Peak wavelength	695nm	565nm

Order

YH75S (Rd Multicolour LED) 28p
QR54J (Rect Multicolour LED) 28p

BARGRAPH ARRAYS 10 Segment Display



A 10-segment LED ladder encapsulated in a 20-pin DIL package. Designed for use as solid state level indicators, each LED is completely separate from the others in the package. The LED's may be driven from the LM3914, LM3915 or LM3916 bargraph driver IC's. The displays are available in red or green and may be stacked end to end.

Package size:	25 x 10 x 8mm high excluding pins.
Pin length:	6mm
Pin spacing:	0.3in x 0.1in (standard 20-pin DIL IC spacing).

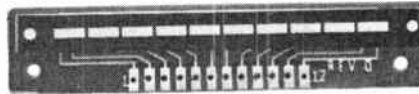
	Red	Green
Max forward current per segment	30mA	30mA
per package	200mA	160mA
Light output at $I_F = 20\text{mA}$	4.0mcd	3.0mcd
Forward voltage at $I_F = 20\text{mA}$	2.0V	2.2V
Peak inverse voltage	5V	5V

The anodes are denoted by product code marks printed on that side of the package.

Order

BY65V (Red Bargraph Dslpy) £3.15
YG33L (Green Bargraph Dslpy) £3.15

10-Segment LED Bar Array



An attractively finished 10-segment bar red display which is suitable for either front or rear panel mounting. The LED's are bright and evenly illuminated. The display is common anode connected to pins 1 and 12 and the board has a gold plated edge connector with 0.1in. centres.

Light output typical at $I_F = 10\text{mA}$	2mcd
Forward voltage at $I_F = 10\text{mA}$	2V
Forward current (max)	30mA
Reverse voltage (max)	5V
Power dissipation (max)	120mW
Peak wavelength	695nm

Dimensions

Overall size:	68 x 14 x 6.65mm deep
Bezel size:	66 x 6 x 2mm deep
Fixing holes in pcb:	60mm centres x 2.4mm dia.
Fixing holes in bezel:	62.4mm centres x 1.6mm dia
LED size:	5.1 x 1.6mm

Order

YH76H (Red 10-Seg Bargraph) £1.95

Multi-LED Arrays



A unique range of 2-way and 3-way end-stackable LED arrays available in red, green and yellow, enabling multiple arrays of any number of segments with the same or various colours to be assembled. The housings are black and designed to push fit into a panel cut-out 4.76mm (3/16in.) high and 7mm per LED long. The LED elements are diffused to give a wide viewing angle. Cathode denoted by short lead.

	Red	Green	Yellow
Light output typical at $I_F = 20\text{mA}$	1.2mcd	1.1mcd	1.5mcd
Forward voltage at $I_F = 20\text{mA}$	2V	2.2V	2.1V
Forward current (max)	30mA	30mA	30mA
Reverse voltage (max)	5V	5V	5V
Power dissipation (max)	120mW	105mW	105mW
Peak wavelength	695nm	565nm	585nm

Dimensions (mm)

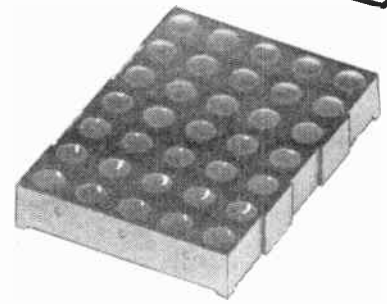
Type	2 segment	3 segment
Overall size (excl. leads)	14 x 6.13 x 8.6	21 x 6.13 x 8.6
Panel cut-out	14 x 4.76	21 x 4.76
LED window size	5.4 x 1.95	5.4 x 1.95

Order

YH77J (Dual LED Array Red) 38p
YH78K (Tri LED Array Red) 54p
YH79L (Dual LED Array Green) 38p
YH80B (Tri LED Array Green) 54p
YH81C (Dual LED Array Yellow) 44p
YH82D (Tri LED Array Yellow) 58p

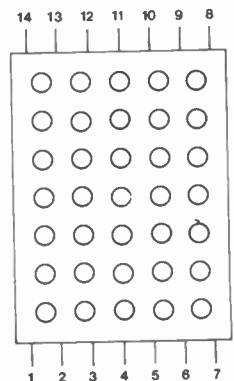
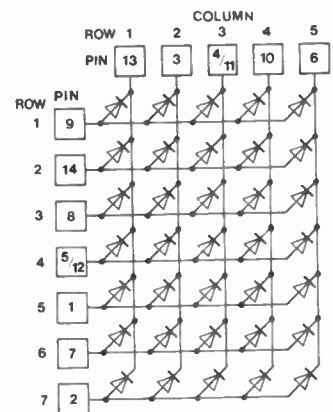
Dot Matrix Display

NEW



A 5 by 7 red dot matrix array on which the complete ASCII character set could be displayed. The package has slots and tongues in the sides so that rows of displays for moving messages etc., may be precisely aligned. The display has 35 diffused round 5mm circles flat with a grey plastic surround.

The matrix is shown in the drawing; the cathodes are connected to the column pins. Pins 4/11 and 5/12 are commoned. For example, to light the centre LED connect pin 5 or 12 through a series resistor to +V and pin 4 to 11 to negative. The display has a wide viewing angle and high, even brightness. With the display vertical, pin 1 is at the lower left looking from the front. This is still true even if display is rotated through 180° top to bottom.



Light output typical at $I_F = 20\text{mA}$: 1.5mcd
Forward voltage at $I_F = 20\text{mA}$: 2V
Forward current (max): 30mA
Forward current peak: 150mA at 10% duty cycle (100Hz to 1kHz)

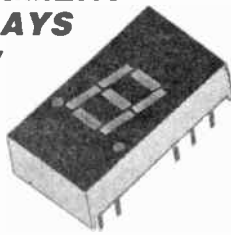
Reverse voltage (max): 5V
Power dissipation (max): 100mW
Peak wavelength: 635nm

Order

FT61R (5 x 7 LED Array) £3.95

SEVEN-SEGMENT LED DISPLAYS

0.3in Display



High brightness 0.3in LED display featuring highly legible, bold, solid segments, fast switching, low power consumption, and compatibility with integrated circuits.

Available in three types in Red only.

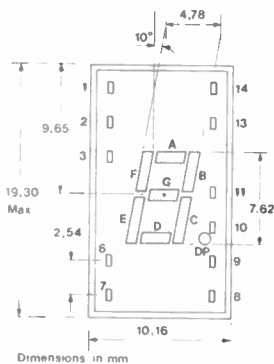
Type 1: common anode, Right-hand decimal point.
Type 4: Common cathode, Right-hand decimal point.

Luminous intensity: 1.3mcd at $I_F = 20\text{mA}$ (per segment).
Forward voltage: 2V at $I_F = 20\text{mA}$ (per segment)

A low current version of the Type 4 (common cathode) display is also available.

Luminous intensity: $800\mu\text{cd}$ at $I_F = 5\text{mA}$ (per segment).
Forward voltage: 1.7V at $I_F = 5\text{mA}$ (per segment).

Pins will fit a standard 14-pin DIL IC socket.



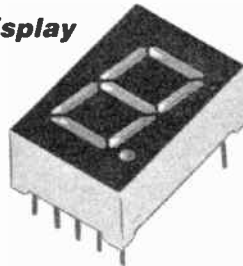
Pin No.	Type 1	Type 4
1	Cathode A	Anode F
2	Cathode F	Anode G
3	Anode*	No pin
4	No pin	Cathode*
5	No pin	No pin
6	NC	Anode E
7	Cathode E	Anode D
8	Cathode D	Anode C
9	Cathode DP	Anode DP
10	Cathode C	No pin
11	Cathode G	No pin
12	No pin	Cathode*
13	Cathode B	Anode B
14	Anode*	Anode A

*Signifies that the connection designated is internally connected to all other connections so noted.

Order

FR36P	(7-Seg Red Type 1)	£1.35
FR38R	(7-Seg Red Type 4)	£1.35
QY54J	(Low Current Disp)	£3.95

0.5in Display

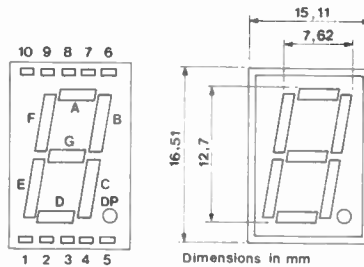


STAR BUY

High brightness 0.5in display featuring highly legible, bold, solid segments, fast switching, low power consumption, and compatibility with integrated circuits.

Available in two types in Red only.

Type 1: Common anode, Right-hand decimal point.
Type 4: Common cathode: Right-hand decimal point.



Characteristics:

Luminous intensity: 1.3mcd at $I_F = 20\text{mA}$ (per segment).
Forward voltage: 2V at $I_F = 20\text{mA}$ (per segment)

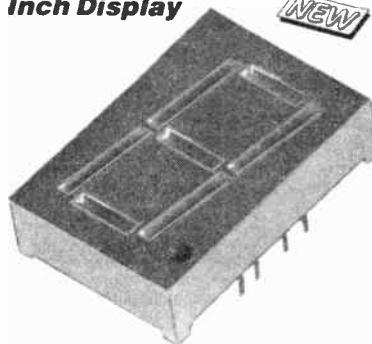
Electrical Connections

Pin No.	Type 1	Type 4
1	Segment E	Segment E
2	Segment D	Segment D
3	Common Anode	Common Cathode
4	Segment C	Segment C
5	DP	DP
6	Segment B	Segment B
7	Segment A	Segment A
8	Common Anode	Common Cathode
9	Segment F	Segment F
10	Segment G	Segment G

Order

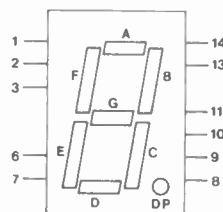
FR39N	(1/2" Display Type 1)	£1.60
FR41U	(1/2" Display Type 4)	£1.60

One Inch Display

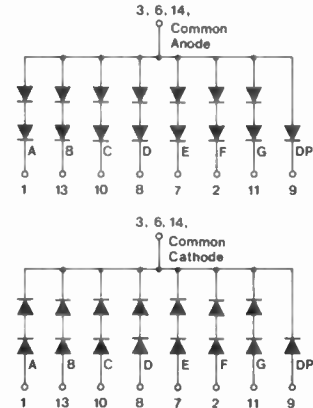


NEW

A very large display with an overall character height of 26mm (1in.). Available with common anode or common cathode in red.



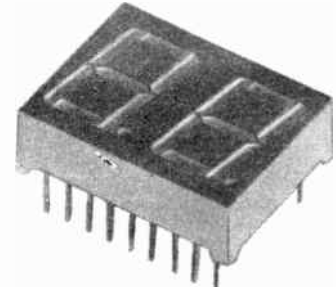
Light output typical at $I_F = 20\text{mA}$: 1.3mA
Forward voltage: 2V
Max forward current: 30mA
Overall dimensions: 32.9 x 22.4 x 8.5mm
Pin length: 6mm
Pin spacing: 0.6 x 0.1in (14-pin)



Order

FA03D	(1" Display Com Anode)	£2.95
FA04E	(1" Display Com Cathode)	£2.95

Double Digit Display



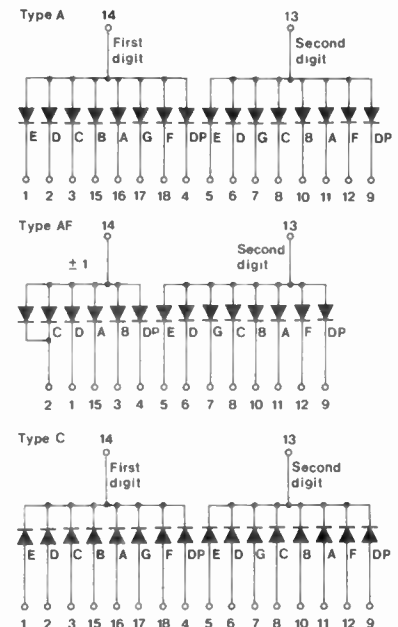
A 2-digit display available in red or green. Digits are 0.56in high with high contrast and wide viewing angles. All types have a right-hand decimal point.

Ratings per segment:

Luminous intensity: 1.3mcd at $I_F = 20\text{mA}$
Forward voltage: 2V at $I_F = 20\text{mA}$
Max forward current: 30mA

Type 'A': 2-digit (8.8.) Common anode. Type 'AF': 1½-digit (±1.8) Common anode. Type 'C': 2-digit (8.8.) Common cathode. Overall dimensions: 25 x 19 x 8mm. Pin spacing: 0.6 x 0.1in (18-pin).

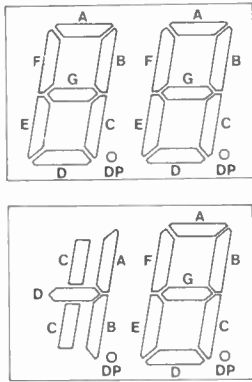
These displays may be used with direct drive or multiplexing type drivers.



PHONE NOW
0702 552911



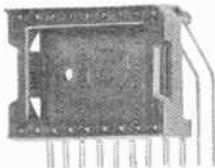
Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.



Order

BY66W (DD Display Type A)	£2.95
FA01B (DD Display Typ A Grn)	£3.20
BY67X (DD Display Type AF)	£2.60
BY68Y (DD Display Type C)	£2.95
FA02C (DD Display Typ C Grn)	£3.20

Vertical Mounting Socket

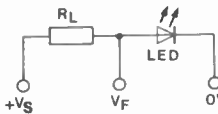


A vertical mounting socket for use with our DD displays. Sockets fix to pcb's on a 0.1 x 0.3in. matrix and hold the display at 90° from the pcb plane.

Order

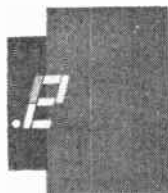
BK04E (Vertisocket Type 2)	£4.40
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Calculation of Series Resistors For LED's



Connect a resistor in series with the LED. The correct resistance value is given by the formula:
 $R_L = (V_S - V_F) \div I_F \Omega$
 where I_F is in amps, V_S is the applied voltage, V_F is the forward voltage shown in the tables above, and I_F is the forward current which gives the highest brightness at a safe dissipation and is approximately equal to 20mA (0.02A). For AC operation connect a diode 1N4148 etc. in inverse parallel with the LED and halve the value of the resistor determined by the above formula.

Display Filters



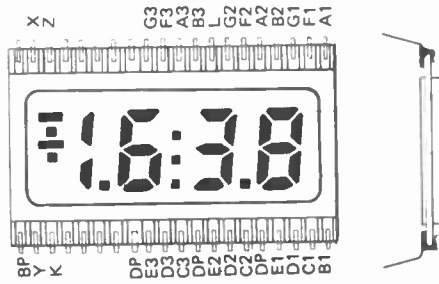
Anti-reflection filters for data displays which greatly improve the contrast.

Suitable for use with LED displays, incandescent filament displays, neon gas discharge displays and gas discharge displays. For optimum effectiveness use the filter whose colour is as close as possible to that of the display. Sold only in pieces 105 x 35 x 0.76mm in three colours. Suits up to eight 1/2in. displays or up to six 3/4in. displays, but may be cut with scissors to size required. Available in Green, Red and Yellow.

Order

FR33L (Filter Green)	£1.30
FR34M (Filter Red)	£1.30
FR35Q (Filter Yellow)	£1.30

LIQUID CRYSTAL DISPLAY



A 3 1/2 digit field effect liquid crystal display suitable for use in panel meters, digital multimeters and 12-hour clocks. With all segments on the current is typically 10µA at 5V rms and the display is thus ideal for battery operation. The digits are 12.7mm (1/2in.) high and give a solid black appearance on a silvered, reflective background. The display has a centre colon for use in clocks, and decimal points, plus and minus signs and overflow indicator for use in panel meters. The device is supplied in a 40-pin DIL package 33 x 2.54mm (1.3 x 0.1in) spacing suitable for use with our Soldercon pins. The device is only

guaranteed if it has not been soldered and the device will only be replaced for scratched front face if the protective coat has not been removed — (after checking that there is no damage the protective coat should be removed before use).

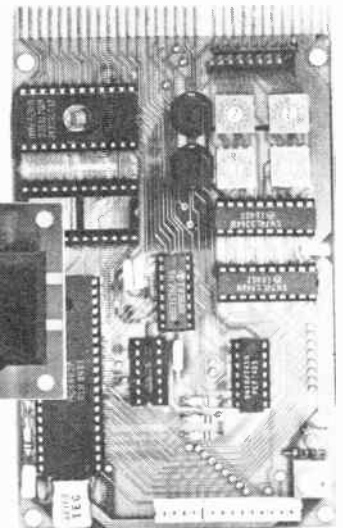
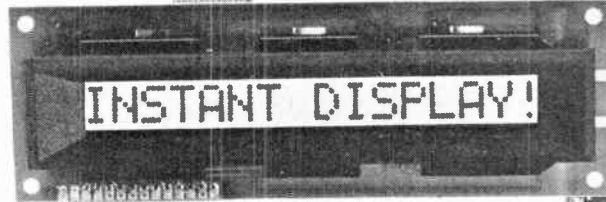
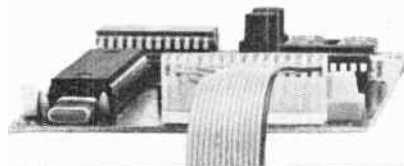
Specification (at 25°C and 5V rms)

	Min	Typical	Max
Operating voltage (V_{rms})	3	5	9
Allowable DC drive component (mV)			50
Operating frequency (Hz)	30	32	100
Current all segments on (μA)		2.5	5
Capacitance all segments on (pF)		500	1000
DC resistance all segments on ($M\Omega$)	32	100	
Response time to 90% on (msec)		75	150
Decay time to 10% on (msec)		150	300
Contrast ratio		20:1	
Operating temperature range (°C)	-15	25	55
Viewing angle at 4V rms		±45°	
5V rms		±60°	
6V rms		±75°	
Expected life (hours)			50,000
Overall dimensions: 51 x 30.5 x 3.5mm			
Pin length: 6.4mm			

Order

FY89W (Lqd Crystal Display)	£5.50
------------------------------------	-------

MESSAGE DISPLAY SYSTEM



A 16-character liquid crystal 5x7 dot-matrix display and microprocessor driven controller supplied complete, ready to connect up and be fully operational in minutes. A good quality 5V 250mA power supply is required. A set of 16 pre-programmed messages are instantly available from on-board ROM, each being displayed by simply connecting the appropriate input to ground via a mechanical or electronic switch or logic output. By using the on-board hexadecimal switches, users may write their own messages up to four 16-character lines, which may be stored in the 128 bytes of RAM in the 6802. A spare socket is provided into which a 6116 (not supplied) may be plugged to provide additional memory. Further expansion is possible thanks to all relevant signal lines being brought out to a 32-way 0.1in. double-sided edge connection. 190 standard characters are available

for display, but users may program their own characters within the 5x7 display format if required. The message may be flashed, scrolled etc.

The module is supplied as two boards, interconnection cable, display bezel and mounting hardware.

Size of control board: 138 x 84 x 20mm deep.
 display board: 80 x 37 x 21mm deep.

Interconnection cable: 108mm long.

Bezel size: 86 x 25mm.

Panel cut-out: 82 x 21mm.

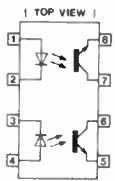
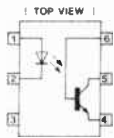
Order

YJ49D (Message Display System)	£69.95
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**FAST SERVICE
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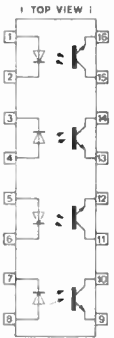


OPTO-ISOLATORS Opto Transistor Isolator



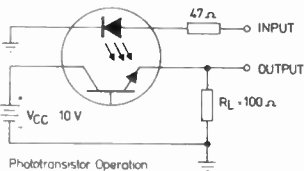
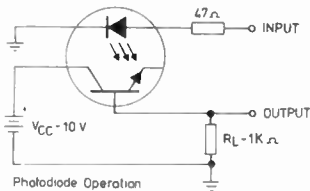
PIN NO.	FUNCTION
1	ANODE
2	CATHODE
3	NC
4	EMITTER
5	COLLECTOR
6	BASE

PIN NO.	FUNCTION
1	ANODE
2	CATHODE
3	CATHODE
4	ANODE
5	EMITTER
6	COLLECTOR
7	COLLECTOR
8	EMITTER



PIN NO.	FUNCTION
1	ANODE
2	CATHODE
3	CATHODE
4	ANODE
5	ANODE
6	CATHODE
7	CATHODE
8	ANODE
9	EMITTER
10	COLLECTOR
11	COLLECTOR
12	EMITTER
13	EMITTER
14	COLLECTOR
15	COLLECTOR
16	EMITTER

Optically coupled infra-red emitting diodes and phototransistors in dual-in-line packages. Single type is in a 6-pin DIL package, dual type is in an 8-pin DIL package and quad type is in a 16-pin DIL package. On the single type, a base lead is provided so that the device may be biased in the conventional manner.



Absolute maximum ratings

Input to output voltage:	1500V
Collector-base voltage (V_{CBO}):	70V
Collector-emitter voltage (V_{CEO}):	30V (dual and quad 20V)
Emitter-base voltage (V_{EBO}):	7V
Input diode reverse voltage:	3V
Input diode continuous forward current:	100mA
Continuous power dissipation:	LED: 150mW Phototransistor: 150mW Total: 250mW (quad 450mW)

Electrical characteristics (typical)

Input diode static reverse current (at $V_R = 3V$):	<10 μ A
On state collector current ($V_{CE} = 0.4V, I_F = 16mA$):	Phototransistor operation ($I_B = 0$): 7mA Photodiode operation ($I_E = 0$): 20 μ A
Off-state collector current ($V_{CE} = 10V, I_F = 0$):	Phototransistor operation ($I_B = 0$): 1nA Photodiode operation ($I_E = 0$): 0.1nA
h_{FE} ($V_{CE} = 5V, I_C = 10mA, I_F = 0$):	300

Input diode forward voltage at $I_F = 16mA$: 1.2V
 Collector-emitter saturation voltage ($I_C = 2mA, I_F = 16mA, I_B = 0$): 0.25V
 Input to output resistance (diode leads shorted to transistor leads shorted at V_{in} to $V_{out} = 1.5kV$): $10^{11}\Omega$
 Input to output capacitance: 1pF
 Max operating frequency: >125kHz
 Phototransistor operation: >250kHz
 Photodiode operation: 13%

Order

WL35Q (Opto-Isolator)	80p
YY62S (Dual Opto-Isolator)	£1.65
YY63T (Quad Opto-Isolator)	£3.15

High Sensitivity, High Voltage Opto Transistor Isolator

This opto-isolator is similar to WL35Q above, except that it has a min transfer ratio of 100% and a 7500V peak isolation voltage (5300V rms). Pin-out is the same as WL35Q.

Absolute maximum ratings:

Input to output voltage:	7500V peak, 5300V RMS
Collector-base voltage (V_{CBO}):	70V
Collector-emitter voltage (V_{CEO}):	70V
Emitter-base voltage (V_{EBO}):	7V
Input diode reverse voltage:	3V
Input diode continuous forward current:	90mA
Continuous power dissipation:	LED: 135mW Phototransistor: 200mW Total: 260mW

Electrical characteristics (typical)
 h_{FE} ($V_{CE} = 5V, I_C = 100\mu A$): 500
 Input diode forward voltage at $I_F = 10mA$: 1.2V
 Input to output capacitance: 0.5pF
 Max operating frequency: >100kHz
 Min transfer ratio: 100% at $I_F = 10mA$

Order

RA57M (Hi-Sensitivity Opto)	98p
-----------------------------	-----

Opto Darlington Isolator

An optically coupled gallium arsenide infra-red emitting LED and NPN silicon photo-darlington transistor in a 6-pin DIL package. A base lead is provided so that the device may be biased in the conventional manner if desired. Pin-out is the same as WL35Q.

Absolute maximum ratings:

Input to output voltage:	1500V
Collector-base voltage (V_{CBO}):	30V
Collector-emitter voltage (V_{CEO}):	30V
Emitter-base voltage (V_{EBO}):	7V
Input diode reverse voltage:	3V
Input diode continuous forward current:	100mA
Continuous power dissipation:	LED: 150mW Photodarlington: 150mW Total: 250mW

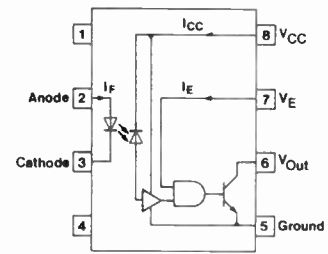
Electrical characteristics (typical)
 On-state collector current ($V_{CE} = 1V, I_F = 10mA$): 100mA
 Off-state collector current ($V_{CE} = 10V, I_F = 0$): 100nA
 h_{FE} ($V_{CE} = 5V, I_C = 10mA, I_F = 0$): 15,000
 Input diode forward voltage (V_F): 1.5V
 Collector-emitter saturation voltage ($I_C = 125mA, I_F = 50mA, I_B = 0$): 1V
 Input to output resistance (diode leads shorted to transistor leads shorted at V_{in} to $V_{out} = 1.5kV$): $10^{11}\Omega$
 Input to output capacitance: 1pF
 Max operating frequency: >10kHz
 Min transfer ratio: 300%

Order

WQ70M (Darlington Isolator)	£1.50
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High Speed Opto Isolator 6N137

NEW



An opto-isolator which combines a GaAsP LED as the emitter and an integrated high gain multi-stage high speed photodetector. The output of the detector circuit is an open-collector, Schottky clamped transistor capable of sinking 50mA. The enable input has normal TTL characteristics (25ns propagation delay) and when low, locks the output high. A ceramic 0.1 μ F capacitor must be connected between pins 5 and 8 as close to the IC as possible. Operation speeds up to 10Mbit/s are possible with input currents as low as 5mA. Ideal for digital interfaces, isolated line receivers, ground loop elimination, pulse transformer replacement etc.

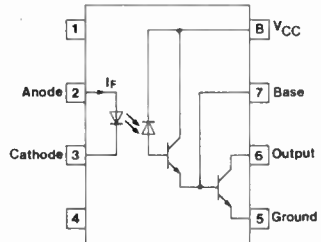
Supply voltage V_{CC} : 5V (7V max)
 LED input current: 6.3mA (15mA max)
 Output current (low level): 50mA max (high level): 10nA (250 μ A max)
 Supply current $I_F = 0mA$ (low level): 15mA (high level): 10mA
 LED forward voltage: 1.55V at $I_F = 10mA$
 LED reverse voltage: 5V max
 Isolation voltage: 3000V DC
 Current transfer ratio: 750% at $I_F = 5mA$
 Propagation delay: 48ns

Order

RA58N (Hi-Speed Opto 6N137)	£4.95
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High Gain Opto Isolator 6N139

NEW



A high sensitivity, high speed split-darlington opto isolator. Speeds up to 300kbit/s are possible.

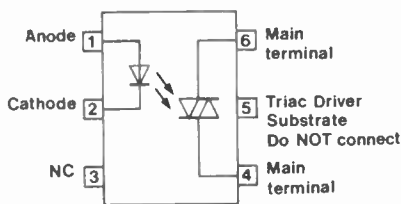
Supply voltage (V_{CC}): 5V (18V max)
 LED input current: 0.5mA (20mA max)
 Output current: 60mA max
 LED forward voltage at $I_F = 0.5mA$: 1.37V
 LED reverse voltage: 5V max
 Isolation voltage: 3000V DC
 Current transfer ratio: 800% at $I_F = 0.5mA$
 900% at $I_F = 1.6mA$ ($V_F = 1.42V$)

Order

RA59P (Hi-Gain Opto 6N139)	£2.75
----------------------------	-------

**CALL IN TO YOUR LOCAL
Maplin SHOP
in SOUTHAMPTON**
 46 Bevois Valley Road. ☎0703 225831

Opto Triac Isolator



An optically coupled gallium arsenide infra-red emitting LED and triac in a 6-pin DIL package. The triac has a 400V rating (suitable for 240V AC mains) and I_T rms of 100mA maximum.

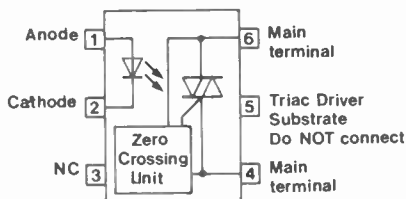
Characteristics

Forward voltage (V_F) at $I_F = 30mA$:	1.3V
Continuous forward current:	60mA max
LED current needed to latch output:	15mA
Holding current:	200µA
Reverse voltage:	3V max
PIV triac:	400V
I_T (rms) triac:	100mA
Isolation voltage:	7500V peak, 5300V rms

Order

QQ10L (Triac Isolator) £1.40

Opto Zero-Crossing Triac Isolator



An optically coupled gallium arsenide infra-red emitting LED and zero-voltage crossing triac in a 6-pin DIL package. The triac has a 400V rating (suitable for 240V AC mains) and I_T rms of 100mA maximum.

Forward voltage (V_F) at $I_F = 30mA$:	1.3V
LED current required to latch output:	7mA
Max forward current:	60mA
Reverse voltage (max):	6V
Isolation voltage:	7500V peak, 5300V RMS
PIV triac:	400V
I_T triac:	100mA

Order

RA56L (Optotriac + Zero Crs) £2.25

INFRA RED TRANSCEIVERS

Miniature Infra-Red Source

A gallium arsenide infra-red LED spectrally matched to YY66W described below. When used as a pair with YY66W they may be separated up to about 30mm. Similar to TIL32.

Characteristics

V_F at $I_F = 20mA$:	1.2V
I_F max:	30mA
Light output at $I_F = 20mA$:	1.5mW
Peak wavelength:	940nm
Reverse voltage (V_R):	3V
Rise time:	300ns
Fall time:	200ns



Cathode denoted by flat on package.

Order

YY65V (Infra-Red Source) 58p

Low Cost Phototransistor

A low-cost, high quality NPN silicon phototransistor, having high illumination sensitivity, fast response time, and low dark current. This transistor is spectrally matched with our Infra-Red Source described above. Package is TIL78. The collector is denoted by a flat on the package and the shorter of the two leads; there is no access to the base terminal.



Absolute maximum ratings

V_{CE0} :	50V
V_{ECO} :	7V
P_{TOT} :	50mW

Electrical characteristics

Light current at 940nm ($V_{CE} = 5V, H = 20mW/cm^2$):	7.0mA
Dark current at $V_{CE} = 30V$:	<0.1nA
Peak spectral response:	940nm

Order

YY66W (Infra-Red Sensor) 62p

High Power Infra-Red Emitting Diode



A high power infra-red emitter in a standard 5mm (0.2in.) diameter package designed primarily for remote control. Cathode denoted by flat on package.

Radiant power output:	12mW at $I_F = 100mA$
Wavelength:	940nm
Forward voltage:	1.4V at $I_F = 100mA$ 2.55V at $I_F = 1A$, Pulse width = 10µs and duty cycle ≤ 1%
Capacitance:	25pF (f = 1MHz)

Order

YH70M (IR Emitter TIL38) 56p

Large Area Photodiode



A high speed PIN photodiode designed to operate in the reverse-bias mode. It provides low capacitance with high speed and high photosensitivity. The photodiode chip is moulded in a black infra-red transmissive plastic. It is designed for infra-red remote control. The package is 7.3 x 5.6 x 4mm; the cathode is denoted by the shorter lead and the sensitive surface is the large side farthest from the leads. The active chip area is about 8.83 square millimetres.

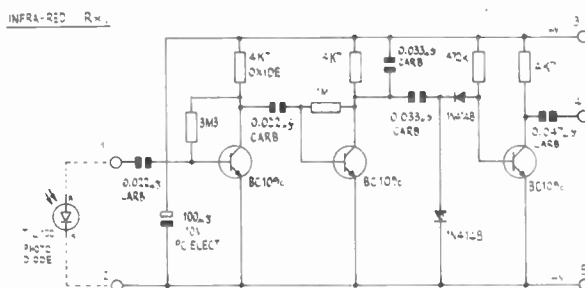
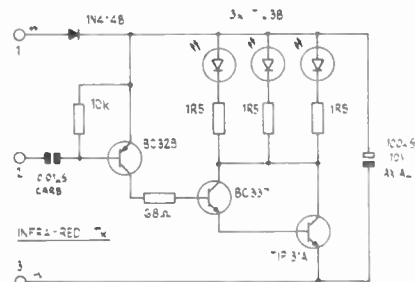
Breakdown voltage:	30V
Dark current:	5nA at $V_R = 10V$
Light current:	15µA at $V_R = 10V$ (Incident radiance 2.5µW/mm² at 940nm)
Capacitance:	30pF at $V_R = 3V$ (f = 1MHz)

Order

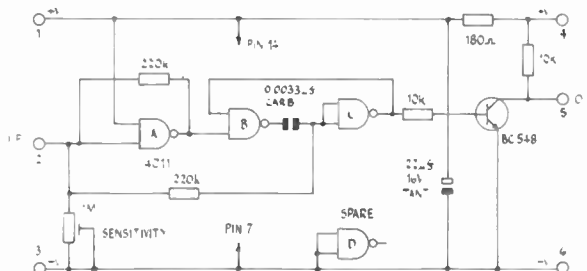
YH71N (Photodiode TIL100) 98p

Infra-Red Link

The transmitter and receiver circuits shown here are capable of a 40m (120ft) range, although at this distance, the pulse shaper circuit shown would be needed. The circuit is designed to accept a digital input, such as the circuits shown with the SL490 IC series in the Semiconductor Section. The circuits on their own are simply building blocks onto which other parts must be added before they will function. All three circuits operate on 9V and the transmitter can be run from a PP3 battery.



PULSE SHAPER



LIGHT RESPONSIVE DEVICES

Solar Cell MS4A



A silicon photo-voltaic cell size 5.26 x 6.35mm coated with a tough varnish to protect the junction structure. Output current: 3mA into 100Ω at 3000 lumens per sq. ft. Open circuit voltage at 3000 lumens per sq. ft. 500mV. Typical short circuit current at 3000 lumens per sq. ft. 5mA. Picture shows sensitive surface which is the negative.

Order

BL23A (Solar Cell MS4A) £2.98

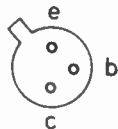
Phototransistor BPX25



A high sensitivity silicon planar NPN phototransistor for general purpose use. Top of package (TO 18) is lensed.

Absolute maximum ratings

V_{CB0} : 32V
 V_{CE0} : 32V
 V_{EB0} : 5V
 I_C : 100mA
 P_{TOT} : 300mW



Electrical characteristics

(open-circuit base, except for h_{FE} typical)
 Light current ($V_{CE} = 6V$ @ 1000 lux): 13mA
 Dark current ($V_{CE} = 24V$): 100nA
 h_{FE} ($V_{CE} = 6V, I_C = 2mA$): 500
 Peak spectral response: 800nm
 Cut-off frequency (Note 1): 200kHz

Note 1: Improved switching times can be obtained by connecting the base lead to give a quiescent bias current.

Order

QF30H (BPX25) £2.85

Phototransistor TIL81



A high sensitivity silicon planar NPN phototransistor for general purpose use. Top of package (TO 18) is lensed. Pin out is the same as the BPX25.



Absolute maximum ratings

V_{CB0} : 50V
 V_{CE0} : 30V
 V_{EB0} : 7V
 I_C : 50mA
 P_{TOT} : 250mW

Electrical characteristics

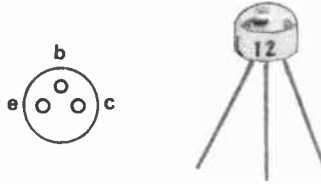
(open-circuit base, except for h_{FE} typical)
 Light current ($V_{CE} = 5V$): 22mA
 Dark current ($V_{CE} = 10V$): 20μA
 h_{FE} ($V_{CE} = 5V, I_C = 1mA$): 200
 Peak spectral response: 900nm
 Cut-off frequency (Note 1): 1MHz

Note 1: These switching times can be obtained by connecting the base lead to give a quiescent bias current.

Order

QY82D (Infrared Sensr TIL81) £1.20

Photo-Darlington Transistor MEL12



A very high sensitivity silicon planar NPN photo-darlington transistor featuring a very high light current and low dark current.

Absolute maximum ratings

V_{CB0} : 60V
 V_{CE0} : 40V
 V_{EB0} : 10V
 I_C : 150mA
 P_{TOT} : 200mW

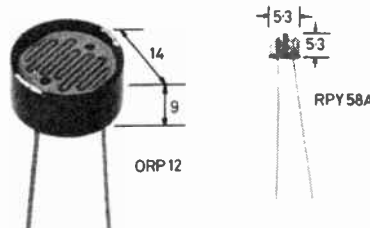
Electrical characteristics

(open-circuit base typical).
 Light current ($V_{CE} = 5V$ @ $H = 2mW/cm^2$): 3mA
 Dark current ($V_{CE} = 5V$): 100nA

Order

HQ61R (MEL 12) 98p

Photoconductive Cells



Two cadmium sulphide photoconductive cells sensitive to visible light. They have maximum sensitivity in the green, yellow, orange and red parts of the spectrum (wavelengths: 480-690nm). Resistances quoted below are those measured when the cell is illuminated by a lamp of colour temperature 2700°K. For other light sources the cell resistance should be multiplied by the following approximate factors.

Source of illumination	Multiplication Factor
------------------------	-----------------------

Incandescent radiation at colour temperature of: 1500°K	x0.5
2000°K (oil-fired burner-yellow flame)	x0.66
2854°K (international standard)	x1.05
Sunlight	x1.33
White fluorescent light	x2

Where cell is operated from a 50Hz AC source the resistance values are between 1 and 1.3 times those for DC.

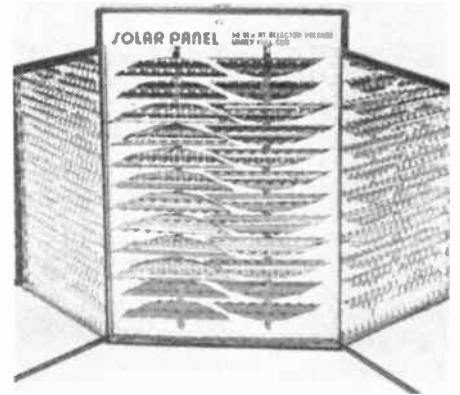
Type	Incidence of illumination	Cell resistance at 50 lux	Min. dark resistance
ORP12	End-on	2400Ω	10MΩ
RPY58A	Side-on	600Ω	200kΩ

Type	Min bright resistance	Max. power dissipation	Max. cell voltage
ORP12	20Ω*	200mW	110V
RPY58A	70Ω†	-	-
* At 10,000 lux.		† At 1000 lux.	

Order

HB10L (LDR ORP12) 97p
HB09K (LDR RPY58A) £1.35

Solar Panels



Each solar panel contains crescent shaped silicon solar cells connected so as to supply 9V or 12V at 50mA when the incident light is about 100mW/sq. cm. The cells are mounted in an attractive and sturdy black plastic case. The plastic faceplate comprises hundreds of bubble magnifiers which maximise cell performance as they enhance the light striking the solar cells. Two reflector panels fit either side of the case and increase cell efficiency even more.

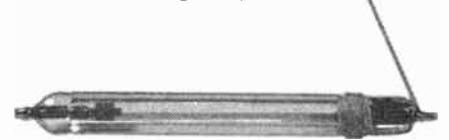
The cells are internally connected to a 3.5mm jack socket and a 3.5mm jack plug and approx 1m of twin flex is supplied with each panel.

Dimensions: Panel size 98 x 128mm.
 Case size 146 x 105 x 13mm.
 Reflector panel 127 x 100mm.

Order

RK23A (Solar Panel 9V) £12.95
RK24B (Solar Panel 12V) £14.95

XENON TUBE



A general purpose, high quality flash tube. Electrodes are connected at each end of the straight hardglass tube which seals in the gas.

Specification

Minimum anode voltage:	210V
Maximum anode voltage:	360V
Nominal anode voltage:	330V
Maximum energy input per flash:	0.86 Watt secs
Maximum flash rate at maximum input power:	200 flashes/sec
Minimum trigger voltage:	5kV
Approx. life:	36,000,000 flashes
Dimensions:	35 x 3.6mm dia.

Order

YQ62S (Xenon Tube) £1.98

Trigger Transformer For Xenon Tube



A trigger transformer designed for use with our xenon tube.

Primary volts (max.):	300V
Secondary volts:	4kV
Trigger capacitor:	0.033μF
Dimensions:	16 x 7mm. dia.

Order

YQ63T (Trigger Transfmr) 48p

FIBRE OPTIC LIGHT GUIDE



A rugged polymethyl methacrylate fibre with a polymer cladding and black protective sheath which may be bent and handled in the same way as insulated wires without damage. Ideal for use in equipment to provide several light sources possibly in confined spaces from a single lamp some distance away.

The fibre as supplied has a roughly cut end and this should be cleanly sliced off using a razor blade or a very sharp knife. Light transmission can be increased by typically 33% by polishing the ends of the fibre after cutting.

Overall diameter:	2.2mm (0.1in.)
Fibre diameter:	1mm (0.04in.)
Refractive index:	1.49
Nominal aperture:	0.53
Acceptance angle:	±32° max
Transmission attenuation:	1.2dB/m (20 - 25% per metre)
Spectral response (3dB):	385 to 880nm
Temperature range:	-40°C to +80°C
Flammability:	Supports combustion 75mm per minute
Bending:	Min radius 20mm
Chemical resistance:	Attacked by organic solvents

Sold in continuous lengths in multiples of 1/2 metre.
Max length in one piece 100m

Order

XR56L (1mm Light Guide)..... 35p

LENS

A 1in. focal length semi-precision glass lens. Size: 9.1mm dia.

Order

HQ63T (Lens)..... £3.50

LENSHOLDER



A black anodised aluminium lensholder, drilled to accept our 9mm lens in one end and photodarlington MEL12 in the other end.

Outside dia. 12.7mm.

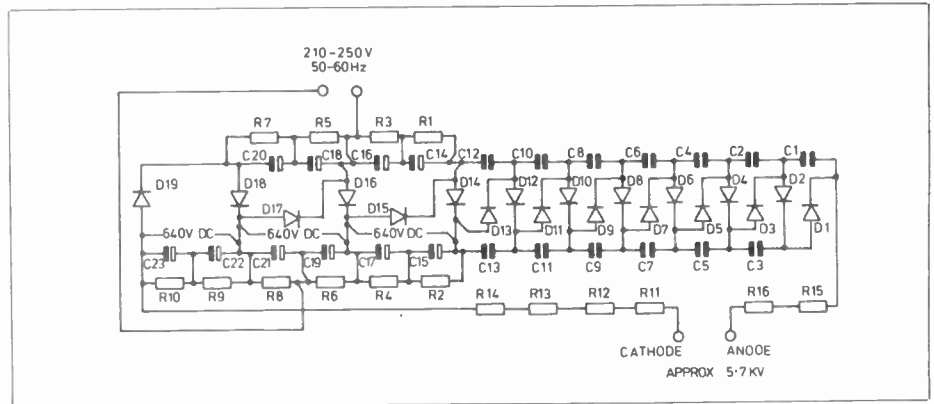
Order

HQ64U (Lensholder)..... £1.40

LASER TUBE

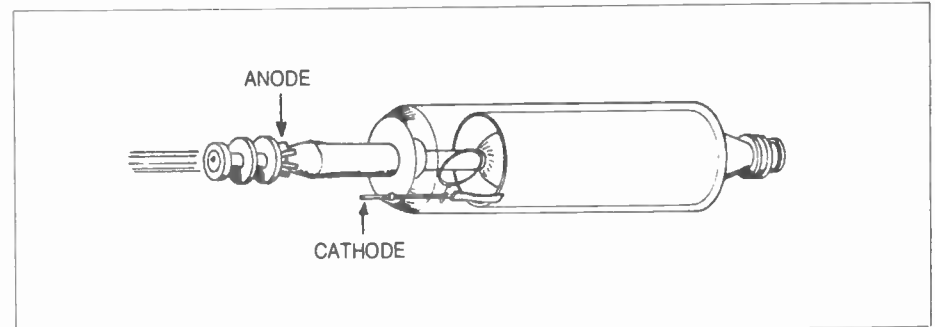
A helium-neon laser tube having a typical power of 0.5 to 0.9mW. A power supply to suit the tube is

shown below, and we can supply a pcb on which to make the circuit.



The laser is capable of making small holograms and is ideal for use in school physics laboratories as the laser can be used to demonstrate many of the properties of light. The laser emits randomly polarised red light at 632.8nm wavelength and at a power which makes it completely safe provided that

you do not stare directly into the beam, when retinal damage may result. Therefore never use in the presence of children unless a diverging lens is fitted to the beam. The laser is incapable of burning, cutting or drilling and may be directed at the skin when no harm whatsoever will result.



Specification:

Typical power:	0.5 to 0.9mW
Overall size:	240 x 32mm dia.
Beam exit diameter:	0.65mm
Full angle divergence:	1.2mRad max.
Starting voltage:	5.7kV peak DC
Supply voltage:	1300V to 1550V
Tube voltage drop:	800V ±50V
Ballast resistor:	100kΩ to 150kΩ
Operating current:	5mA
Wavelength:	632.8nm (red light at 4.7 x 10 ¹⁴ Hz)
Operating mode:	TEM ₀₀ (Gaussian intensity distribution)

Order

XL11M (Laser Tube)..... £129.95

The parts required for the power supply are as follows:

C1 to 13	1000V Disc 4700pF (13 off)
C14 to 23	Axial 10μF 450V (10 off)
R1 to 10	1W Res 1M (10 off)
R11 to 16	1W Res 33k (6 off)
D1 to 19	1N4007 (19 off)
1	5kV Laser PSU PCB
1m	EHT wire
1	TR 240V Isolation Transformer

5kV Laser PSU PCB

A fibre glass board. Size 200 x 102mm

Order

HY19V (5KV Laser PCB)..... £4.95

**BUSINESSES, SCHOOLS
GOVT. DEPT'S, IF YOU
NEED AN ACCOUNT...**

CONTACT MPS NOW!

**MAPLIN PROFESSIONAL SUPPLIES
P.O. BOX 777, RAYLEIGH, ESSEX SS6 8LR
TELEPHONE 0702 552911. TELEX 995695.**

ORGAN COMPONENTS

Contacts	211	Keyboards	210	Spring Lines	210
Footswells	214	Pedals	214	Stop Tabs	212

SOUND GENERATION SAM 77

The SAM 77 is a CMOS integrated circuit that provides 7-stages of division in one 14-pin DIL package. Twelve SAM 77's driven from one master oscillator e.g. the DMO2T will provide all the basic tone sources for an electronic organ having 8 octaves (97 notes). The input of the SAM 77 has a Schmitt trigger so that sine or square wave inputs may be used. The amplitude of the input signal must not exceed the voltage difference between pin 7 and pin 1. The input draws 30µA from the source when $V_{in} = 0V$ (low) and less than 1µA when V_{in} is high.

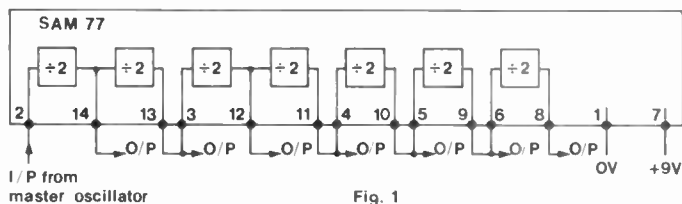


Fig. 1

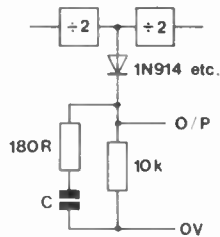
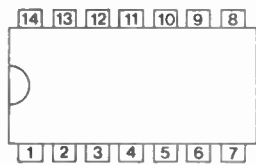


Fig. 2



Pin connections (shown from above)

STAGE OF DIVISION	C (MFD)
1st	0.01
2nd	0.022
3rd	0.047
4th	0.1
5th	0.15
6th	0.33
7th	0.68



For squarewave output connect as Fig. 1.
For sawtooth output connect as Fig. 2.

Specification

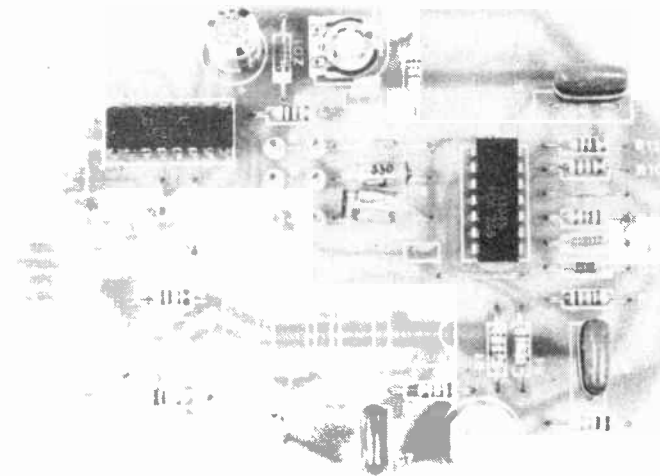
Supply voltage (pin 7):	+5V to +15V (pin 1 = 0V)
Supply current:	5µA ($V_{DD} = 5V$) 10µA ($V_{DD} = 10V$) 50µA ($V_{DD} = 15V$)
Output current (low):	0.8mA ($V_{DD} = 5V, V_O = 0.5V$) 1.6mA ($V_{DD} = 10V, V_O = 0.5V$) 2.5mA ($V_{DD} = 15V, V_O = 0.5V$)
Output current (high):	-0.8mA ($V_{DD} = 5V, V_O = 4.5V$) -1.6mA ($V_{DD} = 10V, V_O = 4.5V$) -2.5mA ($V_{DD} = 15V, V_O = 4.5V$)
Propagation delay (per division stage):	500ns ($V_{DD} = 5V$) 250ns ($V_{DD} = 10V$)
Max. input frequency:	2.5MHz ($V_{DD} = 5V$) 5MHz ($V_{DD} = 10V$)
Crosstalk (one stage to another):	70dB (with 5kΩ, 50pF load)
Input capacitance	5pF
Power dissipation	200mW

Order

QL02C (SAM77)

98p

Digital Master Oscillator DMO2 Mk IV



Features

- 13 Master Frequencies on one tiny circuit board.
- Each frequency digitally derived from a SINGLE h.f. master oscillator.
- Master oscillator temperature compensated to give negligible drift.
- Initial tuning for the WHOLE ORGAN: ONE SIMPLE ADJUSTMENT
- Relative tuning NEVER DRIFTS.
- External control (optional) allows instant tune-up to other musicians.
- Outputs will directly drive CMOS or MOS dividers, the SAM77 or TTL directly. At the same time outputs may be used as direct tone sources.
- Variable depth and rate frequency shift tremulant (optional extra).
- Plug-in edge connection gold-plated.
- Complete fibre glass board built and tested and including tremulant (if required) ONLY 3.7 x 3.75ins.
- Fully guaranteed against faulty manufacture.

Note	Frequency of DMO	Frequency on Equal Tempered Scale	Percentage error
C4	261.42	261.62	-0.076%
C#4	277.07	277.19	-0.043%
D4	293.33	293.66	-0.112%
D#4	310.84	311.12	-0.099%
E4	329.71	329.62	+0.027%
F4	349.05	349.23	-0.052%
F#4	369.70	370.00	-0.081%
G4	391.72	392.00	-0.071%
G#4	415.15	415.31	-0.039%
A4	440.00	440.00	0%
A#4	466.27	466.16	+0.024%
B4	493.91	493.88	+0.006%
C5	522.84	523.24	-0.076%

The DMO2 is a top octave frequency generator intended primarily for electronic organs. The outputs act as direct tone sources for the top thirteen notes of an organ and these notes (excluding the top note) also act simultaneously as tone sources for the divider chain feeding all the other notes on the organ. The DMO2 Master Oscillator frequency is extremely stable, but if playing with other musicians it is advisable to allow the DMO2 to warm up for about five minutes. If playing solo this slight drift after switch on will be completely inaudible. After five minutes the typical frequency drift is 0.04%, considerably less than most stringed instruments,

and their players will find it most useful to have such a stable frequency to tune up against. The external tuning potentiometer (optional extra) has a range of ± 1 semitone, which coupled with the preset potentiometer on board gives ample range.

The DMO2 will generate the frequencies of any C to C octave of 13 notes and has a maximum top frequency of 9kHz or lowest frequency of 15Hz.

The tremulant provided on the DMO2T has a variable rate and depth. The rate is variable between 1Hz and 8Hz and the depth is variable up to ± 1 semitone.

The output voltage with no load (open circuit) is around 11V peak to peak square wave and all outputs have a balanced 3k5 impedance.

With one SAM77 and one direct tone source the output voltage is reduced to around 10V peak to peak on all outputs.

With one TTL (e.g. SN7493) and one direct tone source the voltage on all outputs is around 6V peak to peak.

If you are driving more than one tone source directly (as well as the MOS divider) the load resistor should be calculated such that the total load across the output is around 6k6. The other outputs may be used to drive the MOS divider and distribution resistors directly without the need for any load resistors.

The accuracy of the frequency generated with respect to any other frequency generated is extremely high. For maximum accuracy tune G# to the exact frequency it should be, then no other note will be more than 0.08% out of tune. The table shows the actual frequency generated with 'A' tuned to the international standard 440Hz. For frequencies of other octave ranges multiply or divide every frequency by two.

By linking pins as shown in Fig. 5 and adjusting the two on-board preset potentiometers it is possible to set the DMO to generate any range of C to C from C0 to C1 up to C8 to C9. Tune preset A to the required frequency and check that every note plays cleanly. If any note is harsh, has no sound output, or is intermittent, adjust preset B until all the notes play correctly.

Thus with a set of DMO's it is possible to construct a free phase organ requiring minimal adjustment. Each octave can have its own DMO and with DMO2T's each one can have its tremulant set at a different rate producing (with good tone colouring) one of the most pleasing sounds possible with an electric organ. The power supply in Fig. 1 will drive up to ten DMO's. The slight drift inherent in the DMO is essentially a drift with temperature change, but even this will only be noticeable in a free phase organ. If possible stack the DMO's upright side by side so that any heat rises through all the DMO's ensuring that each one drifts by the same amount. Thus the whole organ will drift together and this slight change will be inaudible.

Fig. 1 shows a power supply suitable for driving the DMO and when coupled with Fig 2 has sufficient power to drive twelve SAM77's as well.

Fig. 3 shows a suitable addition to Fig.1 for driving up to 21 TTL SN7493's.

Note that neither Fig.2 or Fig.3 incorporate short circuit protection so care should be taken to ensure that accidental short circuit of the outputs never occurs or TR1 will be destroyed immediately.

Fig.4 shows where to connect the external control potentiometers.

If you wish to cut out the tremulant altogether on the DMO2T connect a link between pins 1 and 10. Note that it will not be possible to remove the tremulant altogether unless a fully stabilised power supply such as Fig.1 is used.

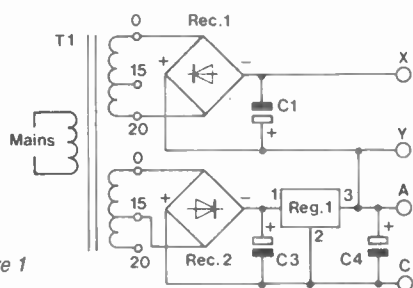


Figure 1

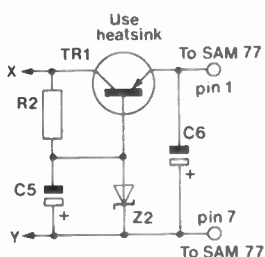


Figure 2

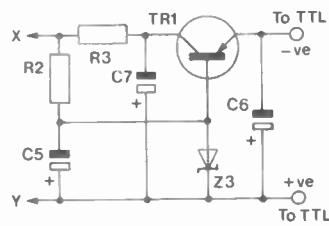


Figure 3

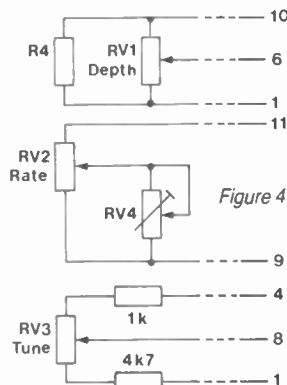


Figure 4

notes	freq	straps
C ₈ -C ₉	4-8KHz	nil
C ₇ -C ₈	2-4KHz	nil
C ₆ -C ₇	1-2KHz	nil
C ₅ -C ₆	500Hz-1KHz	a-a
C ₄ -C ₅	250-500Hz	a-a
C ₃ -C ₄	125-250Hz	b-b
C ₂ -C ₃	62-125 Hz	b-b
C ₁ -C ₂	31-62Hz	c-c, b-b, a-a.
C ₀ -C ₁	16-31Hz	c-c, b-b, a-a.

Figure 5

DMO2(T) outputs

Output pin	Function
1	0V line. Connect to A on the power supply
2	Spare
3	Spare
4	-15V line. Connect to C on power supply.
5	Location slot.
6	Wiper of "depth" control (DMO2T only).
7	Spare
8	Wiper of "tune" control.
9	Wiper of "rate" control (DMO2T only).
10	Top end of "depth" control track (DMO2T only).
11	Top end of "rate" control track (DMO2T only).
12	Lower C output.
13	D output.
14	D# output.
15	F output.
16	F# output.
17	A output.
18	A# output.
19	G output.
20	G# output.
21	B output.
22	Upper C output.
23	E output.
24	C# output.

Component list:

R2	Min Res 1k Ω
R3	W.W Min 22 Ω
R4*	Min Res 150 Ω
RV1*	Pot Lin 1k
RV2*	Pot Lin 47k
RV4*	Vert S-Min Preset 10k
C1	Axial 680 μ F 40V
C3	Axial 1000 μ F 35V
C4	Axial 10 μ F 25V
C5	Axial 220 μ F 35V
C6	Axial 10 μ F 25V
C7	Axial 2200 μ F 35V
Z2	BZX61C9V1
Z3	BZX61C5V6
TR1	BD132
REC1	W04 Bridge
REC2	W04 Bridge
REG1	μ A78M15UC Plastic
T1	TR 20V 1A Also required
1	Kit P Plas
1	Kit TO126
1	Heatsink 10DN

(TR1 and REG1 can both be mounted on the one heatsink). *These parts are supplied free with the DMO2T and are not required with the DMO2. The DMO2(T) requires a -15V supply at typically 50mA. The tune control shown in Fig. 4 is an optional extra and allows the DMO to be fine-tuned from the organ console. If you want this facility you will require the following parts.

1	Pot Lin 10k (RV3)
1	Min Res 1k Ω
1	Min Res 4.7k Ω

If Figs 2 and 3 are not being used then T1 can be a Min Tr 15V (WB15R) with the second winding left open circuit. The only additional parts you will require will be REC2, C3, REG1 and C4.

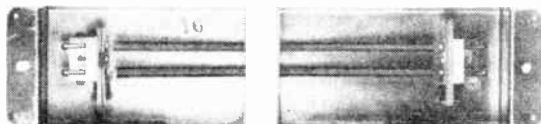
Order

XB10L (DMO2)	£14.95
XB11M (DMO2T)	£16.95

SPRING LINE UNITS AND DRIVER MODULE

This high quality reverberation system may be used with any electronic musical instrument to give a diminishing echo effect similar to that heard in large concert halls and cathedrals. Bring your music alive with the "concert hall sound" in your own living room. This complete reverberation system with a choice of two spring lines is described below.

Short Spring-Line unit



Two 145mm long springs.
 Overall length: 206mm
 *Reverb time: 2.5 to 3secs.
 Max. delay time: 25 to 35msec.
 Drive coil impedance: 16ohms
 Output coil impedance: 10kohms

Order

XL08J (Short Spring Line) **£6.95**

Rubber Coupling

For use with our short spring-line (XL08J), the coupler drastically reduces transmission of acoustic shocks and vibrations to the springs. The coupler has a 4BA stud on each end.

Dimensions

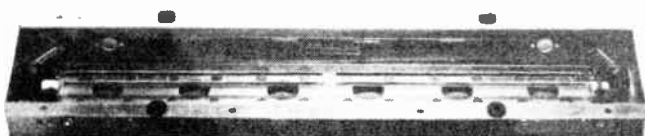
Rubber length: 9mm
 Rubber diameter: 9.5mm
 Overall length: 29mm



Order

FB98G (Rubber Coupling) **78p**

Long Spring-Line Unit



Two 355mm long springs.
 Overall length: 432mm
 *Reverb time: 7 secs
 Max delay time: 35 to 45msec
 Drive coil impedance: 8ohms
 Output coil impedance: 2.8kohms.

Order

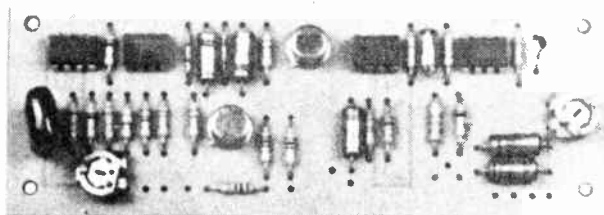
XB84F (Long Spring Line) **£10.95**

Note:

On both lines the negative of the output is connected to the case. Do not connect any separate earth to the case; it is earthed through the driver module.

*Reverb time is the time taken for the output to fall 60dB after disconnection of the input.

Driver Module



The MES Driver Module is a spring-line driver using four integrated circuits. It may be used to drive most types of spring-line. A straight through amplifier is provided having a linear frequency response and an intrinsic gain of approximately 23dB. Part of the signal is tapped off, amplified and used to drive the spring-line. The output of the spring-line can then be mixed with the straight through signal to give the desired amount of reverberation. The balance control allows the output to be

continuously variable between straight through only with no reverberation, and all reverberated sound with no straight through sound present. Most types of electronic musical instrument may be directly connected and the output taken to either a pre-amplifier or power amplifier. However, low-level microphones, magnetic cartridge record players, and a direct output from a tape head on a tape-recorder will need amplifying (in some cases with special characteristics) before connection. If one of these latter sources is being used, the best place for connection of this unit is between your pre-amplifier and power amplifier.

Technical Details

Supply voltages +15V \pm 2V smoothed at 20mA max (typical 15mA) and -15V \pm 2V smoothed at 20mA max (typical 15mA).
 Input sensitivity (for max. output) 35mV RMS.
 Max input (before overload with input level control almost fully clockwise) 30mV.
 Output level (max) 500mV RMS.
 Output impedance: Low
 Straight through frequency response: 15Hz to 15kHz +0dB -3dB (ref: 1kHz = 0dB).

MES Reverb Driver Module

Includes:

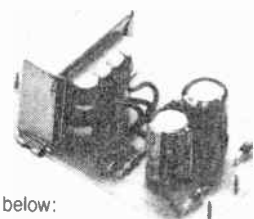
- 1 Printed circuit board ready built and tested.
- 1 Balance control.
- 2 Mono jack sockets.
- 2m Screened cable.
- 1m Each of seven different colour connection wire.
- 1 Installation instruction sheet.

Order

XB85G (MES Driver Module) **£5.95**

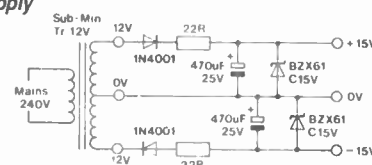
Power Supply For MES Driver Module

A simple power supply capable of driving the reverb module is shown below:



Parts list for suggested power supply

- 1 Sub Min Tr 12V
- 2 1N4001
- 2 Min Res 22 Ω
- 2 Axial 470 μ F 25V
- 2 BZX61C15V



Power Supply Module

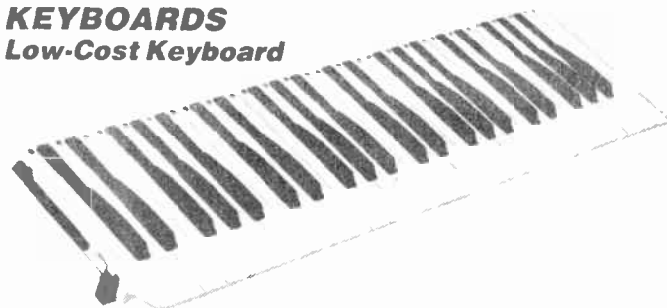
A ready-built version of this power supply is available. Link the +15V, 0V and -15V points on the power supply board to the pin of the same name on the Driver Module with the connection wire. Connect to the AC mains pins and earth tag with a mains cable.

Order

YL17T (Reverb PSU Module) **£3.95**

KEYBOARDS

Low-Cost Keyboard



An economically priced keyboard having plastic keys pivoted on a hard-wearing moulded fulcrum.

Dimensions:

Overall width (end to end) 26 $\frac{1}{2}$ in, 677mm
 Width of mounting frame & rear hinge 26 $\frac{1}{2}$ in, 674mm
 Overall depth (front to back) 8in, 204mm
 Overall height 2 $\frac{3}{4}$ in, 60mm

Order

XB17T (Mid Kbd 49 - Note C - C) **£19.95**

High Quality Keyboards



High quality keyboards having hard-wearing plastic keys (white naturals and black sharps) mounted on nylon-bushed steel levers. Keys are mounted on a pressed steel frame with adjustable return springs on each key. The entire keyboard is hinged along the back to facilitate simple contact maintenance after the keyboard is fitted.

48 note F to E with fiat fronted keys.

Dimensions:

Overall width (end to end)	25 ³ / ₄ in, 655mm
Width of mounting frame & rear hinge	25 ¹ / ₂ in, 650mm
Overall depth (front to back)	8 ⁵ / ₁₆ in, 220mm
Overall height	2 ³ / ₁₆ in, 60mm

Order

XB14Q (Keyboard 48-Note) £29.95

49 note C to C with modern sloping-fronted keys.

Dimensions:

Overall width (end to end)	26 ¹ / ₂ in, 675mm
Width of mounting frame & rear hinge	26 ¹ / ₄ in, 666mm
Overall depth (front to back)	9 ¹ / ₄ in, 235mm
Overall height	2 ³ / ₁₆ in, 60mm

Order

XB15R (Keyboard 49-Note) £29.95

61 note C to C with modern sloping-fronted keys.

Dimensions:

Overall width (end to end)	33in, 838mm
Width of mounting frame & rear hinge	32 ³ / ₄ in, 830mm
Overall depth (front to back)	8 ⁵ / ₁₆ in, 213mm
Overall height	2 ³ / ₁₆ in, 60mm

Order

XB16S (Keyboard 61-Note) £39.95

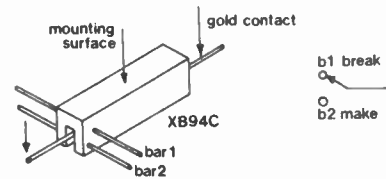
Replacement plastic keys are available should any keys be damaged. To replace key, tap on the front and lever off with a screwdriver at the rear. Glue new key cover on to lever with Araldite.

KEYBOARD ACCESSORIES

Assembling the Keyboards and Accessories

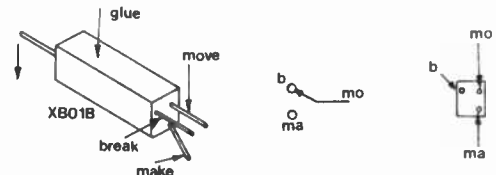
There has been some confusion in the past on how to assemble the music keyboards; in particular the construction and mounting of the contact blocks and various accessories. Normally the contacts are mounted to a fixed board or panel below, but unattached to, the keyboard, in such a position and on a level where the key plungers can operate the contacts satisfactorily. In this way the keyboard can be lifted up from the front on its rear hinge making the contacts accessible for maintenance. Possible permutations of switching functions are as follows:-

Single Pole changeover from two commoned bus bars, use contact blocks 1WG (XB94C) and bus bars (XB04E).

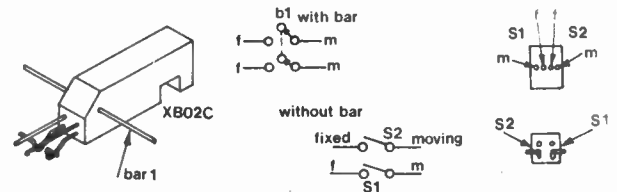


Bus bars have to be soldered together to form long continuous lengths from one end of the keyboard to the other. Contact blocks are glued to their mounting board in the correct position.

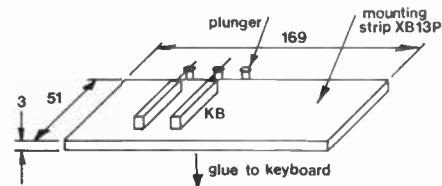
Single Pole changeover, independent contacts (not commoned), use contact blocks GJ (XB01B).



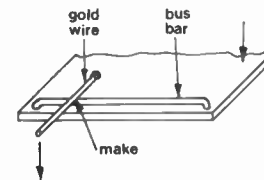
Double Pole make only, independent contacts (not commoned), use contact blocks GB2 (XB02C). Alternatively a bus bar may be included producing double pole break operation from one common bus, or even double pole changeover from a common bus (in the rest position) to independent contacts (in the depressed position). In the latter case, the contacts should make before break.



To make things simpler the contact blocks may be mounted directly to the underside of the keyboard. The blocks can be glued to a keyboard mounting strip (XB13P), one of which should be long enough for a full octave of contacts. Roughen the surface of the paxolin strip lightly with sandpaper before gluing. The complete assembly may be attached to the underside of the keyboard with self-tapping screws.



A cheap alternative to contact blocks if one simple 'make' action is required, would be to solder a bus bar to a strip of Veroboard and use short lengths of gold contact wire (XB00A) arranged to contact the bus bar when depressed by the key plungers. The gold wires would be soldered to one of the other conductor strips of the Veroboard.



NB. Before gluing contact blocks ensure they are the correct way up for correct operation, and spaced according to the distance between key plungers. A strong adhesive such as Araldite should be used for a solid assembly.

Mounting Strips

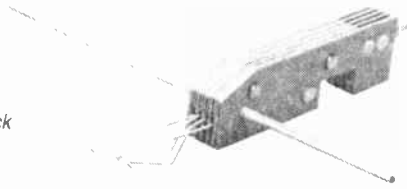
Strips of undrilled SRBP for mounting contact blocks on our keyboards. Each strip measures approx. 169 x 51mm and covers one octave, thus four strips are required on the 48 or 49 note keyboards and 5 strips are required on the 61 note keyboard. Use a strong adhesive (e.g. Araldite) to glue the strips to the keyboard and the contact blocks to the strips.

Order

XB13P (KB Mounting Strip) 58p

Contact Blocks

Picture shows Contact Block GB2 with Earth Bar fitted.



Contact blocks made of laminated bakelite thus giving smooth walls to the slots and allowing completely free movement of the contact wires. The contact wires are gold-clad phosphor-bronze and are spaced in the slots at 0.04in pitch. Body length is 36.5mm and wire contacts overhang by 24mm max. A hole is provided in the block to allow the palladium earth bar to be threaded through. The 1WG contact block has holes for two earth bars and the single wiper then makes and breaks between the two bars. It is intended primarily for use on touch-sensitive pianos. The following types are available. Single wire, 1-pole changeover, 2-pole make.

Order

XB94C (Contact Block 1WG)	38p
XB01B (Contact Block GJ)	45p
XB02C (Contact Block GB2)	78p

Contact Springs



Silver-plated sprung-steel springs for use as contacts on organ keyboards. One end is belled slightly to facilitate soldering. Overall length: 48mm (can be cut to any length). Diameter: 1.4mm. Diameter of bell: 2.3mm.

Order

QY07H (Contact Springs)	9p
--------------------------------	----

Gold Contact Wire

Gold-clad phosphor-bronze wire suitable for making contacts on keyboards. Gold-cladding eliminates oxidation and gives long lasting and reliable contact. 0.4mm dia (27 swg). Supplied in 1 metre lengths only.

Order

XB00A (Gold Wire)	£2.40
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Palladium Earth Bar

Palladium plated copper bar (18 swg) has a non-corroding hard-wearing surface (replaces Rhodium) for use as earth bar on organ key contacts. (7in lengths nominal).

Order

XB04E (Earth Bar)	20p
--------------------------	-----

Spacer Block

A spacer block which can be fitted to a pcb then used to support two bus bars correctly spaced. On the pcb drill one 2.5mm hole, then a 1.35mm hole, 4mm (centres) from the first one. Bus bars are 2mm diameter and spaced 1.5mm apart. Excluding pcb mounting pegs, overall size is 11.5 x 6 x 7.5mm high.



Order

BH62S (Spacer Block)	6p
-----------------------------	----

Keyboard Spacer

A spacing washer designed to be inserted between the keyboard frame and the bus-bar mounting pcb so that the contact springs and bus-bars will be at the correct height one to the other when used with Spacer Blocks. Spacer is 10.5mm diameter with a 4mm diameter centre hole and is 4mm thick.



Order

BH63T (Keyboard Spacer)	2p
--------------------------------	----

STOP TABS



Rocker type stop tabs. DPDT switch with light noiseless action and plastic cover available in Black, Green, Grey, Ivory, Maroon, Orange, Red and White. The switch and cover are supplied together but are not joined to facilitate engraving or labelling. To fix together glue carrier to switch and cover to carrier with any plastic glue e.g. Evostik Impact, Bostik, UHU or Airfix etc. It is most important that a very thin layer of glue is used.

Order

FL66W (Stop Tab Black)	85p
FL68Y (Stop Tab Green)	85p
FL69A (Stop Tab Grey)	85p
FL70M (Stop Tab Ivory)	85p
FL71N (Stop Tab Maroon)	85p
FL72P (Stop Tab Orange)	85p
FL73Q (Stop Tab Red)	85p
FL74R (Stop Tab White)	85p

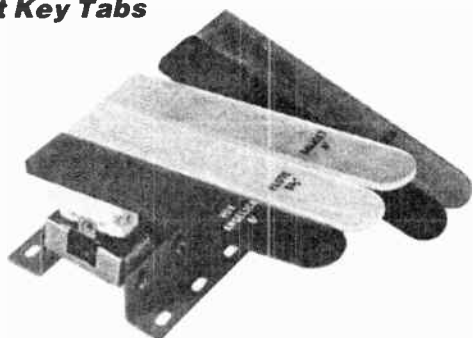
Engraved Stop Tabs

The above stop tabs complete with switch and cover which is ready engraved. The following legends are available:

Code	Engraving	Colour of cover
BR05F	ACC DEL TREM	Green
BR47B	BASS GUITAR	White
BR67X	BOURDON 8'	Black
BR06G	CELLO 16'	White
BR07H	CLARINET 8'	Grey
BR08J	CLARION 4'	Red
BY00A	CLAVICHORD	Green
BY01B	D.B TO ROTOR	Blue
BY02C	DELAY VIBRATO ACC	Green
BY03D	DELAY VIBRATO SOLO	Green
BR68Y	DIAPASON 16'	Black
BR10L	DRAWBARS ACC	Green
BR11M	DRAWBARS SOLO	Green
BR12N	DULCIANA 8'	Black
BR13P	FLUTE 1'	Red
BR14Q	FLUTE 2'	Red
BR15R	FLUTE 2 2/3'	Red
BR17T	FLUTE 5 1/3'	Red
BR21X	GEDECKT 8'	Black
BY05F	GEDECKT 16'	Black
BY06G	HONKY TONK	Green
BR22Y	HORN 8'	Red
BY07H	MIXTURE 16'	Grey
BR23A	OBOE 8'	Grey
BR24B	OCTAVE 4'	Black
BR25C	PEDAL SUSTAIN	Green
BY08J	PIANO	Green
BR26D	REVERB	Green
BY12N	ROTOR FAST	Blue
BY13P	ROTOR TO MAIN	Blue
BR27E	SALICET 4'	Black
BR28F	SALICIONAL 8'	Black
BR29G	SAXOPHONE 16'	Grey
BR30H	SOLO DEL TREM	Green
BR31J	STRING 4'	White
BR32K	STRING 8'	White
BR33L	SUB-BASS 16'	Black
BY14Q	SUSTAIN ACC	Green
BY15R	SUSTAIN SOLO	Green
BR34M	TREMULANT	Green
BR35Q	TRUMPET 8'	Red
BR36P	TUBA 16'	Red
BY16S	VIBRATO	Green
BR37S	VOX ANGELICA 8'	Black
BR38R	VOX HUMANA 8'	Black

Order		
BR05F	(S Tab Acc Del Trem)	£1.20
BR47B	(S Tab Bass Guitar)	£1.20
BR67X	(S Tab Bourdon 8')	£1.20
BR06G	(S Tab Cello 16')	£1.20
BR07H	(S Tab Clarinet 8')	£1.20
BR08J	(S Tab Clarion 4')	£1.20
BY00A	(S Tab Clavichord)	£1.20
BY01B	(S Tab D/B to Rotor)	£1.20
BY02C	(S Tab Dly Vbrato Acc)	£1.20
BY03D	(S Tab Dly Vbrto Solo)	£1.20
BR68Y	(S Tab Diapason 16')	£1.20
BR10L	(S Tab Drawbars Acc)	£1.20
BR11M	(S Tab Drawbars Solo)	£1.20
BR12N	(S Tab Dulciana 8')	£1.20
BR13P	(S Tab Flute 1')	£1.20
BR14Q	(S Tab Flute 2')	£1.20
BR15R	(S Tab Flute 2.2/3')	£1.20
BR17T	(S Tab Flute 5.1/3')	£1.20
BR21X	(S Tab Gedeckt 8')	£1.20
BY05F	(S Tab Gedeckt 16')	£1.20
BY06G	(S Tab Honky Tonk)	£1.20
BR22Y	(S Tab Horn 8')	£1.20
BY07H	(S Tab Mixture 16')	£1.20
BR23A	(S Tab Oboe 8')	£1.20
BR24B	(S Tab Octave 4')	£1.20
BR25C	(S Tab Pedal Sustain)	£1.20
BY08J	(S Tab Piano)	£1.20
BR26D	(S Tab Reverb)	£1.20
BY12N	(S Tab Rotor Fast)	£1.20
BY13P	(S Tab Rotor To Main)	£1.20
BR27E	(S Tab Salicet 4')	£1.20
BR28F	(S Tab Salicional 8')	£1.20
BR29G	(S Tab Saxophone 16')	£1.20
BR30H	(S Tab Solo Del Trem)	£1.20
BR31J	(S Tab String 4')	£1.20
BR32K	(S Tab String 8')	£1.20
BR33L	(S Tab Sub Bass 16')	£1.20
BY14Q	(S Tab Sustain Acc)	£1.20
BY15R	(S Tab Sustain Solo)	£1.20
BR34M	(S Tab Tremulant)	£1.20
BR35Q	(S Tab Trumpet 8')	£1.20
BR36P	(S Tab Tuba 16')	£1.20
BY16S	(S Tab Vibrato)	£1.20
BR37S	(S Tab Vox Anglica 8')	£1.20
BR38R	(S Tab Vox Humana 8')	£1.20

Marble-Effect Key Tabs



Note: These tabs are supplied with a high quality switch, not the switch shown in the picture.

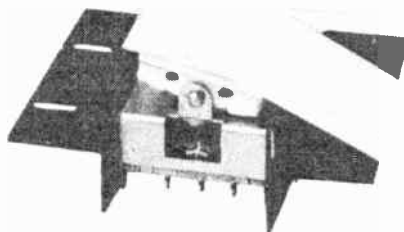
A very high quality key tab in highly polished marble-effect plastic. The tab is supplied with a very high quality switch with nickel silver contacts which are single-pole changeover. The felt 'stops' on the switch are adjustable to give correct positioning of the tabs. The tabs may be fixed to the switch using our Quickstick Pads described on page 144 and these must be ordered separately. The tabs are available in various colours and with various legends engraved on them. Please note that this range is being discontinued and only the following legends are still available:

Order As	Engraving	Colour of cover
BY17T	CELLO 16'	Yellow
BY20W	CLAVICHORD	Green
BY23A	DELAY VIBRATO SOLO	Green
BY26D	DRAWBARS ACC	Black and Gold
BY27E	DRAWBARS SOLO	Black and Gold
BY36P	FRENCH HORN 8'	Red
BY37S	GEDECKT 8'	White
BY38R	GEDECKT 16'	White
BY39N	HONKY TONK	Green
BY42V	OBOE 8'	Red
BY44X	PEDAL SUSTAIN	Green

Order As	Engraving	Colour of cover
BY45Y	PIANO	Green
BY50E	ROTOR FAST	Black and Gold
BY55K	STRING 4'	Yellow
BY57M	SUB-BASS 16'	White
BY58N	SUSTAIN ACC	Green
BY59P	SUSTAIN SOLO	Green
BY62S	VIBRATO	Green
BY63T	VOX ANGELICA 8'	Red

Order		
BY17T	(Mar Ky Tab Cello 16')	£3.45
BY20W	(Mar Key Tab Clav)	£3.45
BY23A	(Mr Ky Tb Dly Vbr Slo)	£3.45
BY26D	(Mar K Tab Dbar Acc)	£3.45
BY27E	(Mar K Tab Dbar Solo)	£3.45
BY36P	(Mr Ky Tb Frch Hrn 8')	£3.45
BY37S	(Mar Key Tab Gedkt 8')	£3.45
BY38R	(Mr Key Tab Gedkt 16')	£3.45
BY39N	(Mar Key Tab Hnky Tnk)	£3.45
BY42V	(Mar Key Tab Oboe 8')	£3.45
BY44X	(Mar Key Tab Pdl Sus)	£3.45
BY45Y	(Mar Key Tab Piano)	£3.45
BY50E	(Mar Key Tab Rtr Fst)	£3.45
BY55K	(Mar Key Tab Strng 4')	£3.45
BY57M	(Mar Ky Tb Sb-Bss 16')	£3.45
BY58N	(Mar Key Tab Sus Acc)	£3.45
BY59P	(Mar Key Tab Sus Solo)	£3.45
BY62S	(Mar Key Tab Vibrato)	£3.45
BY63T	(Mar K Tab Vox Ang 8')	£3.45

Key Tabs



A key type stop tab, DPDT switch with light noiseless action and plastic cover available only in white. The switch and cover are supplied together, but not joined to facilitate engraving or labelling. To fix, glue together using a plastic glue e.g. Evostick Impact, Bostick, UHU, plastic modeller's polystyrene cement etc.

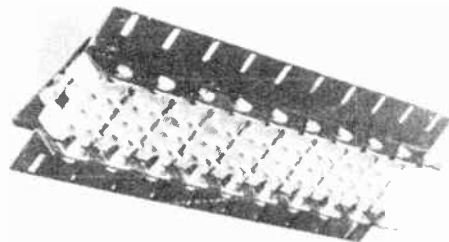
Order

FL76H (Key Tab)	£2.95
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Stop Tab Mounting Strips



Fully drilled strips for mounting stop tabs and key tabs. Two strips (top and bottom) will hold 20 switches or one strip may be sawn in half to hold 10 switches etc. Stop tabs fit on the ST strip, key tabs fit on the KT strip.



The marbled key tabs are best mounted directly onto a piece of wood, but they could be mounted on the ST strip if desired.

Order

BR46A (ST Strip)	98p
XX13P (KT Strip)	98p

Drawbar



Blue, Green, Red or White moulded drawbar operating a 20k linear potentiometer.

Tolerance $\pm 20\%$

Carrier dimensions: 100 x 20 x 38mm high

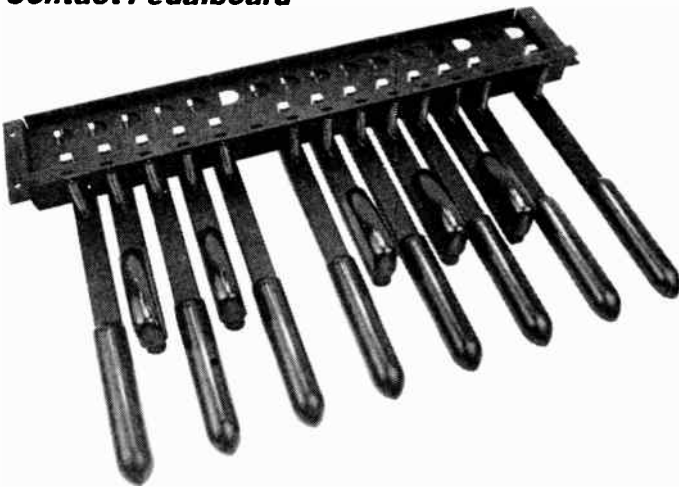
Bar dimensions: 147 x 18 x 27mm high

Order

BR41U (Drawbar Red)	£1.50
BR42V (Drawbar White)	£1.50
BR98G (Drawbar Blue)	£1.50
BR99H (Drawbar Green)	£1.50

PEDALS

Contact Pedalboard

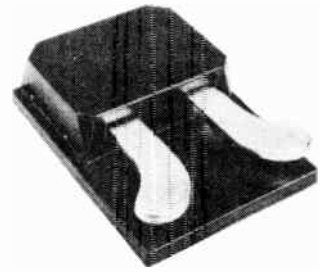


A high quality 13-note C to C pedalboard. Notes are hard-wearing plastic covered steel levers. Board is only available with double-pole changeover contacts fitted to each key.

Order

XB18U (Contact Pedal Board)	£24.95
-----------------------------	--------

Piano Pedals



A pair of piano type pedals in a neat black box with rubber feet. A free-standing unit, it is ideal for electronic pianos. Each pedal operates its own single changeover (SPDT) contact. Contacts have solder tags and the cable passes through a grommet in the rear of the box, via a cable grip. Overall height: 57mm.

Order

XB21X (Piano Pedal)	£11.95
---------------------	--------

FOOTSWELL CONTROLS

Chassis Type



Swell pedal 250mm x 120mm fitted with a 10k log pot. Designed to be mounted in a console.

Order

XB20W (Swell Pedal)	£11.95
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Enclosed Type



Swell pedal 243 x 100mm fitted with a 100k log pot. Pedal has a black crackle-finish metal, free-standing base. Supplied with 1m of cable terminated in a standard mono screened jack plug.

Order

XY28F (Remote Foot Control)	£12.95
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PANEL METERS

Car Meters	215	Moving Coil	215
Digital Meters	216	Moving Iron	216

BATTERY CHARGER AMMETER



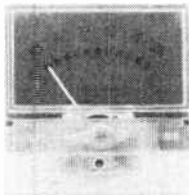
An attractive square ammeter suitable for use in battery chargers. Marked 0 to 6 amps. Size of front face 48 x 48 x 8mm. Panel cut-out required: 43mm (1.75in.). Overall depth behind panel: 32mm. Supplied with easy fixing bracket.

Order

HQ35Q (Charger Ammeter) £1.98

MOVING COIL METERS

Signal Strength Meter

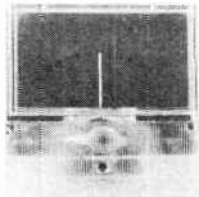


A square-faced signal strength meter which may be back-lit to show up a green scale. Scale is marked 'Signal' and 0 to 5 for calibration. Sensitivity: 250µA FSD Internal resistance: 675Ω ±5% Dimensions: 40 x 40 x 29mm

Order

LB80B (Sig Strength Meter) £2.95

Tuning Meter

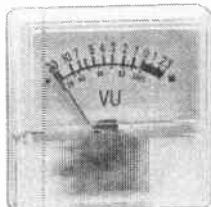


A square-faced tuning meter which may be back-lit to show up a green scale. Scale is marked 'Tune' and meter has a centre-zero movement. Sensitivity: 125-0-125µA FSD Internal resistance: 675Ω ±5% Dimensions: 40 x 40 x 29mm

Order

LB79L (Tuning Meter) £2.95

VU Meter



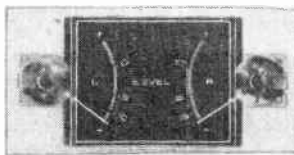
A square-faced VU meter which may be back-lit to illuminate scale, which is marked -20 to 0dB in white and then 0 to +3dB in red. Also marked 0 to 100%.

Sensitivity: 130µA at 0dB, 200µA at FSD. Internal resistance: 1200Ω Dimensions: 40 x 40 x 29mm.

Order

RW73Q (VU Meter) £2.95

Dual VU Meter



Two VU meters marked 'R' and 'L' for use with stereo equipment. The meter may be back-lit to illuminate green and red scale. Scale is marked from -20 to 0dB in green, then 0dB to +3dB in red.

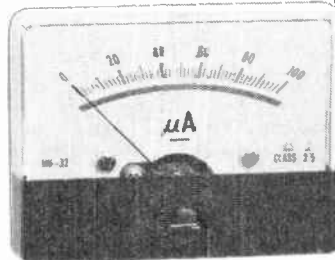
Sensitivity: 150µA at 0dB, 280µA at FSD Internal resistance: 1000Ω Dimensions: Overall: 80 x 40 x 23mm deep Scale: 45 x 36mm Scale is raised by 2mm.

Order

YQ47B (Dual VU Meter) £3.95

Rectangular Meters

STAR BUY



A range of modern styled panel meters with snap-on plastic covers which can be removed to change scales or to fit scale illumination bulbs (please note that we cannot supply alternative scales). Plastic cover has a black lower portion with zero adjuster. The movement is wired to the larger pair of terminals at rear which include solder tags retained by M2.5 screws.

Front face size: 60 x 46mm Overall depth: 42mm Panel cut-out: 38mm (1.5in.) Accuracy: 2%

The following types (full scale deflection: FSD) are available.

FSD	Internal resistance	Scale marked
100-0-		
100µA DC	1100Ω	In 4µA steps
50µA DC	4300Ω	0 to 50µA in 1µA steps
100µA DC	3750Ω	0 to 100µA in 2µA steps
1mA DC	200Ω	0 to 1mA in 20µA steps
100mA DC	0.8Ω	0 to 100mA in 2mA steps
1A DC	0.1Ω	0 to 1A in 20mA steps
VU Meter	5250Ω	-20 to 0 to +3 VU (Volume Units) and 0 to 100%

Order

RW98G (2in Pn Mt 100-0-100uA) £6.95
 FM98G (2in. Pan Meter 50uA) £6.95
 RW92A (2in. Pan Meter 100uA) £6.95
 RW94C (2in. Pan Meter 1mA) £6.95
 RX33L (2in. Pan Meier 100mA) £6.95
 RX35Q (2in. Pan Meter 1A) £6.95
 RX53H (2in. Pan Meier 'VU') £6.95

Scale Illumination Lamps



A pair of wire ended bulbs designed to operate at 6.3V. To use the bulbs with the rectangular or large meters, remove the snap on front cover. Carefully remove the scale, at all times avoid damaging the needle and do not lose the two small screws.

For 6V Operation

Strip and solder the ends of four short lengths of fine gauge flexible wire of 1mm or less outer diameter, eg, light duty connection wire. Slide 1/4in. lengths of 1mm sleeving over each to insulate the bulb wires. Secure each bulb into one of the holders provided either side of the zero adjuster arm using a drop of adhesive similar to Bostik, Evostik etc. Carefully run each pair of wires from each bulb to the top rear of the meter body, and push them through hole at each small solder tag at the rear. Trim to length and strip and solder the wires to the centre of each solder tag, make sure both lamps are wired in parallel across the two tags. Make sure the lamps do not foul the needle, meter movement or front cover. Replace front cover. To use, apply 6V AC or DC to the small pair of rear terminals on the meter.

For 12V Operation

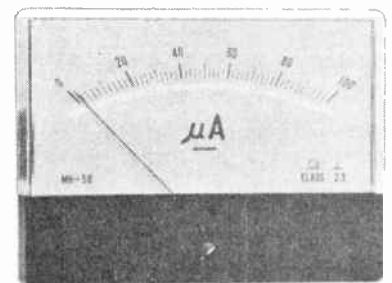
Procedure is identical to above except that only two 1mm wires are needed and the bulbs are connected in series across the two solder tags. To use apply 12V AC or DC to terminals.

Current consumption, each bulb: 45mA @ 6V Dimensions: 10mm x 4mm dia. Lead length: 20mm

Order

YJ97F (Illuminating Kit) 48p

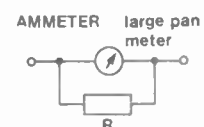
Large Meters



Large moving coil panel micro-ammeters having a 4in scale length. Calibrated 0-50 or 0-100, but front plastic cover unclips to facilitate fitting different scales to your design. (Please note that we do not stock spare scales). Dimensions: 110 x 82 x 46mm deep. Internal resistance 50µA: 4300Ω; 100µA: 3750Ω.

To convert these meters to read larger currents use the following formula:

$$\frac{x}{\text{FSD required (in amps)} - (y \times 10^{-6})} = R$$



Continued on next page.

Large Meters (Continued)

To convert this meter to a voltmeter use the following formula:

$$\left(\frac{\text{Full scale voltage required (V)}}{y \times 10^{-6}} \right) - r = R_2$$

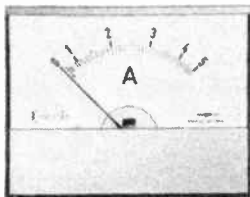


where R is the resistance required directly across the meter; R₂ is the resistance required in series with either lead; x is 0.215 for the 50μA meter and 3.75 for the 100μA meter; y is 50 for the 50μA meter and 100 for the 100μA meter; and r is 4300 for the 50μA meter and 3750 for the 100μA meter.

Order

RX54J (50uA Lrge Pan Meter)	£9.95
YJ96E (100uA Lrge Pan Meter)	£9.95

MOVING IRON METERS



A range of modern styled panel meters which have a transparent plastic cover and a white base. The coil is exposed at the rear and a set zero adjustment is not provided.

The following types are available.

Range	Internal Resistance	Scale marked
2V to 15V	58Ω	0 to 2V then to 15V in 0.5V steps.
0.5A to 5A	0.028Ω	0 to 0.5A then to 5A in 0.1A steps.
2A to 15A	0.004Ω	0 to 2A then to 15A in 0.5A steps.
4A to 25A	0.0018Ω	0 to 4A then to 25A in 0.5A steps.
Front face size:	69.4 x 53.4mm	
Overall depth:	29.1mm	
Panel cutout:	40mm diameter	
Accuracy:	±5%	

Suitable for AC or DC operation.

Order

RX92A (Meter MI 15V)	£9.95
RX90X (Meter MI 5A)	£9.95
RX91Y (Meter MI 15A)	£9.95
RX93B (Meter MI 25A)	£9.95

DIGITAL PANEL METERS LED Type

A compact low-cost LED Digital Panel Meter having a high brightness display. The meter is fitted with high efficiency 11mm LED's and is supplied with a circularly polarised red filter and bezel giving a high contrast display. Auto-zero, auto-polarity, programmable decimal points and 200mV fsd are standard features and the meter may be easily programmed by the user to read volts, current etc. May be used in single-ended or differential mode, or to measure floating inputs.



Specification:

Accuracy (±1 count):	0.05% typical (0.1% max.)
Linearity:	±1 count
Sample rate:	3 per second
Temp. stability:	150ppm/°C
Temp. range:	0°C to 50°C
Supply voltage:	5V (5.5V max.)
Supply current:	100mA (200mA max.)
Max. DC input voltage:	±20V
Input impedance:	100MΩ
Overall dimensions:	72 x 36 x 27mm deep
Panel cut-out:	68 x 33mm.

Supplied with connectors, bezel, mounting hardware and full instruction sheet.

Order

FM85G (LED Panel Meter)	£29.95
--------------------------------------	---------------

LCD Type



An ultra-low power, extremely stable LCD Digital Panel Meter suitable for a wide range of applications. Features: auto-zero; auto-polarity; 200mV fsd; user-adjustable 'low battery' indication; 12.5mm digit height; programmable decimal point. The meter has an external bandgap reference for extra temperature stability, with connections brought out, allowing use in single-ended, differential or ratiometric mode. The fsd can be easily rescaled by the user to indicate volts, amps, ohms etc.

Specification:

Accuracy (±1 count):	0.05% (0.1% max.)
Linearity:	±1 count
Sample rate:	3 per second
Temp. stability:	50ppm/°C
Temp. range:	0°C to 50°C
Supply voltage:	5V to 15V (9V nom.)
Supply current:	200μA
Max DC input voltage:	±20V
Input leakage current:	1pA (10pA max.) (V _{in} = 0V)
Low battery threshold:	7.5V
Overall dimensions:	72 x 41 x 27mm
Panel cut-out:	68 x 33mm

Supplied with bezel, mounting hardware, connectors and full data sheet.

Order

FM86T (LCD Panel Meter)	£29.95
--------------------------------------	---------------

PHONE NOW
0702 552911

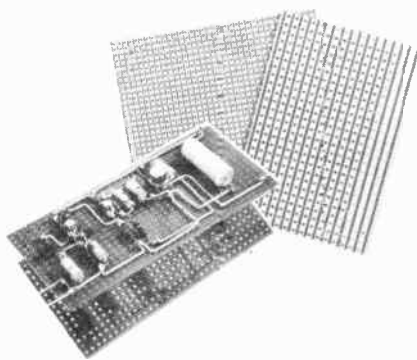


Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

PCB EQUIPMENT

Copper-Clad Boards	221	Plugblocks	218
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VEROBOARDS SRBP Matrix Boards



A range of SRBP boards punched with holes on a 2.54mm (0.1in) matrix. Plain board and boards with copper strips on one side are available in various sizes.

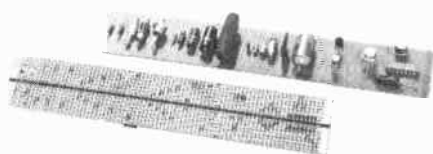
Type	Overall size (mm)	Number of copper strips	Number of holes in each strip
SRBP 0.1in Type 3	127 x 95	None	50 x 36
Vero 14354	63 x 25	10	24
Vero 10345	127 x 63	24	50
Vero 10346	95 x 63	24	37
Vero 10347	127 x 95	36	50
Vero 10348	95 x 95	36	37
Vero 10401	292 x 95	34	115

All boards have 1mm dia. holes and are 1.6mm thick.

Order

FL02C (SRBP 0.1in Type 3)	£1.40
FL06G (Vero 14354)	40p
FL07H (Vero 10345)	£1.40
FL08J (Vero 10346)	£1.30
FL09K (Vero 10347)	£1.60
FL10L (Vero 10348)	£1.40
FL53H (Vero 10401)	£3.40

Verostrip



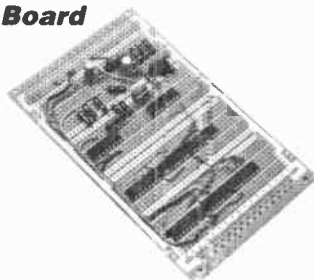
Suitable for all applications where a conventional tag strip or group board might be used, with the advantage that small or large components are neatly accommodated. Components can be mounted across or along the strips. Copper strips run across the board with a break through the centre equal to the width of one hole (0.1in), over the full length of the board.

Overall size:	213 x 38mm
Number of strips:	81
Number of holes in coppered part of each strip:	14
Total number of holes in each strip:	15
Hole size:	1mm dia.

Order

FL17T (Verostrip)	£1.40
-------------------	-------

DIP Board

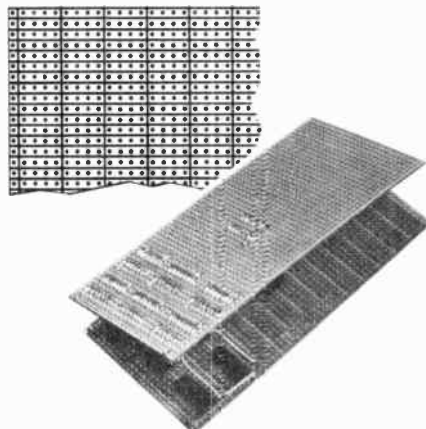


This board is specifically designed to mount dual-in-line integrated circuits and to assist in this two power rails run between the copper pad format to facilitate easy link-up of ground and voltage rail. Up to 20 14-pin or 28 8-pin DIL packages can be accommodated. A paper layout sheet is included. The board is punched on a 0.1 x 0.1in matrix with a 1mm dia. hole. Overall size 157 x 114mm.

Order

FL19V (DIP Board)	£5.95
-------------------	-------

V-Q Board



This board is specifically designed to mount dual-in-line integrated circuits and a great number of these and any other kind of component may be easily mounted. The board has 28 copper strips each with 58 holes and each strip is divided into 14 4-hole segments so that track cutting is virtually eliminated. The non-copper side of the board is marked with white lines denoting the position of the vertical breaks in the copper tracks. A paper layout sheet is included.

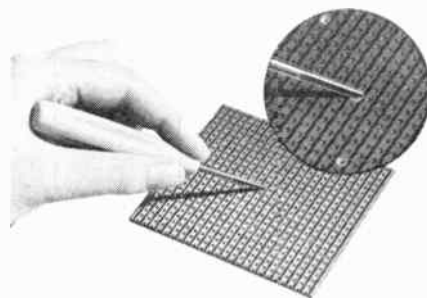
The board is punched on a 0.1 x 0.1in matrix with a 1mm diameter hole. Overall size 148 x 74mm.

Order

HQ48C (Vero V-Q Board)	£2.95
------------------------	-------

**CALL IN TO YOUR LOCAL
Maplin SHOP
in LONDON**
159 King St., Hammersmith ☎01 748 0926

TOOLS FOR MATRIX BOARDS Spot Face Cutter



Designed for accurate and clean breaking of the copper strips on Veroboard. For best results use a light pressure.

Order

FL25C (Tool 2022)	£1.98
-------------------	-------

Pin Insertion Tools



These tools help in the insertion of Veropins into pcb's. Tool 2150 is for 1.3mm dia. pins type 2140 and 2141 and Tool 2151 is for 1mm dia. pins type 2144 and 2145. Tool 2150 has a green handle and tool 2151 has an orange handle to aid identification.

Order

FL26D (Tool 2150)	£2.95
FL27E (Tool 2151)	£2.95

VEROPINS Type 2140

Double-ended pin 1.3mm (0.052in.) dia. Supplied in packs of 100.



Order

FL20W (Pin 2140)	80p
------------------	-----

Type 2141

Single-ended pin 1.3mm (0.052in.) dia. Supplied in packs of 100.



Order

FL21X (Pin 2141)	80p
------------------	-----

Type 2144

Double-ended pin 1mm (0.04in.) dia. Supplied in packs of 100.



Order

FL23A (Pin 2144)	80p
------------------	-----

Type 2145

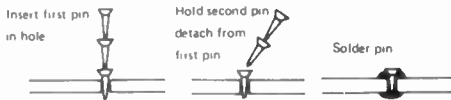
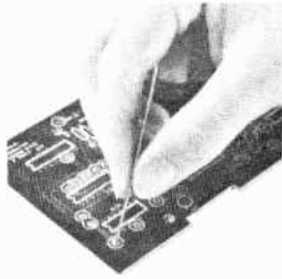
Single-ended pin 1mm (0.04in.). Supplied in packs of 100.



Order

FL24B (Pin 2145)	80p
------------------	-----

Through-PCB Pins



Pins to provide a connection between tracks on opposite sides of printed circuit boards without the need for through-hole plating. Pins are inserted by hand then soldered on both sides. Pins fit 0.04in (1mm) dia holes and are suitable for 1/8in. (1.6mm) thick board. Pins are brass, tin/lead plated. Overall pin length: 0.137in (3.5mm). Supplied in packs of 50 approx.

Order

FL82D (Track Pin) 80p

Wirewrapping Pins



These pins are suitable for wire wrapping and fit holes with a 1mm (0.04in.) dia. Two types are available. Single-sided Pin 0266 sold in packs of 100. Double-sided Pin 1657 sold in packs of 10.

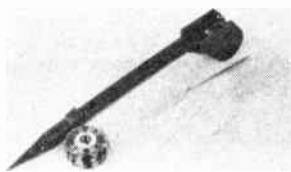
Order

FL80B (Pin 0266 Pk of 100) £2.95
FL81C (Pin 1657 Pk of 10) 38p

WIRE WRAPPING SYSTEM

The wiring system enables fast construction of pcb's etc., requiring large numbers of wire links. It is very simple to use and the end result is neat, even when a large number of wires are packed into a small space. Simply wrap the wire around the terminal pin or component wire, set the tension on the Verowire pen and take the pen to the next component and wrap the wire there. The wire is insulated with a polyurethane coat, which is mechanically tough. Now simply solder the connections: under the extreme heat of the tip of the soldering iron, the polyurethane coat melts and the solder completes the joint.

Prototyping Kit



This kit contains a plastic wiring tool, a spool of 30swg copper wire as described below, and a pack of 25 wiring combs to enable you to assess the system's usefulness. Comes complete with an instruction leaflet.

Order

RK94C (Proto Wiring Kit) £6.95

Prototyping Pen



A plastic wiring tool supplied complete with one spool of wire as described below. Pen has an integral spring wire clamp for wire retention, advancement and retraction.

Order

HY16S (Wiring Pen) £4.95

Replacement Spools for Pen

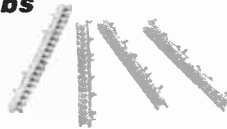


A spool of 30swg copper wire with an 0.005mm coating of self-fluxing polyurethane. Max. voltage 600V DC. Current rating 100mA. Resistance: 0.86Ω per metre at 20°C. Length of wire on spool: 40m.

Order

HY17T (Wire For Wiring Pen) 98p

Wiring Combs



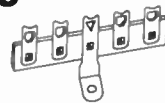
Plug-in wiring combs can be fitted to any circuit board that has 0.04in (1mm) diameter holes on a 0.1in x 0.1in matrix. The combs are fitted to the wiring side of the board between the leads of the integrated circuits. They provide a guide and the pegs control and hold the wire ensuring a neat, stable layout. Sold individually.

Order

FY33L (Comb For Wiring Pen) 10p

TAG STRIPS

5-Way

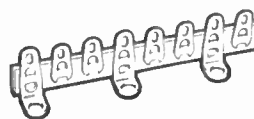


Five tags mounted on a paxolin strip where the middle tag is for screw fixing.

Order

FM34M (5-Way Tagstrip) 10p

13-Way



Thirteen tags mounted on a paxolin strip. Five of the tags are right-angled for mounting.

Order

FL29G (13-Way Tagstrip) 28p

TAG BOARD



Miniature SRBP base with 36 solder tags in two rows. Overall size: 117 x 38 x 7.5mm.

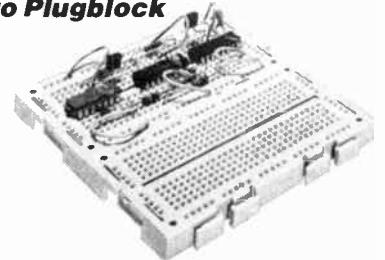
Order

FL11M (Tag Board) 85p

PLUGBLOCK SOLDERLESS BREADBOARDS

A system for constructing circuits in such a way that the components can be used over and over again. Component wires are simply pushed into the boards where they are firmly held by double leaf spring contacts. To modify the circuit simply pull the components out and plug in again in the correct position.

Vero Plugblock



This picture shows two Vero Plugblocks joined together

This plugblock has a total of 360 contacts arranged in two blocks of 29 rows of five interconnected sockets on a 0.1 x 0.1in. matrix and 4 other rows of interconnected sockets arranged around the bus-bars. The distance between edges of the main matrix for use as the two centre rows of sockets is 0.3in., the spacing between the leads on an 8, 14 or 16-pin IC package. Thus the block will hold up to three 16-pin or up to six 8-pin DIL packages for example. Fixing is by self-adhesive foam insulating strip on the base of the block or via the four holes in the corners of the block into which will screw a No.4 self-tapper. The holes are 8BA clear. Boards may be plugged together horizontally and vertically to make larger arrays for more complex circuits. All contact positions are clearly identified in an alpha-numeric grid.

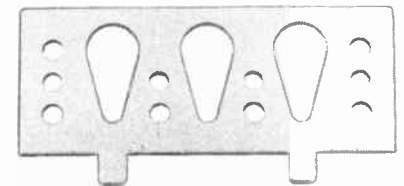
Body material: Glass filled nylon
 Contacts: Copper, nickel, tin alloy
 Accepts wires dia.: 0.5 to 0.8mm
 Dimensions: 91 x 46 x 8mm
 Fixing holes: 81 x 38mm

Order

YL11M (Vero Plugblock) £5.95

Verobloc Accessories

Bracket



A bracket that plugs into the long edge of a Verobloc to permit mounting of potentiometers, switches etc.

Order

HQ84F (Verobloc Bracket) 80p

Design Sheets

A pack of 50 engineers' design sheets for Verobloc.



Order

BK62S (Engineer Design Sht) 98p

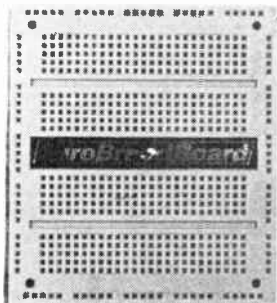
Verobloc Kit

Kit of Vero plugblock, engineers' design sheets and Verobloc bracket.

Order

BK63T (Verobloc Kit) £5.95

Euro Breadboard



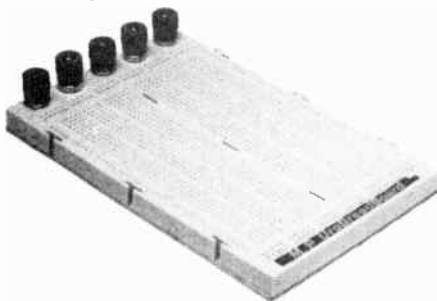
This plugblock has a total of 600 contacts arranged in four blocks of 25 rows of five interconnected sockets on a 0.1 x 0.1 in. matrix and four other rows of 25 interconnected sockets arranged around the edges of the main matrix for use as bus-bars. The distance between the two centre rows of sockets is 0.6 in., the spacing between the leads on a 24, 28 or 40-pin IC and the distance between the centre rows of sockets of both end blocks of contacts is 0.3 in., the spacing between leads on an 8, 14 or 16-pin IC package. Thus the block will hold up to six 14-pin and two 24-pin DIL packages for example. A non-slip rubber backing is fixed to the board and fixing is by four holes in the corners of the block into which will screw a No. 4 self-tapper. The holes are 8BA clear. Horizontal rows are designated 1 to 25 whilst the four matrix blocks are labelled A, B, C and D and the four bus-bar rows are labelled X1, X2, Y1 and Y2.

Contacts: Nickel silver
 Contact resistance: <10mΩ
 Contact rating: 1A
 Contact life: >5000 insertions
 Accepts wire dia: 0.25 to 0.85mm
 Dimensions: 92 x 82 x 10mm
 Fixing holes: 78.5 x 68mm

Order

YR83E (Eurobreadboard) £7.95

Breadboard For Microprocessors



A large version of the Eurobreadboard. In addition this plugblock has 5 large screw terminals -5V, +5V, -12V, +12V and Earth and colour-coded black, red, black, red and green respectively for connection to power supply. The plugblock has a total of 1422 contacts arranged in four blocks of 47 rows of four interconnected sockets, and two blocks of 47 rows of five interconnected sockets on a 0.1 x 0.1 in. matrix and six other rows, four of 30 and two of 40 interconnected sockets arranged around the edges of the main matrix for use as bus-bars. A non-slip rubber backing is fixed to the board. Boards may be clipped together horizontally to form larger arrays and they will clip to the Professional Plugblock (YR84F) and the Bus Strip (YR85G). All contact positions are clearly identified on an alpha-numeric grid.

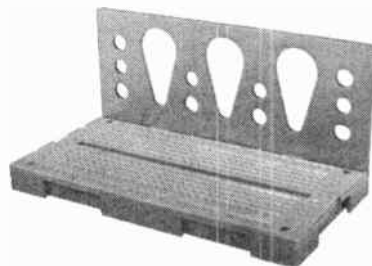
Contacts: Nickel silver
 Contact resistance: <10mΩ
 Contact rating: 1A
 Contact life: >5000 insertions
 Accepts wires dia: 0.25 to 85mm
 Dimensions: 159 x 100 x 21mm

Order

XX42V (MP Urobreadboard) £24.95

Professional Plugblock

This plugblock has a total of 550 contacts arranged in two blocks of 47 rows of five interconnected sockets on a 0.1 x 0.1 in. matrix and two other rows of forty interconnected sockets on either side of the length of the main matrix for use as bus-bars. The distance between the two centre rows of sockets is 0.3 in., the spacing between the leads on an 8, 14 or 16-pin DIL package. Thus the block will hold up to six 14-pin or nine 8-pin DIL packages for example. The rear plastic panel unclips to allow the contact arrangements to be seen and any contact strip to be changed should it ever be damaged. Boards may be clipped together horizontally or vertically to make larger arrays for more complex circuits. All contact positions are clearly identified on an alpha-numeric grid. A component support bracket is supplied with the block. It will fit onto any outside edge or down the centre with cut-outs in the bottom of the bracket allowing it to sit over IC's. The bracket has ten 5mm dia. holes and three tapered holes from 4mm to 12.7mm dia. punched into it, enabling mounting of potentiometers, rotary and toggle switches, lamp-holders, push-button switches and other components normally mounted on panels.

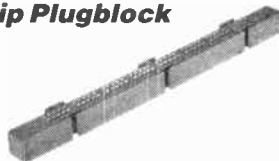


Body material: Thermoplastic polyester
 Temperature range: -50 to +125°C
 Contact resistance: <10mΩ
 Contact rating: 1A
 Contact to contact capacity: 0.5pF
 Contacts: Nickel silver
 Contact life: >5000 insertions
 Accepts wires dia: 0.25 to 0.85mm
 Dimensions: 150 x 50 x 10mm

Order

YR84F (Prof Plugblock) £7.95

Bus-Strip Plugblock



For use with our Professional Plugblock this block clips on to any side to provide additional bus-bars. The block has a total of 80 contacts arranged in two strips of forty interconnected sockets. The rear plastic panel unclips to allow the contact arrangement to be seen and any contact strip to be changed should it ever be damaged. Other details as Professional Plugblock.

Order

YR85G (Bus-Strip Plugblock) £2.95

Contact Strip

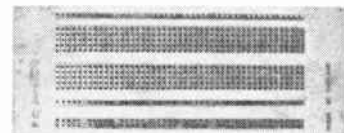
A single strip of five interconnected contacts for replacement in our Professional Plugblock and Bus-Strip Plugblock.



Order

YR86T (Plugblock Contct Strp) 28p

Professional Plugblock PCB



An SRBP circuit board printed and punched in the same layout as our Professional Plugblock with tinned copper strips. When a prototype circuit is working properly it may be transferred lead for lead from the plugblock to the pcb for permanence.

Order

YR87U (Plugblock PCB) £1.98

PCB MAKING EQUIPMENT

'Seno GS' Etching System



The "Seno GS" etching system is a completely safe, clean and extremely simple system for laboratory, school or home use.

System comprises a two section heavy duty polythene sleeve with the etching chemicals sealed in the lower section. A prepared board is placed in the upper compartment and the top of the bag is sealed. The seal between compartments is removed and the etchant flows over the board. A constant visual check on the board is possible while etching is taking place.

When etching is completed the liquid is drained into the lower compartment which is then sealed off again. The top seal is now removed and some water poured in to rinse the board. Now simply remove the perfectly etched board — all without personal contact with the acid.

A special neutraliser is provided so that when etchant is exhausted the neutraliser can be added. These are mixed together in the sealed bag.

Two hours later, the pack is a semi-hard neutral mass ready for disposal straight into the dustbin. Etchant is sufficient for approximately 1600cm² of copper. The complete kit is supplied in an expanded polystyrene storage box which facilitates totally safe storage between applications.

Order

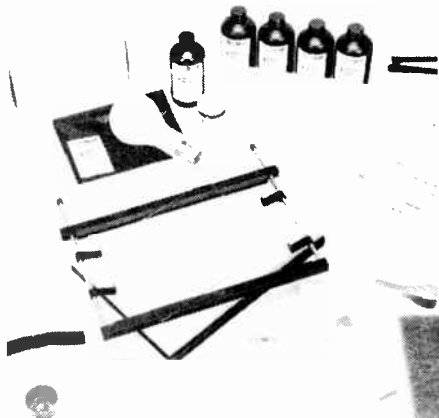
XB43W (Seno Etch System) £7.95

**PHONE NOW
0702 552911**



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Make Your Own PCB's Kit CM100



This kit makes available for the first time all the products needed to make PCB's of a professional standard in quantities suitable for small scale users. The film used in the kit has the advantage that no darkroom is needed; it can be handled quite safely in normal room lighting. Full instructions are included with each kit, and all the items are available separately so that you can top up your kit later.

Contents List

Special autopsitive film
Photoflood bulb
Developer part A
Developer part B
Film fixer
Film clearing solution
3 photographic dishes
Lint-free cloth
2 pairs plastic gloves
Liquid measure
Liquid crystal thermometer
Cotton wool balls
Retouching pen
Film clips
Universal exposure and assembly frame
Photoresist
Applicator holder and foam strip
Photoresist developer concentrate crystals
6 double sided circuit boards
Bag of copper etchant
Scouring pad
Solder flux protective lacquer
2 x 1mm HSS drills
Etchant neutraliser

Order

XG20W (CM100 PCB Kit) £69.95

Replacement Items

Twelve sheets of autopsitive film size 110 x 160mm.

Order

RK40T (Film FPF012) £10.95

Two sheets of autopsitive film size 300 x 400mm.

Order

YJ43W (Film 300 x 400) £10.95

Copper etchant (including rods and clamps) and neutraliser.

Order

RK41U (Etching Kit CM100E) £4.95

Copper clad, double sided PCB boards, pack of six. Size 100 x 160mm.

Order

RK42V (PCB006 Pack) £7.95

Chemicals kit comprising photoresist, photoresist developer, flux lacquer, fixer, developer A, developer B, clearing solution, and foam strip.

Order

XG21X (Chemicals Kit CM100C) £15.95

Individual items in the chemicals kit can be supplied separately, as follows:-

Positive photoresist only.

Order

YJ37S (Pos Photoresist) £2.95

Photoresist developer only.

Order

YJ38R (Photoresist Developr) £1.98

Developer A only.

Order

YJ39N (Developer FDA) £3.95

Developer B only.

Order

YJ40T (Developer FDB) £3.95

Film fixer only.

Order

YJ41U (Film Fixer) £1.95

Film clearing solution only.

Order

YJ42V (Film Clear Solution) 98p

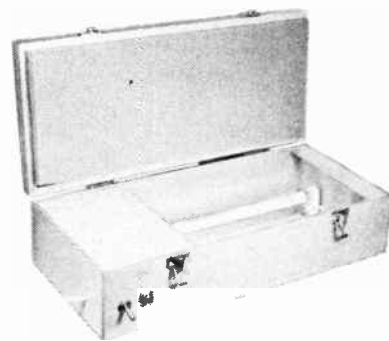
UV Photo-Etch System

The UV photo-etch system of making pcbs has many advantages over any other system for prototypes or production in very small quantities.

1. The original artwork can be produced using a professional method, because it does not have to be made on the pcb.
2. The production run can be made from the same artwork as the prototype is not destroyed during the etching process.
3. Alterations can be made without having to remake the whole artwork.
4. The artwork may be filed and additional copies of the original pcb made at any time.
5. Magazine artworks could be turned into a positive transparency by a professional photographer at very little cost, saving hours of time making new artwork.
6. The system is very simple to use and does not require a darkroom. Full instructions are supplied with the ultra-violet light exposure unit.

Ultra-Violet Light Exposure Unit

An attractive metal case finished in grey and containing two 8W ultra-violet tubes. Case size 406 x 177 x 102mm. The lamps are covered by a 4mm glass sheet masked to give a maximum exposure area of 254 x 157mm. The metal lid is hinged and clips down firmly at the front. A pressure pad fixed to the lid ensures an even and firm pressure on the pcb to keep it in good contact with the glass over the whole exposure area. The box incorporates a mains switch and indicator and is connected to the mains (240V AC) via mains lead supplied. The unit must be used with our Photo-etch board and after exposure the board must be developed using sodium



hydroxide solution (caustic soda) available from most chemists (e.g. Boots) before etching in ferric chloride in the normal way. Full instructions for use are supplied with the exposure unit.

Order

XY10L (UV Exposure Box) £49.95

Replacement UV Tubes

Spare tubes are available should replacements be required.

Order

FJ55K (Spare UV Tube Exp Bx) £5.95

Pre-Sensitised Copper-Clad Boards

NEW

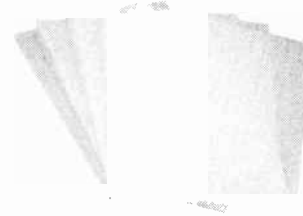
Single and double-sided copper-clad glass-fibre boards coated with a positive photo-resist suitable for use with our UV exposure box. The boards are supplied in a light-safe polythene bag, and should be kept in the bag until required for use. The PCB should be exposed using our UV exposure box and a circuit overlay transparency. Exposure time will be 8-15 mins. Mix together 1 pint of cold water and 1 teaspoon of sodium hydroxide (available from most chemists) and pour into a tray. Gently rock the exposed PCB in the tray until the unwanted coating is removed. Etch the PCB in a bath of Ferric Chloride. Expose the PCB in the UV box for a further 10 mins. then wash all remaining etch resist in the tray of sodium hydroxide solution.

Three sizes are available in single or double-sided: 75 x 100mm; 100 x 160mm; and 210 x 300mm.

Order

FA60Q (PhotoEtch Smll Singl) £1.45
FA61R (PhotoEtch Smll Doubl) £1.95
BW19V (PhotoEtch Med Single) £2.95
FA62S (PhotoEtch Med Double) £3.95
FA63T (PhotoEtch Lrg Single) £9.95
FA64U (PhotoEtch Lrg Double) £11.95

Drafting Film Pack



A pack containing 5 sheets of polyester drafting film and one sheet of 0.1 x 0.1in (2.54mm) grid. Lay one sheet of film on the grid which then assists in exact placing of the tracks and pads that make up the artwork. The piece of film with artwork on it is then placed on the UV exposure unit with the coppered photoresist board on top of it and the lid closed. The artwork may be altered or re-used whenever required. Sheet size: 248 x 150mm.

Order

BW20W (Phot-Etch Drtng Pk) £1.98

Positive Photoresist Aerosol Spray

NEW

A 75g aerosol can of positive photoresist for coating copper-clad board. To use, first use a fine grade emery cloth or polishing block to remove dust, dirt, grease, fingermarks and oxide from the copper surface. Rinse well and dry thoroughly. The coating must be applied in subdued light. Shake the can, place the board horizontally in a dust-free area, then holding the can at a 30° to 45° angle, from a distance of 20 to 30cm spray with smooth strokes in a zig-zag pattern. Leave in low light for 5 minutes until touch-dry. Move to a dark well-ventilated area and leave for 24 hours (or heat to 80°C for 15 minutes, but do NOT use an open flame or incandescent element). The board may now be used in the normal way, with our UV Light Box.



Order
YJ98G (Pos Photores Spray) £2.25

Clear Protective Lacquer

A transparent plastic coating which can be used to protect printed circuit boards and sensitive electronic circuitry from the effects of humidity and corrosion. Ideal for sealing EHT and high voltage conductors, and can be used for additionally insulating automotive HT circuits against the weather, for example. Does not crack or discolour, conforms to international specifications. Disappears quickly and easily on the application of a soldering iron, hence the circuit is not difficult to service or modify afterwards. Supplied in a 250gm aerosol can.



Order
YB75S (PCB Lacquer) £1.95

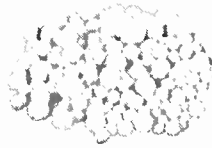
PCB Cleaner

An aerosol solvent especially for removing contaminants and oxidation from printed circuit board conductors, and removing flux residues that result from soldering operations. Before using on plastics, test a small area first. Supplied in 300gm aerosol can.



Order
YJ45Y (PCB Cleaner Aerosol) £1.48

ETCHING AIDS Ferric Chloride Crystals



A pack of Ferric Chloride (FeCl₃) crystals for etching copper clad boards. Packet contains sufficient crystals to make one pint of solution. Dissolve in cold water. Store and etch in plastic or glass vessels. With regular stirring, etching will take about 20 minutes or longer depending on how many times solution has been used before. One pint will etch about 350 square inches (0.226 square metres).

Order
XX12N (Etch Crystals) £1.98

Etching Fluid



A plastic bottle containing 250cc of high concentration ferric chloride etching fluid. The fluid should be diluted with 250cc of water before use (i.e. one part etchant, one part water).

Order
WF10L (Etcher Fluid) £1.98

Printed Circuit Board Etch Resist Marker Pen

STAR BUY



A nylon tipped pen for fast fabrication of perfect printed circuit boards. The ink adheres perfectly to copper and is completely resistant to ferric chloride and other usual etchant solutions. Draw the planned circuit onto a thoroughly cleaned copper laminated board and allow to dry. Then immerse the board in etching fluid until the copper is dissolved. The ink can then be removed with De-greasing Solvent or PCB Cleaner, and the circuit board is then ready to be drilled and assembled. This pen is capable of producing thin, delicate lines allowing for quite a condensed track layout if required. It can also be used as an indelible marker felt tip pen for an enormous range of materials especially metals.

Order
HX02C (PCB Pen) 80p

Etch Resist Remover

A cloth made damp with remover will dissolve Etch Pen ink after etching and leave copper tracks clean. Bottle contains 30cc.



Order
HX03D (Resist Remover) £1.40

Polishing Block



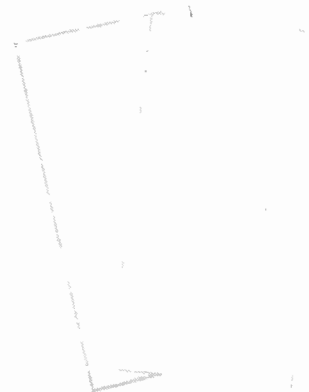
Block is ultrafine non-metallic polishing compound bonded in an elastic material which wears evenly. It cleans, degreases and polishes in one clean simple procedure, totally eliminating the need for abrasive pastes, water washes and solvent washes. It has been designed primarily for cleaning copper-clad boards prior to application of resist inks, or finished circuits prior to tin/silver/gold plating. It is equally useful for cleaning contacts, switch gears, potentiometers, connectors, adjustable transformers etc. Supplied individually.

Order
HX04E (Polish Block) £1.50

Copper-Clad Boards

NEW

A range of copper-clad boards suitable for making your own printed-circuit boards.



The following types and sizes are available:

Single-sided SRBP:
203 x 102mm (8 x 4in) (Small single)
254 x 152mm (10 x 6in) (Medium single)
305 x 203mm (12 x 8in) (Large single)

Double-sided SRBP:
203 x 102mm (8 x 4in) (Small double)
254 x 152mm (10 x 6in) (Medium double)
305 x 203mm (12 x 8in) (Large double)

Single-sided Fibre Glass:
203 x 102mm (8 x 4in) (Small single)
254 x 152mm (10 x 6in) (Medium single)
305 x 203mm (12 x 8in) (Large single)

Double-sided Fibre Glass:
203 x 102mm (8 x 4in) (Small double)
254 x 152mm (10 x 6in) (Medium double)
305 x 203mm (12 x 8in) (Large double)

Order

HX00A (PCB SRBP Smll Single)	50p
WF38R (PCB SRBP Med Single)	98p
WF39N (PCB SRBP Lrg Single)	£1.98
FA55K (PCB SRBP Small Doubl)	65p
FA56L (PCB SRBP Med Doubl)	£1.30
FA57M (PCB SRBP Lrg Doubl)	£1.95
HX01B (PCB F.Glass Sm Sngl)	98p
WF40T (PCB F.Glass Med Sngl)	£1.98
WF41U (PCB F.Glass Lrg Sngl)	£2.95
FA58N (PCB F.Glass Smll Dbl)	95p
WF42V (PCB F.Glass Med Dble)	£1.95
FA59P (PCB F.Glass Lrg Dbl)	£2.95

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ETCH RESIST DRAFTING AIDS

A range of professional etch resist drafting aids for use directly on the pcb or in making 1:1 artwork for use with photo resist pcb's or 2:1 artwork for masters for professional pcb manufacturers.

Black Tapes

A black crepe tape with a matt finish for high quality photographic reproduction. The crepe tape can be made into tight curves without distortion at the edges. A good adhesion is obtained even on irregular surfaces. Tapes are on 16.46m rolls.

The following types are available.

0.031 in.		0.040 in.	
0.062 in.		0.080 in.	
0.125 in.		0.150 in.	
	0.050 in.		
	0.100 in.		
	0.200 in.		

Order

BW21X (Track Tape 31)	£1.50
BW22Y (Track Tape 40)	£1.50
BW23A (Track Tape 50)	£1.50
BW24B (Track Tape 62)	£1.95
BW25C (Track Tape 80)	£1.95
BW26D (Track Tape 100)	£1.95
BW27E (Track Tape 125)	£2.95
BW28F (Track Tape 150)	£2.95
BW29G (Track Tape 200)	£2.95

Black Circles

Die-cut circles manufactured in black crepe and supplied in the form of a roll with half of each symbol stuck to a clear carrier tape. To apply, separate the circles from the carrier, release the film from its protective backing paper and position carrier with circle on the artwork or pcb. Then having applied pressure to the circle, gently pull away the carrier film at an angle leaving the circle securely in position. This method is undoubtedly the most simple, accurate and speedy way to make pcb artwork.

Circles are supplied in rolls of 250 circles.

The following sizes are available.

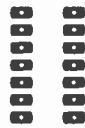
Outside dia. (in)	Inside dia. (in)	Outside dia. (in)	Inside dia. (in)
0.075	0.02	0.25	0.05
0.100	0.03	0.3	0.05
0.125	0.03	0.4	0.08
0.15	0.04	0.5	0.10
0.2	0.04	0.6	0.10

Order

BW30H (Pad 075)	£1.98
BW31J (Pad 100)	£1.98
BW32K (Pad 125)	£1.98
BW33L (Pad 150)	£1.98
BW34M (Pad 200)	£1.98
FJ57M (Pad 250)	£2.50
BW35Q (Pad 300)	£2.95
BW36P (Pad 400)	£2.95
BW37S (Pad 500)	£4.95
BW38R (Pad 600)	£5.95

Dual-In-Line IC Clusters

Sixteen circles arranged in a 0.1 x 0.3in pitch (1:1) or a 0.2 by 0.6in pitch (2:1), to suit IC's up to 16-pin DIL. Symbols can be laid end to end and/or split to make them wider to suit any size IC package.



These pads offer a considerable time saving over using individual pads. Supplied in rolls of 100 16-pin DIL grouped symbols.

Order

BW39N (IC Pads 100)	£6.95
BW40T (IC Pads 200)	£6.95

Drafting Template

A clear plastic template to speed the job of placing pads for pcb artworks. Holes are laid out over the template in various patterns and pitches; simply lay the template over the artwork or pcb, put a pin through the appropriate holes to lightly mark the position, remove the template and put the pads down centred on the marks. The following patterns are marked on the template. DIL packages up to 40-pin at 0.3in and 0.6in. pitch as applicable, TO5, TO18 and TO3 transistor packages including fixing holes for TO3, 8-pin, 10-pin and 12-pin round IC packages. In addition there are a series of precision holes to check drill sizes between 0.6mm and 2mm where drills are often too small to be marked on the shank. Manufactured in clear plastic. Overall size: 64 x 51mm.

Order

BW41U (Drafting Template)	£1.40
---------------------------	-------

PCB Transfers

A range of rub-down black symbols suitable for making printed circuit boards. Available as individual sheets or one of each in a starter kit of thirteen sheets. All symbols are acid resistant.

How to use

Rub down the printed circuit board with Polish Block or fine abrasive paper to give a good finish to the copper surface. Do not use liquid cleaners or water and keep the board dry and clean whilst you are working. Mask the unwanted symbols on the transfer card being used, with the release paper backing, or cut out the required symbol place in position on the printed circuit board (tacky side down), then rub the reverse side of the symbol with a ball pen or soft pencil lead. Lift off the clear film and smooth over by rubbing the release paper over the symbol to make sure there is no lift at the edges. The printed circuit board may now be etched to remove the unwanted copper. When complete, wash under water and rub the transfer away with Polish Block, fine wire wool or scouring powder. You will then have a professional looking printed circuit board, ready to drill and assemble.

Sheet details

Sheet 1	A selection of symbols from sheets 3 to 10.
Sheet 2	Straight lines. 20 lines 143 x 1.25mm.
Sheet 3	Pads. 260 circles with open centre. Outside diameter 2.4mm; inside 0.4mm.
Sheet 4	Fish plate connectors and T's. 36 T connectors; 54 two-hole fishplates; 54 three-hole in-line fishplates; 26 three hole triangular pads.
Sheet 5	Transistor pads. All pads are the same size as sheet 3. Contains 52 pads; 39 three-lead transistor pads; 26 four-lead transistor pads.
Sheet 6	Dual-in-line IC pads. Contains 18 rows of 37 pads spaced 0.3 x 0.1in.
Sheet 7	90° and 130° bends. Line thickness 1.25mm. 93 various sized 90° bends; 69 various sized 130° bends.
Sheet 8	TO5-can IC's. 18 for 8-lead IC's. 18 for 10-lead IC's and 18 for 12-lead IC's.

Sheet 9	0.15in spaced edge connectors. 8 rows of 38 tongues.
Sheet 10	0.1in spaced edge connectors. 8 rows of 54 tongues.
Sheet 11	Straight lines. 24 lines 142 x 0.5mm.
Sheet 12	90° and 130° bends. Line thickness 0.5mm. 384 various sized 90° bends; 288 various sized 130° bends.
Sheet 13	Dual-in-line IC pads with leads and offset holes. 4 rows of 37 pairs of pads/leadouts.
Kit	A kit containing thirteen sheets, one each of the above.

Sheet 2	Sheet 3
Sheet 4	Sheet 5
Sheet 6	Sheet 7
Sheet 8	Sheet 9
Sheet 10	Sheet 11
Sheet 12	Sheet 13
Order	
HX45Y (Transfer Sheet 1)	48p
HX46A (Transfer Sheet 2)	48p
HX47B (Transfer Sheet 3)	48p
HX48C (Transfer Sheet 4)	48p
HX49D (Transfer Sheet 5)	48p
HX63T (Transfer Sheet 6)	48p
HX64U (Transfer Sheet 7)	48p
HX65V (Transfer Sheet 8)	48p
HX66W (Transfer Sheet 9)	48p
HX67X (Transfer Sheet 10)	48p
HX68Y (Transfer Sheet 11)	48p
HX83E (Transfer Sheet 12)	48p
HX84F (Transfer Sheet 13)	48p
HX44X (Transfer Kit)	£3.95



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<i>Audio Oscillator</i>	258	<i>Hexadrum</i>	254	<i>Remote Control For Amp</i>	240
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HOW TO SOLDER

Over 95% of the projects returned to our service department because their builder cannot get them to work are found to be faulty due to poor soldering. Therefore the following will we hope help to alleviate this problem. Good soldering is an art that has to be learned — and the only way to learn is by practising, not on the kit you've just bought, but on some spare wire and a piece of old circuit board or small piece of Veroboard. The iron must be correctly connected to the power supply before use. The circuit to which it is connected should provide adequate protection for the operator in the event of a fault occurring, or, for example, as a result of damage due to dropping the iron. This protection is usually provided by the fuse. Surplus solder should be wiped from the tip of the iron. Do not shake the iron free of solder. This action is not only dangerous to the operator but may damage the work being soldered and/or the soldering iron. The iron should never be knocked on the bench in order to remove surplus solder. This will inevitably cause damage to the iron and may result in serious burns or shock to the operator. Before the soldering iron can be used, the tip of the bit must be tinned and this operation is best carried out using resin cored solder. It is essential to tin the tip before the oxidation temperature of the bit material is reached. To ensure this, apply the solder to the tip immediately the iron is switched on and, as the solder melts, wipe it over the whole surface of the tip. Some surplus solder will remain, this can be removed carefully with a dampened wiping pad. The iron should then be used immediately — prolonged heating of the bit may result in the solder forming a film of oxide which will impair the strength of the solder joint. Before the iron is left id'e, some surplus solder should be applied to the tip to prevent oxidation of the basic metal of the tip. If the iron is not to be used for a considerable time, it should be switched off. Modern irons heat up quickly, so little time will be wasted in taking this precaution. When the iron is heated up and the tip properly tinned, it is ready for use. All miniature and sub-miniature irons are intended to be held as one would hold a pencil,

between the fingers and thumb, with the handle projecting between the first finger and thumb and the connecting lead resting over the wrist. When soldering a joint, first apply a small amount of fluxed solder to the tip of the bit. This will ensure a better heat transfer to the joint since the interface will be a molten solder which can cover a greater surface area. Place the tip on the joint and keep it in contact until the joint reaches the melting point of the solder, then apply sufficient solder to the joint (not the tip!) such that the whole joint is embraced by solder. Leave the tip in contact with the joint to ensure complete solder flow around the joint. A joint that is dirty or heavily oxidised cannot be soldered with normal resin-cored solder; it is therefore essential, before attempting to solder a joint, to see that it is clean. It is common practice to pre-tin all components and wires before assembling them ready for jointing. An excessive amount of solder should not be applied, either to the tip or the joint. It is difficult to remove surplus solder from a joint, and excessive application of solder to the tip causes premature tip wear. Inexperienced operators usually use far too much solder which results in excessive costs and premature erosion of the tip of the bit. Also, more often than not, they apply the solder to the tip instead of the joint, usually well before the joint has reached the required temperature. Special problems arise when soldering circuits involving joints near transistors because these delicate components are easily damaged by the application of too much heat to the connecting wires. This is overcome by using a heat shunt, clipped onto the wire between the joint and the transistor. It is necessary to solder the joint as quickly as possible, and it is therefore essential that the tip of the bit is hot enough to melt the solder quickly and that the wires to be jointed are cleaned and preferably pre-tinned. The wiring in transistor circuits should always be earthed correctly and the circuit board disconnected from any test gear and power supplies, otherwise an earth loop may be created when the bit is applied to the joint, creating a potential difference across the electrodes of a transistor in excess of its maximum current rating.

HOME SECURITY SYSTEM

Features:

- ★ Six independent channels with two groups per channel
- ★ Two or four wire operation with line sensing of open or short circuit or resistance change (jumping)
- ★ Tamper-proof main cabinet
- ★ External horn loop control has its own open/short circuit and jumping protection
- ★ Presettable entry and exit delay timers

A home security system offering a high degree of protection for domestic or commercial premises coupled with excellent long-term reliability. The unit is mains operated, but will run off its small internal nickel-cadmium rechargeable battery pack for 2 to 3 days depending on the size of the system. The internal battery is continuously charged when the mains is present and changeover from mains to battery and vice-versa has no effect on the system. CMOS circuitry is used throughout to minimise current drain. There are sockets for six separate plug-in channels so that for example all downstairs windows could be connected to one input, all downstairs doors to another, all upstairs windows to another and perhaps shed and garage doors and windows to another. When setting the system you know immediately where to look for the window left open accidentally if the system will not set. Or parts of the system only may be set. For example, during the late evenings, the shed and garage circuit only may be set. Whatever your requirements this system offers the fullest possible flexibility for complete security. The external horn is also fully protected when fitted with dry batteries. Its prominent position alone will deter most burglars, but any attempt to tamper with it will set it off. If the wires are cut or tampered with, the horn will sound. Even ripping the box off the wall will not stop the alarm. The recommended dry batteries will sound the alarm at full power for at least four hours even if the wires are cut. The alarm is extremely easy to build, with internal wiring kept to an absolute minimum. Operation is by single keyswitch and exit and entry delays may be preset to suit your requirements. There is an LED for each channel giving monitoring facilities and an internal sounder giving 'alarm condition' tones. Even the main cabinet is protected by a microswitch fitted to the PSU pcb.

The following parts used in this project are not described elsewhere in this catalogue.

Burglar Alarm Box

A steel box with hinged front door, punched and printed in white. Finished in a grey stove-enamel.

Order

XG06G (Burglar Alarm Box) £10.95

External Horn Box

A hard-wearing steel box finished in grey with a louvred front and sloping top for external mounting.

Order

XG07H (Ext Horn Box) £14.95

Printed Circuit Boards

Order

GA44X (Burglar Alarm PSU PCB) £2.35
GA45Y (Burglar Alarm Main PCB) £7.95
GA46A (Break Contact PCB) £1.95
GA47B (Ext Horn PCB) £1.50

PROGRAMMABLE TIMER FOR EXTERNAL HORN

- ★ For use with Maplin's Home Security System
- ★ Direct replacement for previous Horn PCB
- ★ 3 timing settings from 2 minutes to 2½ hours
- ★ Automatic switch-over to flashing beacon when sounder time is up
- ★ Two wire control with anti-tamper protection

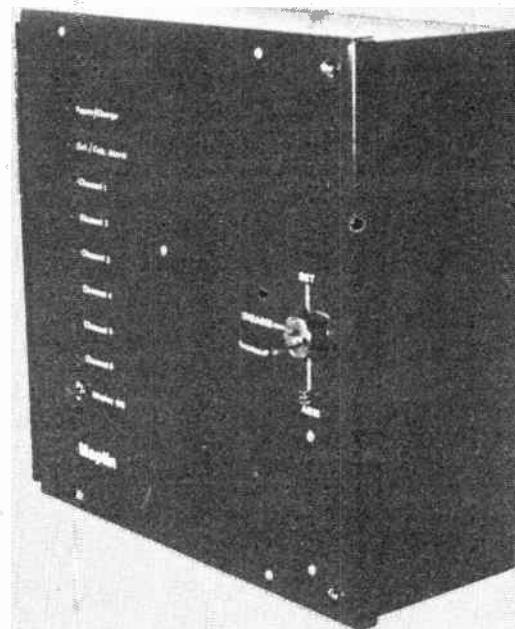
New recommendations applying to the sounding of horns and sirens on burglar alarms for prolonged periods have inspired this up-dated design of Maplin's audible warning device — possibly to the relief of your neighbours!! This direct replacement, will time the duration of the audible alarm and will, after the siren ceases continue to flash a beacon lamp to attract further attention. The single pcb is easy to construct, and fits into the same cabinet as the former, original pcb.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA69A (Programmable Timer PCB) £1.95



Burglar Alarm Kit

A complete kit is available which includes all the parts in the PSU parts list including standby power parts, and all the parts in the main parts list excluding those listed under the heading 'As required'.

Order

LW57M (Burglar Alarm Kit) £49.95

Break Contact Module Kit

A complete kit of all the parts for this module is available.

Order

LW59P (Break Contact Kit) £2.95

External Horn Kit

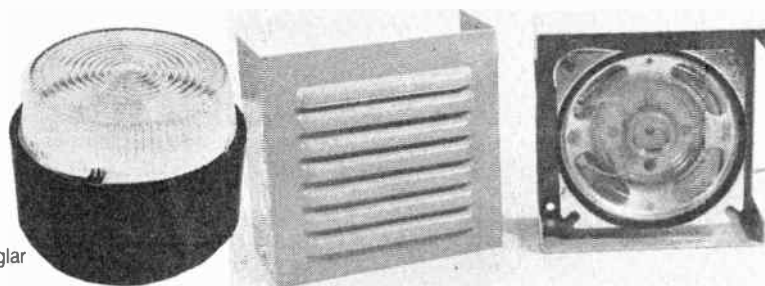
A complete kit of all the parts required except the batteries.

Order

LW58N (Ext Horn Kit) £39.95

Construction Details

Full construction details may be found in the Maplin Projects Book 2. See inside back cover of this catalogue.



Kit

A kit of parts is available to make this pcb but does not include the Beacon which must be ordered separately. See page 198.

Order

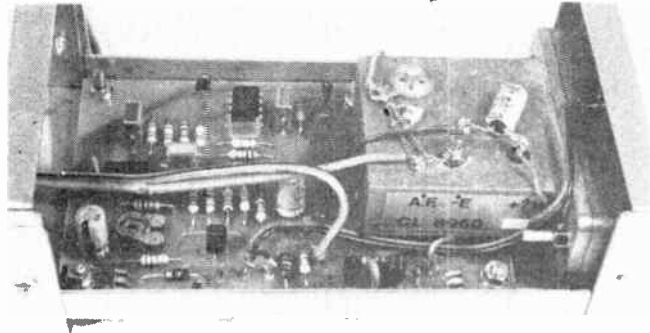
LW98G (Programmable Timer Kit) £7.95

Construction Details

Full construction details may be found in the Maplin Project Book 5. See inside back cover of this catalogue.

RTX3 RADAR DOPPLER INTRUDER DETECTOR

- ★ Home office type-approved microwave Doppler detection system with up to 20m range
- ★ Single unit covers a wide area
- ★ Not susceptible to instability or interference from sound or light
- ★ Complete unit 133 x 70 x 38mm box can be placed anywhere in area to be scanned
- ★ Unit may be hidden behind thin card or plastic



The Maplin RTX3 movement detector utilises a specially manufactured microwave transceiver module, the CL8960. The module is assembled and preset to transmit at the required legal frequency of 10.687GHz \pm 12MHz (10,687,000,000Hz) with a peak transmission power of 10mW. The extremely small wavelength (2.8cm) makes a very sensitive movement detector with coverage of quite a large area. In this design the range is adjustable from about 2m to 20m and the edge of the range is fairly well-defined wherever it is set. The unit when triggered operates an internal LED and switches on a transistor which could switch up to 15V at 1A but does not latch. Normally the unit will be used with our controller unit. This unit provides a power supply for up to four radar modules and an interface for one radar module. Additional 'extra channel' pcb's can simply be wired on to the side of the main pcb. Thus each interface module could be wired via a standard Break Contact Module to individual channels on the Home Security System (described in Maplin Project Book Number 2) so that after triggering the actual unit that fired would be indicated. Alternatively if that facility is not required then simply connect the relays in series and connect them to just one channel on the Home Security System. The module provides the facility to connect a standby battery pack. Twelve nickel cadmium batteries are required and they are trickle-charged all the time mains is present. When mains fails, the batteries take over without triggering the alarm. The size of battery used will depend on how many radar units are being used and how long you wish standby to last after mains fails.

The current drain from the battery for each radar module is 170mA. Thus with 12 fully charged 'C' cells (1800mAh types), four modules would run for about three hours and a single module for about 12 hours. Alternatively, a single module would run from 12 'AA' cells (500mAh) for about three hours. If standby batteries are not used then although when mains fails the radar units cease to function and the alarm is not triggered, when mains returns, the radar units, in taking a few seconds to settle, will trigger the alarm. So it is a considerable advantage to have standby batteries and avoid this kind of false triggering. This unit could be used with any alarm system, but note that the relay contact does not latch. The maximum contact rating is 1A at 24V DC.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Order

GA81C (Channel/PSU PCB)	£1.50
GA82D (Extra Channel PCB)	98p

RTX3 Doppler Module Kit

A complete kit is available to build the RTX3 including a pcb and an application form for the required Home Office licence. Note that the pcb is not available separately as the project is only licensable if built from the kit.

Order

LW73Q (RTX3 Doppler Kit)	£44.95
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Radar Channel/PSU Module Kit

A complete kit of all the parts you need except Mains cable and Thermpath.

Order

LW74R (Radar Ch/PSU Module)	£15.95
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Radar Extra Channel Module Kit

A complete kit of all the parts required except Thermpath.

Order

LW75S (Radar Extr Ch Module)	£4.45
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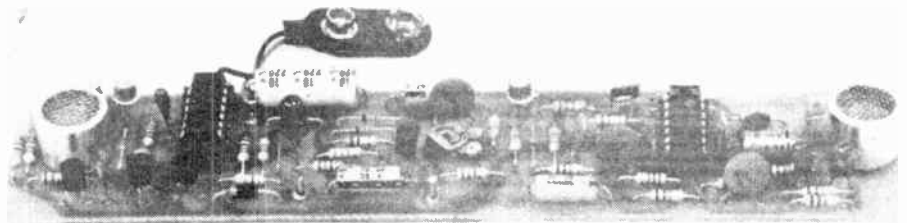
Construction Details

Full construction details may be found in the Maplin Projects Book 3. See inside back cover of this catalogue.

ULTRASONIC INTRUDER DETECTOR

★Features:

- ★ Range up to 20 feet (400 sq ft)
- ★ Adjustable sensitivity
- ★ Direct connection to the Maplin Home Security System via our ultrasonic interface plug-in module
- ★ Single PCB construction with no setting up required
- ★ Up to three may be used on any Maplin Home Security System



The ultrasonic intruder detector is a worthwhile addition to your Maplin Home Security System. It will function over a much wider area than conventional switch contacts, it is highly portable, can be used almost anywhere, and can offer total security of a fairly large room.

The ultrasonic detector works on the Doppler Effect Principle, which in this case means transmission of a 40kHz carrier signal, and reception of the fundamental carrier along with additional frequency-shifted signals.

These extra signals can vary in frequency by up to 200Hz either side of the fundamental, and are quite small in amplitude. Several stages of filtering are required to remove the carrier, spurious r.f. and mains interference.

The remaining signals are amplified, and if they are sufficiently large, the alarm will be triggered. In this design the transmitter and receiver are both mounted on the same PCB along with their associated circuitry, and signals are 'bounced' around the room.

As an improvement over conventional systems, in which the oscillator may require many tedious hours of alignment, we have designed a system in which the transducer determines the oscillator frequency i.e. the circuit needs NO setting up at all.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Order

GB00A (Ultrasonic Xvr PCB)	£1.95
GB01B (Ultrasonic IF PCB)	£1.95

Ultrasonic Transceiver Kit

A complete kit of everything you need.

Order

LW83E (Usonic Xceiver Kit)	£10.95
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Ultrasonic Interface Kit

A complete kit of everything you need to build this project.

Order

LW84F (Usonic Interface Kit)	£2.95
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Construction Details

Full construction details may be found in the Maplin Projects Book 4. See inside back cover of this catalogue.

INFRA-RED MOVEMENT DETECTOR

An intruder detector using the pyro-electric principle as an infra-red movement detector. Unlike other infra-red intruder systems there is no transmitter; the movement detector reacts to heat transmitted by objects within its range, and can detect a warm body at a distance of up to 10 metres. Similarly it would operate as a fire alarm at the same time. The Movement Detector will interface with the Maplin Security System, and has added protection against tampering.

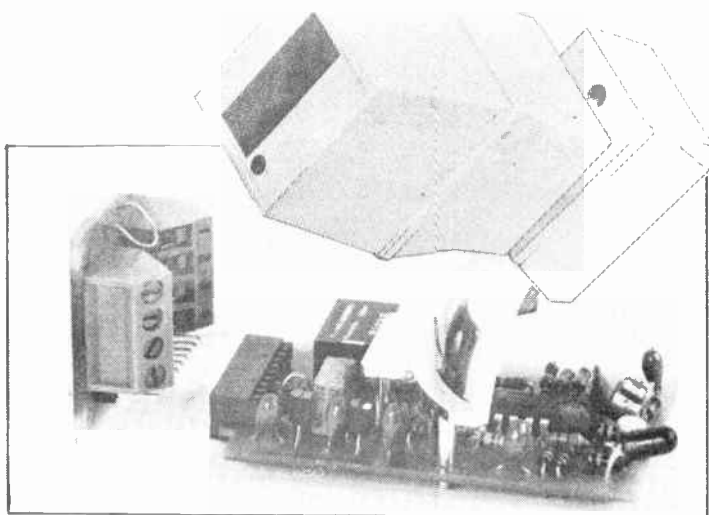
Anything warm transmits on the infra-red wavelength, and in the movement detector these transmissions are reflected and focused by a parabolic mirror onto a solid state, pyro-electric detector that is very sensitive; a control is provided whereby the sensitivity can be adjusted. Recommended positioning of the module would be 2 metres above ground level, where the area covered would extend out from the detector at 45 degree angles on either side, to range approximately 8 metres distant. Greatest sensitivity is achieved on a line on axis with the module up to a distance of 10-12 metres. The module may be chosen to respond immediately to a signal, or an accumulation of signals requiring a body to pass completely through the area covered before detection. Output is by switched relay contacts to operate alarm etc., but note that this relay has a break action when the detector is triggered and is normally closed. Operates from 12V supply.

Available only as a complete kit of parts.

Kit

Order

LK33L (Infra Red Mvmnt Dctr) £34.95



Construction Details

Full details of construction may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

AUTOMATIC FLOODLIGHT CONTROLLER

- ★ Interfaces with other Security Systems
- ★ Adjustable Time Delay ★ Switches up to 1kW
- ★ Manual or Automatic Control ★ Local Alarm Indication
- ★ Recorded Alarm ★ Lamp Failure Indication

Used in conjunction with our Infra-red Detector Kit, this unit provides intruder activated mains power switching for powerful flood lamps, sirens, etc. It was primarily designed as a security device in its own right, although provision has been made for it to be linked into a larger security system. This controller also has other applications where it is required to switch on a mains-powered device for a preset period of time after which it will automatically switch off until re-triggered. The controller was intended to be triggered by the Infra-red Movement Detector (kit LK33L), although it could be operated from any make or break detection device. The controller supplies the infra-red detector with 12V DC, and the detector's internal relay trips the alarm part of the controller. The controller output is in the form of the 240V AC mains for mains powered appliances. The on time duration is adjustable from 20 seconds to 4 minutes, and a latch signals that the alarm has been tripped until the controller is reset.

A buzzer will sound for the duration of the floodlight on time, and provision is made for a latched output for a low current alarm bell for example which will ring continuously until the controller is reset.

The following is not shown anywhere else in this catalogue.

Printed Circuit Board

Order

GB94C (Floodlight Alarm PCB) £4.95



NEW

Kit

A complete kit of all parts is available.

Order

LK73Q (Floodlight Alarm Kit) £28.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 16. See inside back cover of this catalogue.

PANIC BUTTON

- ★ For use with Maplin Home Security System
- ★ Will trigger External Horn even if system is disarmed
- ★ Can be reset with existing Alarm Unit Keyswitch

The single pcb caters for up to four push buttons, which can be placed close to back or front door or beside the bed for example. In the event of an emergency, pressing the button will trigger the alarm, thus attracting attention and disuading potential attackers, burglars etc. The system is reset from the master re-set keyswitch.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA16S (Panic Button PCB) 98p

Kit

A complete kit of parts is available for this project.

Order

LW97F (Panic Button Kit) £3.95



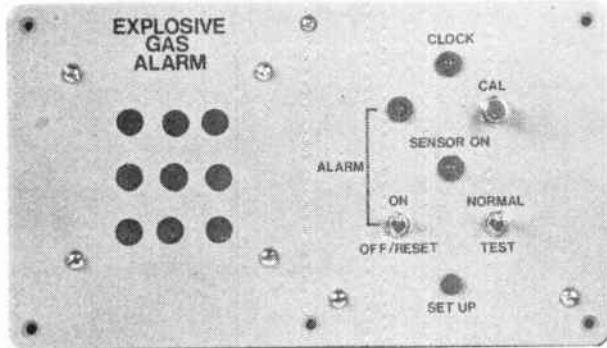
Construction Details

Full construction details may be found in Maplin Project Book 5. See inside back cover of this catalogue.

EXPLOSIVE GAS ALARM

- ★ Operates from 12V battery
- ★ Very low average current consumption
- ★ Detects all common explosive or inflammable gasses
- ★ Loud strident alarm

NEW



Dangerous gas leaks, particularly in confined spaces, causing explosions and fires, are becoming a more common occurrence, usually damaging property and often maiming or even killing people. The Maplin Gas Detector has been designed to prevent the build-up of these gases by sounding a loud alarm before sufficient gas has leaked to cause a damaging explosion. The sensor used consists of two separate units, the sensor itself and a reference compensator. The system will detect all common explosive or inflammable gases such as Butane, Propane, Methane, Town Gas, Natural Gas, and Petrol Vapour. The

sensors are enclosed in double wire mesh housings to prevent any chance of the sensor itself igniting any gases encountered. Ideal for caravans and boats. Runs from 12V battery, and to conserve power, the air is tested for gas approximately every 5 or 6 seconds.

The following are not shown elsewhere in this catalogue.

Gas Sensor

Order

FM87U (Gas Detector Sensor) £6.95

Printed Circuit Boards

Order

GB69A (Gas Detector PCB) £2.45
GB79L (Gas Alarm Sensor PCB) £1.15

Kit

A complete kit of parts excluding case, control knob and hardware is available for this project.

Order

LK60Q (Explosive Gas Alarm Kit) £23.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 13. See inside back cover of this catalogue.

CODE LOCK

- ★ Will Work With Maplin Home Security System
- ★ Wide Range Of Applications
- ★ Fully Programmable

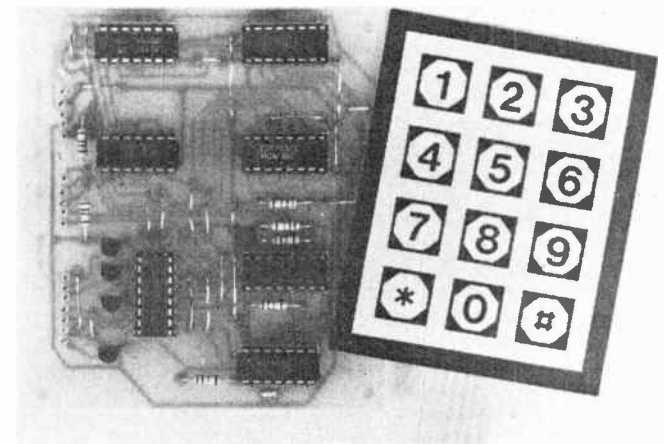
Security is the key to this versatile electronic lock. The Maplin Code Lock provides a convenient means to install and operate almost foolproof electronic locks. It completely eliminates the need for dummy switches etc. intended to fool unauthorised persons. By utilising a code known only to the owner, associated circuitry can be disabled by entering the code on an appropriate keyboard. As the system is fully programmable any code changes necessitated from discovery of the current code by unauthorised persons can quickly and easily be initiated via the units "read/write" switch. Simple operation is facilitated by the keyboard's push-button telephone-type style. Applications for this project are numerous as the Code Lock can operate relays or triacs to control commercial electric doors etc. The device can also be used with Maplin's Home Security System.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB25C (Code Lock PCB) £2.95



Kit and Construction Details

A complete kit of parts is available for this project. Full construction details may be found in the Maplin Project Book 8. See inside back cover of this catalogue.

Order

LK14Q (Codelock Kit) £21.95

MUSICAL ANNOUNCER

NEW

- ★ 28 Musical Effects of Tunes and Chimes
- ★ Variable Envelope for Piano to Organ Type Sounds
- ★ Three Control Switch Inputs
- ★ Can be Powered from 4 x 1.5V 'D' Cells or 6/12V DC PSU
- ★ Automatic Switch Off at end of Tune for Power Saving
- ★ No Special Setting Up or Musical Knowledge Required



The Maplin Musical Announcer is a ROM based music synthesiser with twenty-eight pre-programmed tunes, selected by two rotary switches. A short passage of the selected tune is played through an integral amplifier and loudspeaker whenever any one of the three control inputs is activated, making an ideal doorbell with a difference.

The following parts are not described elsewhere in this catalogue.

Front Panel

A stick-on printed front panel.

Order

FM49D (Musical Annncr Fr Pan) £1.55

Printed Circuit Board

Order

GB75S (Musical D.Bell PCB) £2.75

Kit

A complete kit of parts is available for this project excluding case, front panel, wire, batteries, battery holder and bell push.

Order

LK57M (Musical Announcr Kit) £13.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 13. See inside back cover of this catalogue.

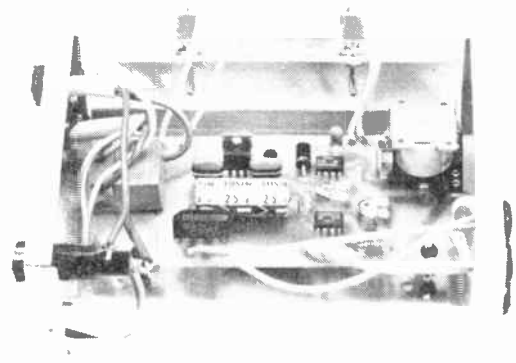
DOORBELL FOR THE DEAF

- ★ *Attracts attention with or without noise*
- ★ *Uses existing doorbell components*
- ★ *Simple to install*

For the hard of hearing or the deaf a doorbell is obviously useless. This project flashes a light or lights several times after the doorbell is pressed in an attempt to attract the attention of a deaf person. The bell can also be made to sound for the benefit of others including the person who rang it.

Printed Circuit Board and Construction Details

Full construction details may be found in the Maplin Projects Book 8. See inside back cover of this catalogue.



Order

GB20W (Doorbell PCB) £1.95

DIGITAL STOPWATCH

This electronic stopwatch is a comprehensive timer which is more robust than a mechanical stopwatch and can measure accurately to 100th of a second. It has remote start stop facility which enables it to be triggered by the interruption of a light beam or the sound of a starting pistol etc. The stopwatch has a large LED display which can be turned off while the clock is running to save battery power. It has four modes of operation: Standard — each timed event starts from zero, Sequential — the time between each operation of the start stop switch is displayed (lap times etc.), Split — the timer counts continuously although timings can be displayed whilst this occurs, Rally — the same as Standard except that the clock is not reset to zero but continues from when it was stopped.

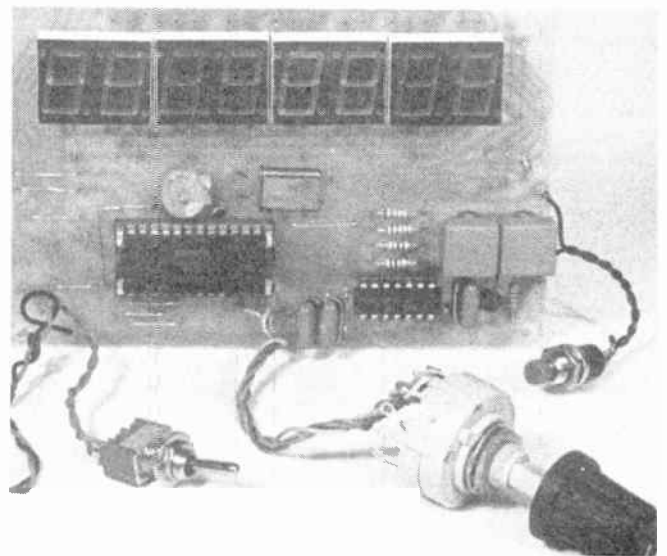
The following parts are not shown elsewhere in this catalogue.

PCB, Kit and Construction Details

A complete kit is available and includes ni-cad batteries. Full construction details may be found in the Maplin Project Book 2. See inside back cover of this catalogue.

Order

GA04E (Stopwatch PCB) £2.50
LW65V (Stopwatch Kit) £39.95



DIGITAL ENLARGER TIMER/CONTROLLER

- ★ *Wide timing range 1 to 99 seconds*
- ★ *High accuracy*
- ★ *Costs less than mechanical timers*
- ★ *Can switch up to 6A at 240V*
- ★ *Continuous display of timing count*

A high accuracy enlarger timer controller, compatible with enlargers up to 1.4kW. A wide range of timings are clearly and continuously displayed by the easily visible LED figures, allowing the operator to always be aware of the duration of the timings. Thumb wheel controls to set exposure times facilitate operation under darkroom conditions.

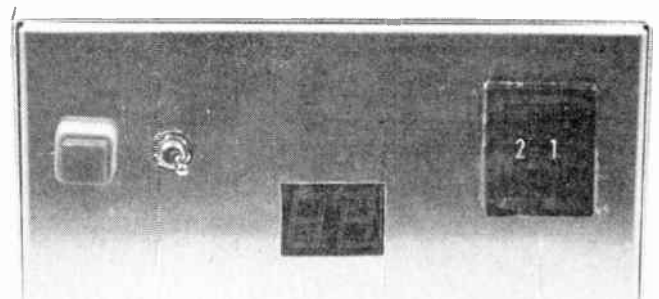
The following parts used in this project are not described elsewhere in this catalogue.

PCB, Kit and Construction Details

A complete kit of parts excluding the case is available for this project. Full construction details may be found in the Maplin Projects Book 7. See inside back cover of this catalogue.

Order

GB24B (Enlarger Timer PCB) £5.95
LK07H (Enlarger Timer Kit) £39.95



ENLARGER EXPOSURE METER

A simple exposure meter for use with an enlarger, having a working range covering over six stops. Phototransistor and comparator circuit allows light level to be found using a single calibrated potentiometer and LED indicator. There is also a battery check facility. Powered by one PP3 9V battery, not supplied with the kit.

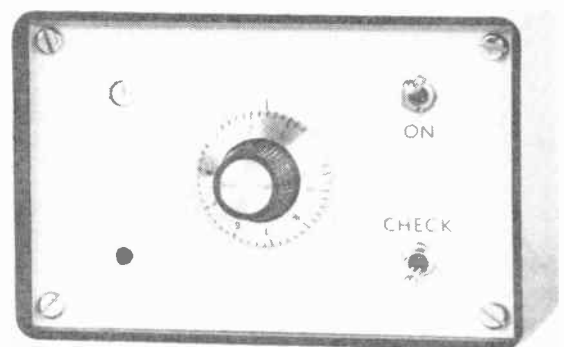
The following list of items do not appear anywhere else in this catalogue.

PCB, Kit and Construction Details

A complete kit of all parts including the case but excluding battery. Full constructional details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

Order

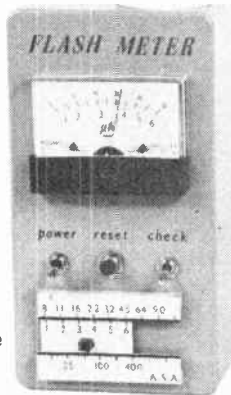
GB64U (Enlarger Exp Mtr PCB) 98p
LK44X (Enlarger Expsr Kit) £7.95



FLASH METER

- ★Simple to construct
- ★Can be used with variable power electronic flashguns
- ★No connection to camera required
- ★Makes finding the correct exposure easy

Inexpensive but sophisticated electronic flashguns have been available for some years now, and they offer what on the face of it is an ideal system of lighting for many applications. In practice there are problems that can make flash lighting a little difficult to use. Probably the most formidable of these is obtaining the correct exposure. Many cameras have a built-in exposure meter these days, but in most cases the meter does not function properly with flash lighting, and a special flashgun is needed for the few cameras which do support TTL automatic flash. This flash meter design covers a range of six or seven stops and is suitable for use with any normal electronic flashgun including the variable power type. It is very simple to use and does not require any connection from the camera to the meter.



NEW

The following items are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB78K (Flash Meter PCB) £1.75

Kit

A complete kit is available for this project, excluding case and diffuser.

Order

LK58N (Flash Meter Kit) £14.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 13. See inside back cover of this catalogue.

UNIVERSAL TIMER

This Universal Timer can be used to control up to 4 mains appliances switching them on and off at various times throughout the week. Typical applications for the timer would be switching on electric blankets, controlling the heating, recording radio programmes when out or controlling the lighting when on holiday to give the impression that the house was occupied. The timer uses the Texas Instruments TMS1121 IC, which contains a real time clock, which displays the time of day AM or PM and the day of the week, plus a 4-bit micro-computer which can be programmed to control the 4 outputs. It is possible to store up to 18 daily or weekly program times in the memory. The commands can be ON, OFF or SLEEP; the SLEEP command turns the switch on for 1 hour and then off. The programs are entered by push buttons on the front panel and can be of two types: 1. Fixed time programs. These are stored in the memory and executed at the same time every day or every week. 2. Interval programs. These are executed after a certain time has elapsed say in 2 hours time. These programs are executed once and then deleted from the memory. It is possible to display the programs that are stored in the memory and to delete them. In addition it is possible to switch the outputs directly from the keyboard. The front panel has a 4-digit LED display showing the time and 7 red LED's, one for each day of the week. There are 4 green LED's, one for each output, which light when the corresponding output is on. The 4 program LED's and the 3 other command LED's are used during programming and to display the programs in the memory. The unit has safe low-voltage links to controlled points where relays switch the appropriate appliance.

The following parts used in this project are not described elsewhere in this catalogue.

Connector

Order

HQ85G (Minicon Plug 10-Way) 50p

Printed Circuit Boards

Order

GA61R (Timer Main PCB) £2.95
GA62S (Timer Switch Board) £4.45
GA63T (Timer Relay PCB) 98p

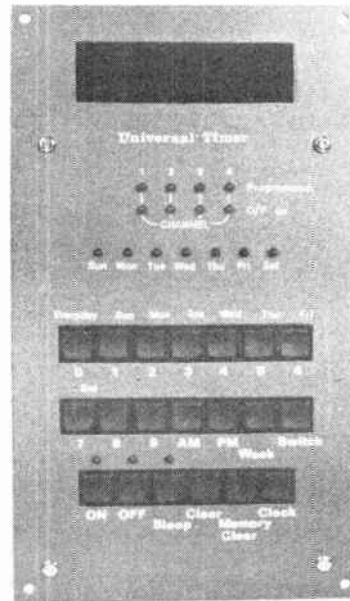
DIGITAL CENTRAL HEATING CONTROLLER

- ★Works with gas or oil-fired Central Heating
- ★Designed for reliability and adjustment-free service
- ★Eliminates wasteful standing losses

Make your heating system cool down fuel costs this winter! Maplin's Central Heating Controller will add economy and flexibility to your Heating System. The controller will work equally well with gas or oil systems, although "gravity primary" systems will require some alterations for the controller to work successfully. Two sets of controls are provided to allow independent control of hot water and heating, adding convenience and versatility to any central heating system. Please note that a printed circuit board is not available for this project and therefore this project is not covered by our 'Get You Working Service.'

Construction Details

Full construction details may be found in Maplin Project Book 5. See inside back cover of this catalogue.



Kit

A complete kit of parts for this project is available and includes the front panel. The kit does not include a box, nor does it include the parts to build the relay pcb's which must be ordered separately. For each relay board you will need one each of M47R, FF56L, YX97F, GA63T and six Veropins 2141.

Order

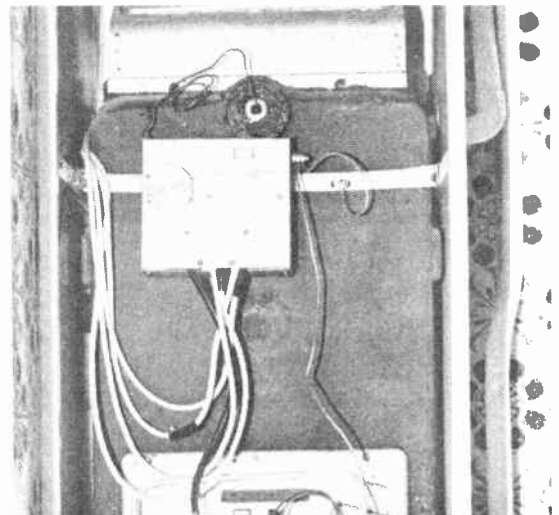
LW94C (Universal Timer Kit) £39.95

Front Panel and Construction Details

A fully printed and punched metal front panel. Full construction details may be found in the Maplin Projects Book 1. See inside back cover of this catalogue.

Order

GA64U (Timer Front Panel) £3.95



POWER CONTROLLER

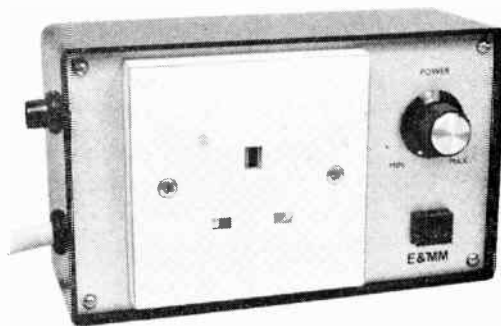
This versatile power controller is suitable for use as a lamp dimmer with standard or table lamps, and can also be used as a drill speed controller. It can handle loads of up to 720 watts, and this is more than sufficient for any normal domestic lamp or electric drill. The controller is easy and convenient to use since there is a mains outlet on top of the unit and the controlled equipment is merely plugged into this.

PCB and Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

Order

GA25C (Power Control PCB) 98p



2.8kW POWER CONTROLLER

★ Controls up to 12A at 240VAC

★ 99% power transfer

★ RFI suppression

★ Simple construction

Using the PC12 thick film IC this power controller can handle up to a 2.8 kilowatt load, which is sufficient for it to be used for providing precise control over lamps (but not fluorescent lamps), electric drills and other similar power tools, bar type electric fires up to 2kW, soldering irons and any other electrical appliance that can be operated from a variable AC source. The controller is fully suppressed to prevent mains borne and radiated interference in audio equipment, radios and TV's, etc. Contains its own fuse and neon indicator.

Printed Circuit Board

Order

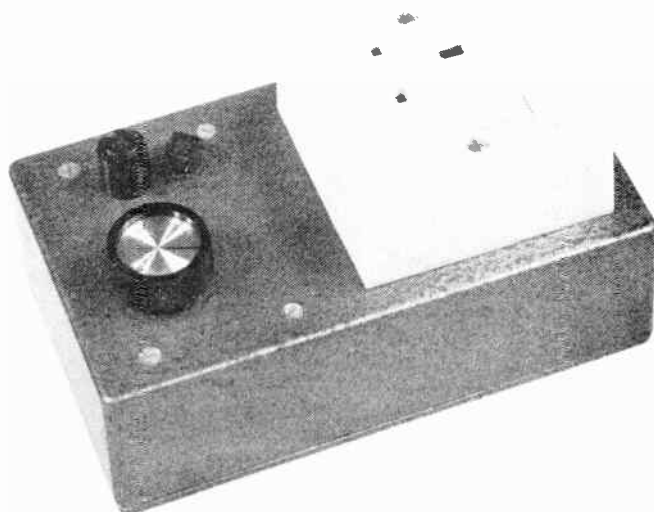
GB51F (Power PCB) £1.95

Kit

A complete kit of all parts excluding case.

Order

LK34M (2.8kW Pwr Cntrlr Kit) £18.95



Construction Details

Full construction details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

CAUTIOUS NI-CAD CHARGER

★ Battery polarity sensor

★ Constant current charging

★ Fast charge for scintered cells

★ Will accept up to 6 cells or one PP3

A constant current charger for ni-cad batteries, with an automatic charge timing system to prevent overcharging the cells, regardless of what state of discharge the cells are at, thereby avoiding the risk of foreshortening their working life. Will accept up to 6 cells in AA, AAF, C, D or SC styles or 1 PP3 style. Will also fast charge scintered type cells, and the timing cycle is electronically controlled. Once the charger has finished charging, it will maintain the cells in a fully charged condition until they are removed for use. Also has a battery polarity sensor.

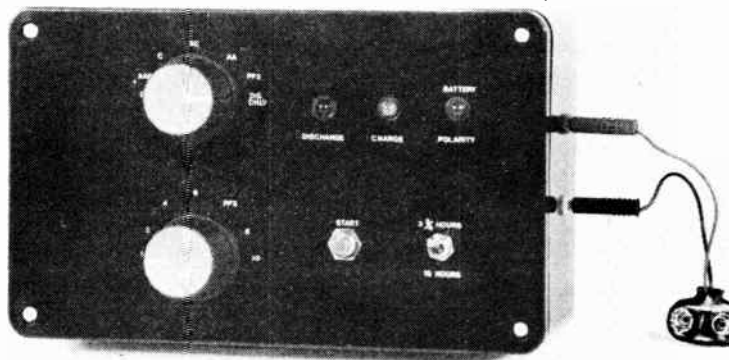
PCB, Kit and Construction Details

Complete kit less case and battery holders. Full constructional details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

Order

GB65V (Cautious Ni-Cad PCB) £2.45

LK50E (Caut Ni-Cad Ch Kit) £19.95



12V FLUORESCENT TUBE DRIVER MODULE

For 12 volt fluorescent lamps used in caravans, boats, for camping etc, this driver module is of a higher quality than the usual 'starter' circuit normally supplied with such lamps. Although intended to drive one 12 volt 8W fluorescent tube, it will operate two such tubes with negligible reduction in light output. Final light output strength can be chosen during construction, and is adjustable to a degree. Nominally consumes about 12 watts of power, and can be run for up to fifteen hours continuous use from the average car battery. Details of a suitable fluorescent tube can be found in the Opto Electrical section of this Catalogue.

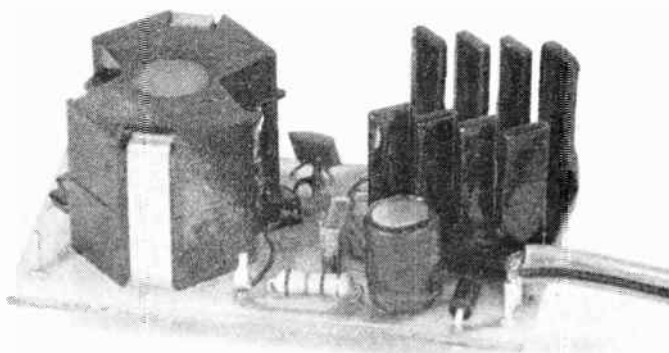
PCB, Kit and Construction Details

A complete kit of all parts is available. Full constructional details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

Order

GB52G (Tube Driver PCB) £1.95

LK35Q (Fluor Tube Drvr Kit) £7.95



220/240V INVERTER

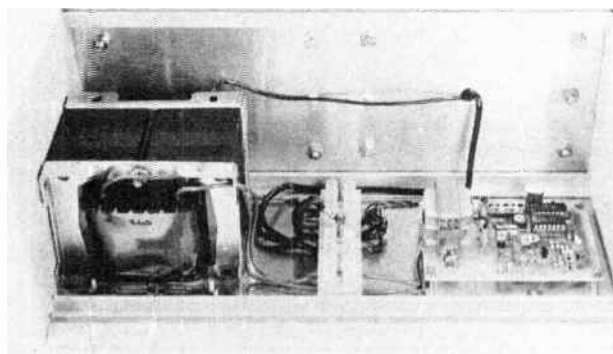
- ★ Will run 240V domestic appliances such as hi-fi, lights and central heating pump
- ★ Requires only standard 12V car battery
- ★ Ideal for camping and caravanning

Help lessen the effect of power cuts with the Maplin AC Inverter!! This simple project will power 240 volt lights, central heating pumps, small TV's and domestic appliances up to 60 watts, from a standard 12V car battery! Construction is straight-forward, and minimal setting-up is required, making this a project that even the novice constructor could tackle with confidence. The project features the ultimate in rugged reliability — power MOSFET output transistors.

The following parts used in this project are not described elsewhere in this catalogue.

PCB, Kit and Construction Details

A complete kit of parts excluding the case is available for this project. Full construction details may be found in the Maplin Projects Book 5. See inside back cover of this catalogue.



Order

GB12N (Inverter PCB)	£1.95
LW95D (Inverter Kit)	£59.95

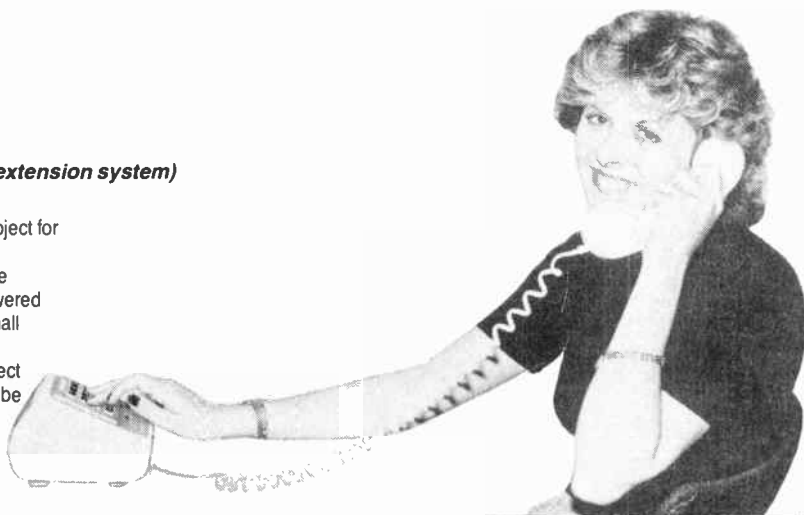
THE MAPLIN DIGI-TEL TELEPHONE EXCHANGE

Features:

- ★ Expandable from 4 up to 32 extensions
- ★ No call can be interrupted or overheard by another caller
- ★ Standard 2-wire connection to telephones
- ★ All phones powered by the two wire line
- ★ A mains connection is only required at the exchange
- ★ May be used with standard British Telecom phones
- ★ Up to 16 telephones may be used at any one time (in full 32 extension system)

A telephone exchange of any capacity has not, until now been a feasible project for the amateur constructor, due to its size, power requirements, cost and non-availability of electro-mechanical switches. This project is a complete 32-line internal automatic exchange using solid state switching techniques and powered from the mains supply. The system is suitable for use in the home or in a small business or factory, and requires only two wires from each extension to the exchange unit. Ordinary British Telecom type telephones with loop disconnect dialling and AC ringing can be used with this exchange. The exchange may be equipped with as few as four or as many as thirty-two extensions.

The following parts used in this project are not described elsewhere in this catalogue.



Pre-Programmed EPROM's

A 2716 EPROM pre-programmed for use in the Telephone Exchange project. Type M4 is for the first 16 lines and M5 is for lines 17 to 32.

Order

QY25C (2716/M4)	£5.95
QY60Q (2716/M5)	£5.95

Printed Circuit Boards

Order

GB04E (E.L.C.Board)	£6.95
GB05F (Connect PCB)	£3.95
GB06G (T/E Motherboard)	£19.95
GB07H (T/E PSU PCB)	£5.95

Digi-Tel ELC Kit

A complete kit of all the parts you need to build four extension line circuits (i.e. one ELC PCB)

Order

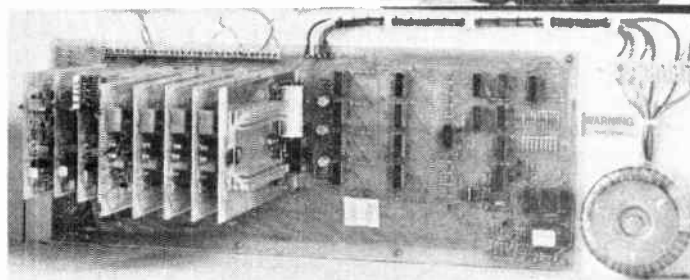
LW80B (Digi-Tel ELC Kit)	£29.95
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Digi-Tel Connect Circuit Kit

A complete kit of all the parts you need to build one connect circuit. We recommend you fit one connect circuit for every four extensions.

Order

LW81C (Digi-Tel Connect Kit)	£10.95
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Digi-Tel Main Kit

A complete kit of everything you need to build the Digi-Tel Motherboard and PSU for 16 lines. It also includes some miscellaneous parts, but does not include any telephones or four-wire cable.

Order

LW82D (Digi-Tel Main Kit)	£99.95
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Digi-Tel Expansion Kit

A complete kit to build the 17 to 32 line expansion. As above it does not include the telephones or four-wire cable.

Order

LK37S (Digi-Tel Expdr Kit)	£129.95
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Construction Details

Full construction details for Digi-Tel up to 16 lines may be found in the Maplin Projects Book 4, and for the 17 to 32 line extension in Maplin Projects Book 10. See inside back cover of this catalogue.

DIGITAL MULTI-TRAIN CONTROLLER

Features:

- ★ 14 locomotives individually controlled on the same track
- ★ Any 4 locomotives controlled simultaneously
- ★ Automatic short circuit protection

Railway enthusiasts have for many years appreciated the need for a control system that enables trains to be driven as if the operator were in the driving cab of the locomotive. This not only means control of speed and direction of that locomotive, but also the ability to move anywhere on the layout without the need for track isolating or switching, thus making the wiring of the layout much simpler.

This system fulfills all these needs by producing a constant 18V DC on the track with digital information superimposed on it, to which only the selected train or trains will respond. The permanent track voltage also means that locomotives' headlights, carriage lighting and many accessories may be used unaffected by the speed of the trains. This system can control up to 14 locomotives all on the same track, and any four of these may be driven independently at one time. Provision is also made for any or all of the four control units to be operated by a 7-bit digital input, thus enabling remote control either from hand-held units (using wire or radio) or from a home computer, giving full control of direction and speed.

The following parts used in this project are not described elsewhere in this catalogue.

Case

A punched and painted aluminium case with sloping front.

Order

XG09K (Train Control Case) £11.95

Front Panel

A printed and punched self-adhesive front panel that will fit on the train control case or may be used with your existing control panel.

Order

XX47B (Train Cntrl Front Pnl) £2.95

Printed Circuit Boards

Order

GA72P (Train Common PCB) £2.95
GA73Q (Train Control PCB) £2.45
GA74R (Train Receiver 1 PCB) £1.45
GA75S (Train Receiver 2 PCB) 95p

Train Common/PSU Kit

This kit contains all the parts required including the front panel but not including the case.

Order

LW61R (Train Common/PSU Kit) £29.95

REMOTE CONTROL FOR DIGITAL MULTI-TRAIN CONTROLLER

This addition to the Digital Multi-train Controller enables any or all of the four control boards to be commanded by an eight-bit digital input either from a remote controller or a computer. The data for each controller is latched and thus one train can be set running and the command changed to another controller to enable up to four trains to be controlled simultaneously by the external input. The link to the main controller may be wired or achieved by infra-red or radio remote control. With the Remote Data Latch Board fitted it is possible to have computer control of the trains.

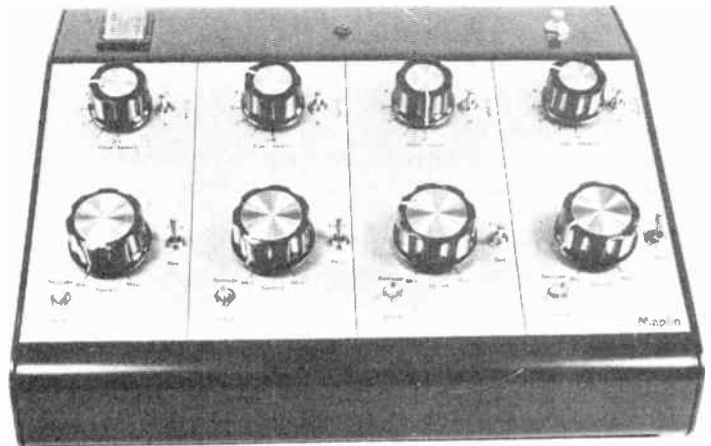
The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Order

GA84F (Remote Data Ltch PCB) £1.95
GA85G (Data Encoder PCB) £2.45
GA86T (Data Decoder PCB) £2.45
GA87U (IR Tx PCB) £1.25
GA88V (IR Rx PCB) £1.25
GA89W (27MHz Tx PCB) 95p

- ★ Supply always present for carriage lighting etc
- ★ Remote control and computer interfacing
- ★ Low cost, two wire system



Train Control Kit

All the parts you need to build one controller. Up to 4 will fit into the case.

Order

LW62S (Train Control Kit) £8.95

Receiver Kits

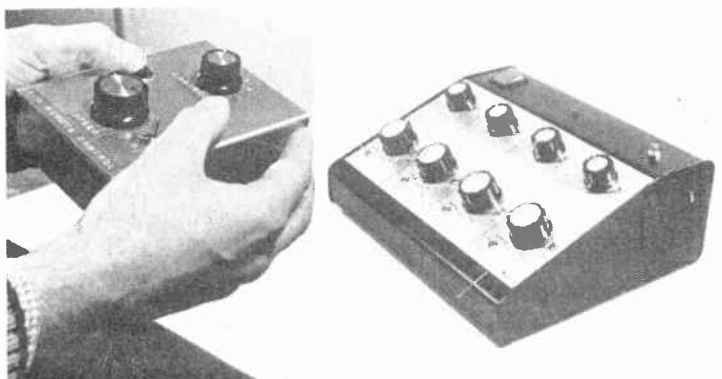
A different kit is required depending on whether the train to be fitted with the kit is to operate in Group A or Group B. For Group A use an ML926 Kit and for Group B use an ML927 Kit. Each kit is available with one of two types of pcb's. Receiver 1 Kits contain a long thin pcb designed to fit in diesel locomotives or tender-drive locomotives. Receiver 2 Kits contain a squarer pcb designed to fit in tank locomotives.

Order

LW63T (Train Rcvr1 ML926Kit) £9.95
LW64U (Train Rcvr2 ML926Kit) £9.95
LW68Y (Train Rcvr1 ML927Kit) £8.95
LW69A (Train Rcvr2 ML927Kit) £8.95

Construction Details

Full construction details may be found in the Maplin Projects Book 2. See inside back cover of this catalogue.



Construction Details

Full construction details may be found in the Maplin Project Book 3. See inside back cover of this catalogue.

CONTROL-A-TRAIN

- ★ Pulse Width Modulated for Excellent Low Speed Performance
- ★ Inertia Control of Momentum and Braking
- ★ Box or Panel Mounted
- ★ Easy to Build
- ★ Low Cost

Things have moved on from the days when model train controllers were little more than a rectifier and a high power potentiometer (called a 'rheostat'), and using modern electronic devices it is possible to produce a simple controller that has quite advanced facilities. This design is based on just two operational amplifiers but it has a pulsed output for good starting and low speed performance, plus simulated inertia, momentum and braking. It also has output current limiting which protects the circuit when the inevitable overloads and short circuits occur. The unit is designed to operate from the 15 volt AC output from a train transformer or from the 15 volt AC auxiliary output of a train controller, or it could easily be built as a self-contained unit having its own built-in mains transformer if desired although details are not given for this. It should also operate from the 12V DC output of a train controller or transformer unit.

This controller uses the method of pulse control; the idea is to provide a series of output pulses that drive the motor at full power. The average output voltage (and thus the speed of the train) is varied by altering the mark-space ratio of the output signal. A must for all serious model train enthusiasts looking for a life-like, hands-on-throttle feel for their models.

The following are not described anywhere else in this catalogue.

Printed Circuit Board

Order
GB87U (Control-A-Trn PCB) £1.99

Printed Stick-On Front Panel

Order
FT40T (Cntrl-A-Train Fr Pan) £1.75



Heatsink

Heatsink bracket for Control-A-Train.

Order
FT53H (Cntrl-A-Trn Heatsink) 38p

Kit

A complete kit of all parts to build this project not including case and 4mm wander plugs.

Order
LK64U (Control-A-Train Kit) £11.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 14. See inside back cover of this catalogue.

8 CHANNEL FLUID DETECTOR

Using the LM1830 fluid detector IC, this module will provide an indication of water level to eight demarcations over whatever range chosen, or water level in eight separate locations, or any combination of the two. Eight LED indicators form a visual display of fluid level, which can be made compatible with the location and meaning of the eight probes. Applications include monitoring level in water tanks, for the automatic switching of electric valves and pumps, car windscreen washer bottle 'low' warning, the watering of greenhouse plants; your imagination is the limit. Requires a 12 volt DC supply.

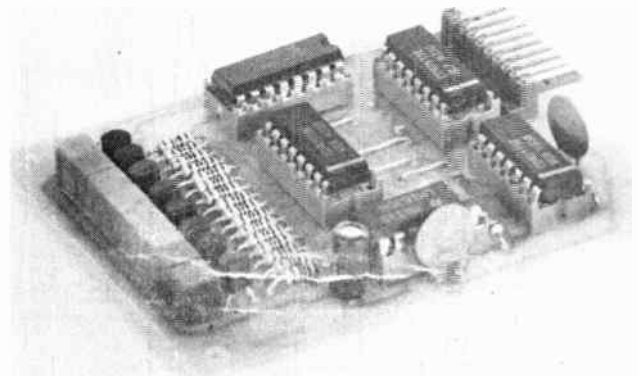
Printed Circuit Board

Order
GB66W (8 Ch Fluid Dctr PCB) £2.95

Kit

A complete kit of all parts

Order
LK48C (8 Ch Fluid Dctr Kit) £12.95



Construction Details

Full constructional details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

MAINS CONTROLLER

Exclusively for use with the 8-channel Fluid Detector. The instructions for this project include suggestions for modifying the 8-channel detector to operate relays as well as LED indicators. The mains controller has logic controlled relays for the purpose of operating mains equipment, e.g. pumps, valves, etc. This project allows complex control over the water level in a tank where a pump is used to partially empty the tank when the level has reached a certain threshold as determined by the fluid detector. If the tank was being filled from a continuous supply of water, the controller can cut this off via an electric inlet valve until the pump has done its work, to prevent the tank overflowing. All this is primarily controlled by the 8-channel fluid detector. PCB mounted terminal blocks are provided for simple connection between module and appliances.

The following items are not described elsewhere in this catalogue.

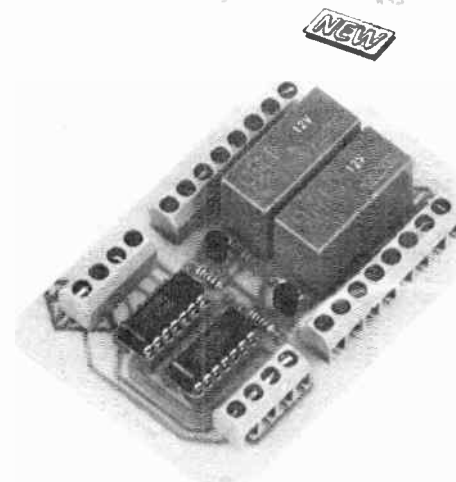
Printed Circuit Board

Order
GB77J (Mains Cntrlr PCB) £2.99

Kit

A complete kit of all parts to make this project available.

Order
LK59P (Mains Cntrlr 8Ch Kit) £8.95



Construction Details

Full constructional details may be found in the Maplin Magazine Issue 13. See inside back cover of this catalogue.

PE MAGNUM METAL DETECTOR

A very high quality induction balance metal detector designed with ease of construction for the home builder in mind. The design uses the superior 'pinpoint' search coil used in some of the most expensive metal detectors around. It is also totally unaffected by changes in the soil such as wet sand, dry iron oxide rich ground etc. With this design the user should soon learn to discriminate between junk such as silver paper and the things worth digging for.

Construction Details

A reprint of the article originally published in 'Practical Electronics' is available as well as the special pcb's. All other parts required are listed in this catalogue except for some of the hardware that can be obtained from most hardware stores.

Order

XF44X (Magnum Booklet) **75pNV**

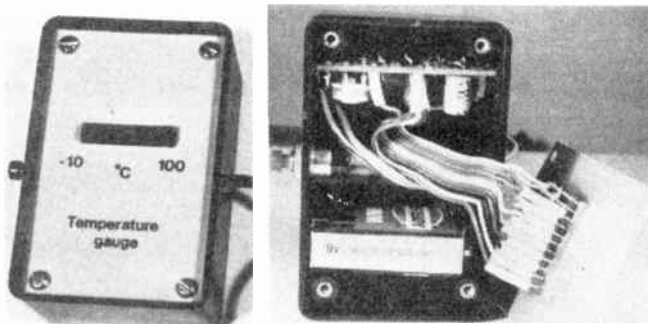
Printed Circuit Boards

Order

YQ44X (Magnum 1 PCB) **£3.95**
YQ45Y (Magnum 2 PCB) **£3.95**
YQ72P (Magnum Mode Chng PCB) **£1.95**



TEMPERATURE GAUGE



This thermometer gives a visual indication of temperature in approximately 10°C intervals from -10°C to 100°C. It uses the LM335Z temperature sensor and the LM3914 bargraph display driver. The latter converts the sensor's output to drive different colour LED indicators which are formed in a block display. The design presented is for a general purpose temperature gauge, being hand-held with the sensor on a flying lead. However, in response to many requests, information for adaption to a car thermometer is given.

Construction Details

Full construction details may be found in the Maplin Project Book 1. See inside back cover of this catalogue.

MULTI-CIRCUIT BOARD PROJECTS



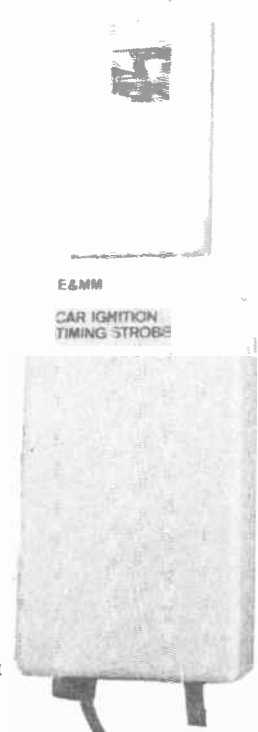
A printed circuit board to complement the book "Multi-Circuit Board Projects" by R.A. Penfold. The book shows how to build 21 different projects all of which can be built on the same pcb, one at a time. The projects are an electronic doorbuzzer, a light detector, a darkness detector, a latching light detector, a continuity tester, the bent wire game, a morse practice oscillator, a low voltage alarm, a high voltage alarm, a water activated alarm, a transistor checker, a model railway signal, electronic heads or tails, a signal injector, a computer voice, a games timer, a guitar pre-amplifier, a guitar treble booster, a general purpose pre-amplifier, a signal tracer and a quiz monitor. The book WA36P is described on page 49.

Order

GA79L (Multi-circuit Board) **£1.30**

CAR IGNITION TIMING STROBE

In order to gain the maximum efficiency, economy and performance from a petrol engine, the ignition must be set to fire at a certain point in the firing sequence: this is normally just before the piston reaches the top of the compression stroke (known as top dead centre). A few degrees out and the fuel consumption and performance will suffer with possible damage to the engine. An engine in which the ignition is retarded will suffer from lack of power and possibly overheat, while an engine in which ignition is advanced will give off a metallic knocking sound (PINKING). There will also be undue strain put on the pistons and crankshaft bearings which could eventually lead to expensive engine damage. One way of setting the ignition timing is to rotate the engine either by hand or on the starter, until the timing marks on the crankshaft pulley or the engine flywheel line up with the corresponding marks on the engine; then rotate the distributor body until the points just open. This is not an accurate method, although useful for initially setting the timing. A more accurate setting can be obtained using the unit described. The unit has three leads — two connect to the battery and one to the spark plug which is to be used for setting the timing. Commercial units are available which perform the same function, but they either work off the mains or utilise a neon lamp whose light output is sometimes insufficient. Commercial units which utilise a Xenon strobe tend to be expensive. This unit however, offers a high power Xenon flash tube at a very reasonable cost to enable you to tune your car engine for top performance.



Printed Circuit Boards

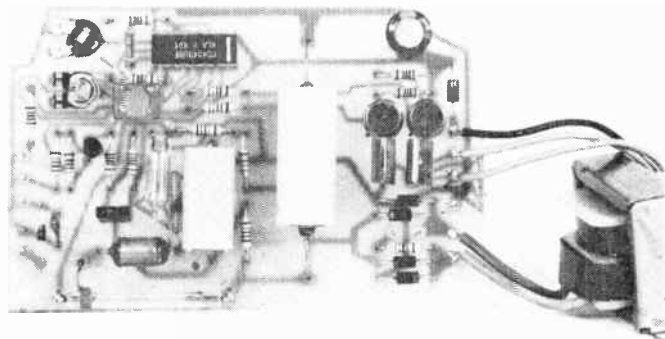
Order

GA22Y (Strobe Main PCB) **£1.95**
GA23A (Strobe HT PCB) **£1.20**

Construction Details

Full construction details may be found in the book E&MM Projects Volume 1 described at the end of this section.

XENON FLASH TUBE DRIVER



A driver module using the Xenon flash tube and triggering transformer shown on page 206 of this catalogue. The trigger transformer is energised by the capacitive discharge method, while power for the tube is derived from a variable frequency inverter developing EHT up to 1kV. Applications are many and varied, including slave flash for photography, warning beacon, strobe and special lighting effects. Trigger source may be either from an on board clock for strobe, or external switching. A neon indicator is included which illuminates when the module is 'ready' for the next flash.

Printed Circuit Board

Order

GB61R (Xenon Tube Dr PCB) **£2.40**

Kit

A complete kit of all parts.

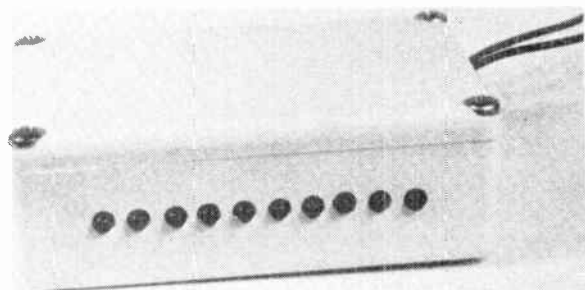
Order

LK46A (Xenon Tube Drive Kit) **£11.95**

Construction Details

Full constructional details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

CAR BATTERY MONITOR



Any number of things from a faulty alternator to left-on headlights can result in a flat car battery — and the first thing you are likely to know about it is when you turn the key one morning and the car won't start! This useful little unit is designed to warn you in advance by displaying the battery's state of charge with a row of ten LEDs. The Monitor costs less than a tenner to build, and since it consumes a miserly 20mA, can be left connected directly to the battery all the time. The Car Battery Monitor will even reveal faults like a slipping fan-belt, which prevents the battery charging but leaves the dashboard battery warning light off, and show how the battery is handling the strenuous work of starting the car (it takes 20 minutes of running to put back what a five-second start takes out).

The following list of items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GA19V (Batt Mon PCB) **£1.20**

Kit

The Car Battery Monitor is available as a kit.

Order

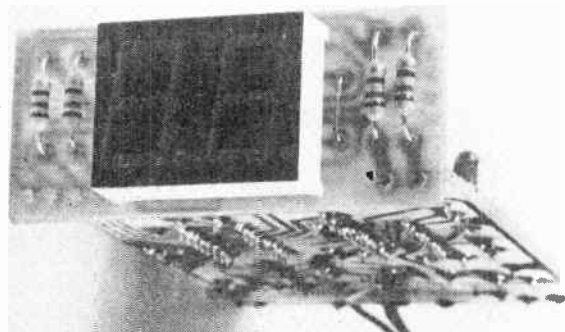
LK42V (Car Batt Monitor) **£6.95**

Construction Details

Full construction details may be found in the book E&MM Projects Volume 1 described at the end of this section.

CAR DIGITAL TACHOMETER

In these days of ever-higher motoring costs the unit described here will help the driver to change gear at the most advantageous point to save fuel and extend engine life. Anyone using a car to tow a trailer or caravan will also benefit by being able to make the best use of the torque available from the engine. Conventional tachometers give a display of engine speed on a millimeter, usually with a scale of about 270° arc. Pulses produced by the action of the contact breakers are integrated and fed to the meter to give an analogue display of engine revolutions.



The disadvantages are that an average reading is displayed, which can easily lag behind rapid speed changes, and the meters tend to be somewhat fragile. This tachometer overcomes both of these disadvantages by counting pulses and displaying engine revolutions over a very short time, the digital display being continuously updated. Two digits display the number of revolutions x 100. The unit is designed for negative earth cars. If you are not sure of the polarity on your car a glance at the owners manual or even at the battery connections will tell you. Construction is very straight-forward, using two printed circuit boards which fit directly in the case without the need for mounting bolts, so the project can be tackled by any but the most inexperienced constructor.

Printed Circuit Boards

Order

GA26D (Dig Tacho Main PCB) **£1.95**
GA27E (Dig Tacho Dsply PCB) **95p**

Kit

A kit is available. The case is not included.

Order

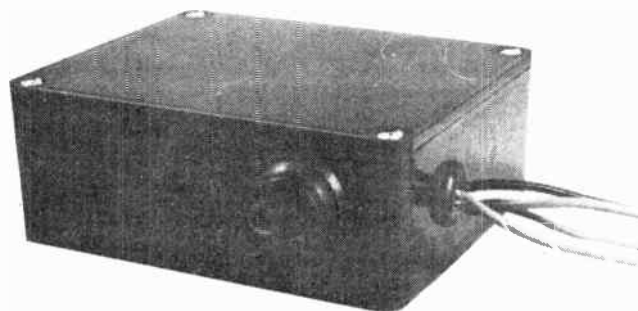
LK79L (Car Digtl Tacho Kit) **£16.95**

Construction Details

Full construction details may be found in the book E&MM Projects Volume 1 described at the end of this section.

CAR ELECTRONIC IGNITION SYSTEM

A high performance electronic ignition system for negative earth cars. The unit is very easily connected and the conventional ignition system can be returned to at any time. The electronic ignition system has many advantages over conventional systems, for example, fuel saving, quick starting on very low battery voltages, more power at high revs, points wear reduced. For the 1μF capacitor required, use FA24B.



The following parts used in this project are not shown elsewhere in this catalogue.

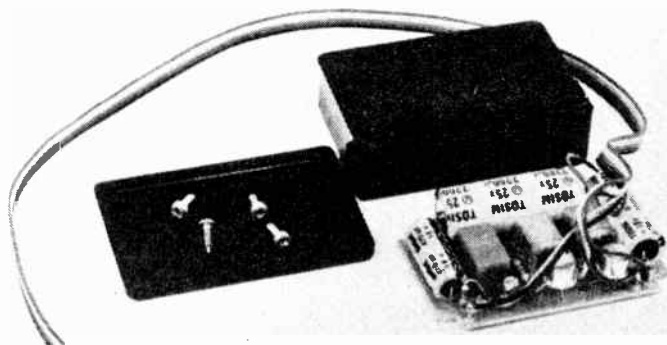
PCB's and Construction Details

Full construction details are given in our leaflet MES 16.

Order

XX40T (Ignition PCB) **£1.50**
XX41U (Ign Mtg Plate) **98p**
XH27E (MES16) **15pNV**

CAR BURGLAR ALARM



There are many alarms available on the market, but none can offer complete protection against theft. Though no alarm will foil the professional thief, it will act as a deterrent to the small time thief or joyrider. This circuit, like most alarms, is triggered off by the door contacts for the courtesy light and will only work when fitted to a 12V negative car. The switch to the alarm is fitted on the inside of the car as opposed to the outside, thus ensuring that the switch is not tampered with. The idea is, when leaving the car the alarm switch is turned to the on position and the 'arm' button is pressed. It is now safe to open the doors and get out of the car. After pressing the 'arm' button a timer circuit allows approximately 60 seconds to leave the car and shut the doors. After the 60 seconds, providing the doors are shut, the circuit will arm itself. If a door is then opened, the horn will sound after 15 seconds. The 15 second delay is sufficient time for the occupant to turn off the alarm, but not enough time for the thief to tamper with the switch. The horn will sound for a further 1½ minutes and the alarm will then arm itself again. If the door is left open the alarm will sound continuously.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA98G (Car Burglar Alrm PCB) £1.30

Kit

A complete kit of parts is available for this project.

Order

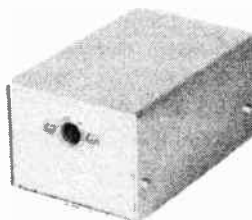
LW78K (Car Burglr Alarm Kit) £7.45

Construction Details

Full construction details may be found in the Maplin Projects Book 4. See inside back cover of this catalogue.

CAR AERIAL BOOSTER

Although a normal car aerial has the useful feature of being omnidirectional. It is less than ideal in terms of signal pick-up. This often results in a weak and noisy reception on both the AM and FM bands, especially in areas of relatively low signal strength. This aerial booster is simply inserted



between the aerial lead and the car radio aerial socket, the only other connection that is required is one to the positive side of the car battery. The booster is only suitable for 12 volt negative earth systems, but this system is used in most vehicles today. The unit is effective over medium, long, low frequency short wave, and VHF broadcast bands. The degree of improvement obtained depends on a number of factors but in general there would be a substantial improvement in results if the booster was employed with an insensitive receiver in a poor reception area, and little or no improvement if it was used with a receiver having "state of the art" design in a strong reception area.

Printed Circuit Board

Order

GA40T (Car Aerial Bster PCB) £1.45

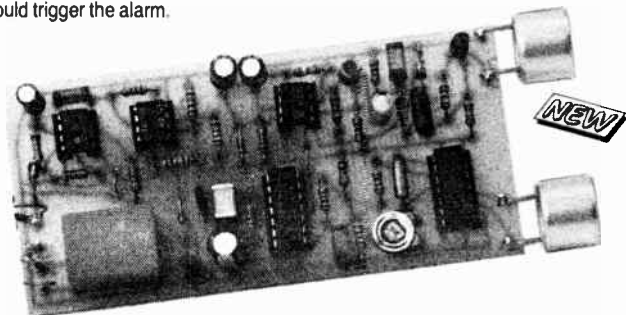
Construction Details

Full construction details may be found in the book E&MM Projects Volume 1 described at the end of this section.

ULTRASONIC CAR ALARM

Although a few years ago a couple of concealed switches provided a good and in most cases, adequate means of defeating car thieves, these days something a little more sophisticated is really required. One reason for this is that car thieves are generally familiar with simple forms of alarms, immobilisers, etc, and means of overcoming them. Perhaps of more relevance, it is common for quite expensive items to be left in cars, either in the form of loose items in the back of the car or as car accessories such as radios, cassette players, compact disc players, and the like. Many car alarms are of little or no use against someone who breaks or forces open a window and removes items from inside the car.

This burglar alarm design is basically the same as the ultrasonic movement detector type that is often used to protect homes and other buildings. By detecting movement inside the car using the doppler shift principle, it renders the method of entry irrelevant, and even someone reaching in through a window left slightly open should trigger the alarm.



The circuit incorporates an Exit Delay Timer which prevents the unit from being activated until several seconds after it has been switched on, giving the user an opportunity to leave the car without triggering the alarm. This is an important feature as it enables the on/off switch to be positioned inside the car, rather than having to rely on a concealed switch somewhere on the outside of the car. A short duration Entry Delay is also included so that the user can enter the car and deactivate the alarm before it sounds. Once activated the alarm operates the car horn which is pulsed at approximately 1Hz creating an 'urgent' sound. This will last for approximately 10 minutes and then the unit will reset automatically.

The following items do not appear anywhere else in this catalogue.

Printed Circuit Board

Order

GB93B (U/Sonic Car Alrm PCB) £4.95

Kit

A complete kit of all parts is available.

Order

LK75S (U/Sonic Car Alrm Kit) £17.95

Construction Details

Full construction details may be found in the Maplin Magazine Issue 15. See inside back cover of this catalogue.

DIGITAL MILES-PER-GALLON METER



- ★ Discover your car's most economical cruising speed
- ★ Save petrol with this easy to build device
- ★ Large easy to read LED display

With the price of petrol continuing on its upward spiral, any device which can offer some means of economising on fuel consumption must be a winner! This mph meter uses readily available transducers and produces a continuous display of fuel consumption under all driving conditions. Using the meter, it is thus possible to compare the petrol used when accelerating and cruising at speed; it is also possible to find the driving conditions which yield the optimum fuel consumption.

The basis of the design is two transducers; one transducer produces a signal in response to the flow of fuel, whilst the other is connected into the speedometer drive cable and gives an output which corresponds to the road speed. The meter takes these two signals and produces a continuous digital display of miles per gallon of fuel.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Order

GA76H (MPG Meter Main PCB)	£1.95
GA77J (MPG Meter Disply PCB)	£1.50

Kit

A complete kit of parts is available for this project.

Order

LW67X (MPG Meter Kit)	£59.95
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Construction Details

Full construction details may be found in the Maplin Projects Book 2. See inside back cover of this catalogue.

LOW POWER RADIO CONTROL SYSTEM



- ★ 27MHz Operation For Ground-Based Model Control
- ★ Two Positive Pulse PWM Channels
- ★ Two Digital On/Off Channels

Since 1981 and the legalising of Citizens Band Radio on 27MHz, the licensing requirement for model radio control is no longer operative. However, certain conditions apply to both users of this band, and for RC modellers this means that signal transmissions must be within the frequency range 26.96MHz to 27.28MHz at a maximum mean power of 1.5W. Higher frequencies on this band are used for CB transmissions. The 35MHz band (35.005 to 35.205) is also available for radio control, but for use with model aircraft only - not ground-based models, and the 458MHz band would be complex for constructors to set up and align. Therefore a 27MHz system is used with limited power output and receiver sensitivity to avoid interference both to and from other users on the band.

Although capable of six channel operation the design utilises two channels (1 and 2) for pulse width modulation (PWM) and four channels for encoded digital (on/off) information.

The following items are not described elsewhere in this catalogue.

27MHz Transmitter

Printed Circuit Board

Order

YQ69A (LM1871 Xmitter PCB)	£1.25
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Kit

A kit for the 27MHz transmitter is available – does not include crystal, batteries, aerial and hardware.

Order

LK55K (27MHz Transmitttr Kit)	£6.95
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27MHz Receiver

Printed Circuit Board

Order

YQ70M (LM1872 Receiver PCB)	£1.20
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Kit

A kit for the 27MHz receiver is available does not include crystal, batteries, aerial and hardware.

Order

LK56L (27MHz Receiver Kit)	£8.95
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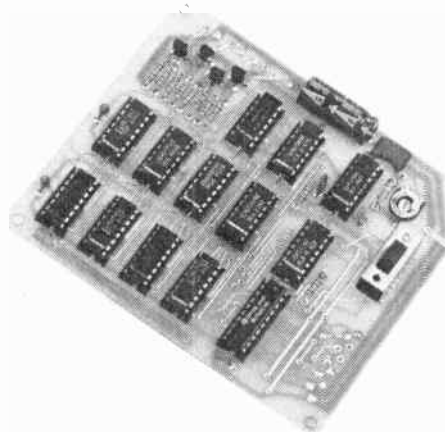
Construction Details

Full constructional details may be found in the Maplin Magazine Issue 13. See inside back cover of this catalogue.

4-CHANNEL PWM CONTROLLER



- ★ 4-Channel PWM (0-5ms) Outputs
- ★ Internal or External Synchronisation
- ★ High or Low Strobe Input
- ★ Compatible with many Model Servo and Motor Drive Systems



This module allows the use of either mechanical switching or computer control for developing four 20ms frame, 0-5ms + V PWM channel outputs suitable for model servo mechanisms and motor control systems. Mechanisms and motor systems are available from MAPLIN and find applications in Robotics, Model Kits or Educational Demonstrations. Eight data inputs are used to drive the module of which the first six (D0-D5) determine the output PWM and the remaining two select 1 of the 4 available channels.

The module uses an on-board clock to latch 6-bit data into a down counter which provides the pulse width timing of any of the four outputs selected in the range zero to 5ms, this process runs on a 50Hz time base. Data (pulse width number) can be changed at any time for any of the four channels, and output drive is taken care of by emitter follower buffers which will source low impedance ancillaries compatible with the 20ms PWM standard such as model servos and small motor driver modules.

The following items are not listed elsewhere in this catalogue.

Printed Circuit Board

Order

GB83E (4 Ch Servo Cntrlr PCB)	£7.95
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Kit

A complete kit comprising all parts for this project is available.

Order

LK61R (4 Ch Servo Cntrlr Kt)	£24.95
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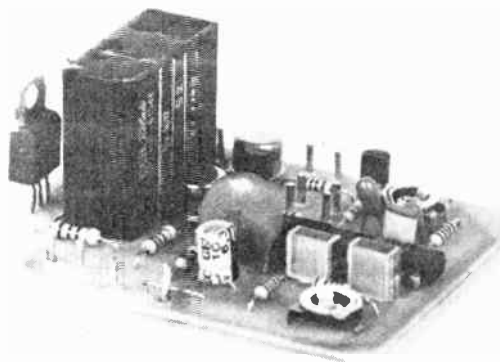
Construction Details

Full constructional details may be found in the Maplin Magazine Issue 14. See inside back cover of this catalogue.



0702 552911

PWM MOTOR DRIVE MODULE



- ★6 – 12V Forward and Reverse Model Motor Driver
- ★Proportional Control Offers Smooth Transition from Off to Full Speed
- ★Ideal for Model Boats, Cars and Robotics

A Model Motor Drive Module that will operate a small electric motor in either direction as required, with proportional speed control using the Pulse Width Modulation method. The output circuitry will handle motor stall currents up to 5A, and uses a power pack independent of the control circuit batteries, thus avoiding upsetting modulation of the control circuit. The motor driver initially caters for 6V motor and battery combinations (the model radio control standard), but optional extras can be added to upgrade the module for 12V operation, and provide for increased current output demanded by the bigger motors, e.g. electrically driven model aeroplanes. The module also finds applications in robotics, where computer control of movement and direction is required.

Printed Circuit Board

Order

GB71N (PWM Motor Drive PCB) £1.75

Kit

A complete kit excluding optional relay and capacitors.

Order

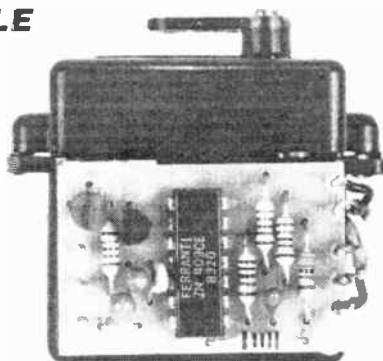
LK54J (PWM Motor Drive Kit) £9.95

Construction Details

Full constructional details may be found in the Maplin Projects Book 12. See inside back cover of this catalogue.

MODEL CONTROL SERVO DRIVER MODULE

A complete servo mechanics module of small dimensions (37 x 25mm), ideal for model control, robotics and other electro-mechanical control applications. Intended to work from a Pulse Width Modulated signal of between 0.5 and 2.5ms, on a 20ms frame rate, compatible with most proportional radio control transmitter/receiver systems. The output lever shaft will operate through 180 degrees. Requires a power supply in the range of 4.2 – 6.5V DC, capable of up to 1A output.



Printed Circuit Board

Order

GB68Y (Servo Driver PCB) 98p

Kit

Complete kit including servo mechanism.

Order

LK45Y (Servo & Driver Kit) £10.95

Construction Details

Full constructional details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

RTTY UNIT TU1000



STAR BUY

'RTTY' is an abbreviation of 'Radio Teletype', a means of transmitting and receiving information by radio in the form of the written word. RTTY can be used in place of telephone modem's to the advantage of avoiding telephone bills. Although in order to transmit the user must hold an amateur radio transmitting licence, this isn't the case if 'listening' only is intended. The TU1000 converts RTTY signals (from the short-wave band) into RS232 logic compatible with home computers having this facility. The TU1000 requires the addition of a short-wave communications receiver, that need not be necessarily expensive. The TU1000 will also encode RS232 into RTTY should you have the required transmitting licence and a communications transceiver. The short-wave bands abound with commercial stations sending news, weather reports and other services, 24 hours a day. You will need a receiver with SSB demodulation to receive them. Almost any station can be received by the TU1000 as it is very versatile, having fixed and variable tone shifts, VCO controlled filters etc.

The following list of parts are not described elsewhere in this catalogue.

Front and Rear Panels

Order

FJ53H (TU 1000 Front Panel) £2.50
FJ54J (TU 1000 Rear Panel) £1.95

Printed Circuit Boards

Order

GB67X (RTTY Terminal PCB) £8.95
GB73Q (Meter PCB) £1.75

Kit

A complete kit of parts excluding case and other optional items.

Order

LK53H (TU1000 RTTY Kit) £49.95

Construction Details

Full constructional details may be found in the Maplin Projects Book 12. See inside back cover of this catalogue.

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DXER's AUDIO PROCESSOR



- ★No Modifications To Receiver
- ★High Filter Attenuation Rate
- ★Easy Construction

Primarily designed for use with receivers lacking really good IF filtering, the processor features a lowpass filter giving a 36dB per octave attenuation over 2.5kHz, a high pass filter with 18dB per octave attenuation under 150Hz and an expander which severely attenuates noise during pauses in the received speech. The unusually high attenuation rates and the expander combine to make this one of the best circuits on the market for improving intelligibility and reducing background noise and adjacent channel interference. The unit is especially suited for SSB and FM CB reception and simply fits between the receiver's audio output and the headphones — thus no modification is necessary to the receiver. The single pcb makes construction very simple.

The following items used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB19V (Audio Processor PCB) £1.95

Kit

A complete kit of parts excluding case and knobs is available for this project.

Order

LK05F (D'Xers Processor Kit) £9.95

Construction Details

Full construction details may be found in the Maplin Projects Book 7. See inside back cover of this catalogue.

80 METRE AMATEUR RECEIVER

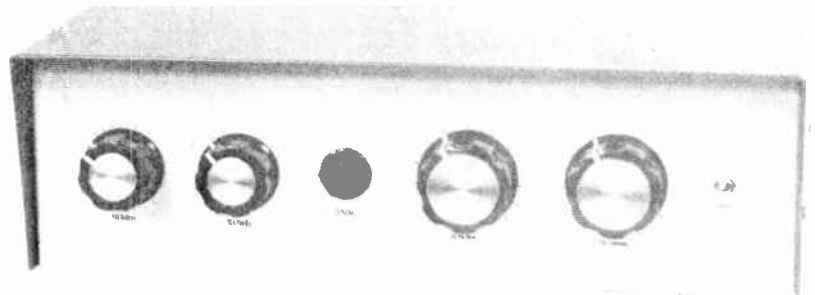
A Short-Wave band receiver of the direct conversion type operating over the 80 metre (3.5 – 3.8MHz) band. Uncomplicated and simple to construct, this relatively cheap unit proves you don't have to have a battery of sophisticated and expensive equipment for short-wave listening. Ideal for budding short-wave enthusiasts and those wanting to explore the possibilities before getting further involved in the subject. Operates in Single Sideband and CW modes, and can be aligned without any special test gear. Uses the two special SW RF coils to be found in the Wound Components section of this Catalogue.

The following items are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB59P (80m Dir Con Rx PCB) £2.95



Kit

Complete receiver kit, not including case, fittings and batteries.

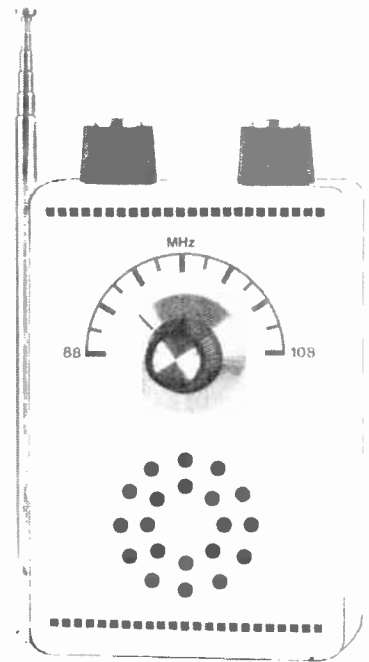
Order

LK41U (80m Conv Rx Kit) £18.95

Construction Details

Full constructional details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

FM RADIO



A VHF FM radio which uses the TDA 7000 IC, which can be described as being a complete FM receiver on a chip. The IC merely requires two coils, only one of which is a tuned circuit, and a number of small peripheral components, to form the basis of a simple and easily constructed portable FM receiver. The completed project comes with power amp IC and speaker. Good performance can be achieved, although co-channel interference can be a problem if stations are densely packed. Notwithstanding, the FM radio contains a number of features that may be expected of more complex receivers, including IF limiting, AGC, audio mute, and the use of a quadrature detector circuit. Maximum distortion from the audio output is some 2.3% THD, for a received station maximum deviation of ± 75 kHz. Audio output with an 8 ohm speaker is 300mW.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB50E (TDA 7000 Radio PCB) £2.45

Kit

A complete kit of parts is available, excluding the case, aerial, battery holder and clips.

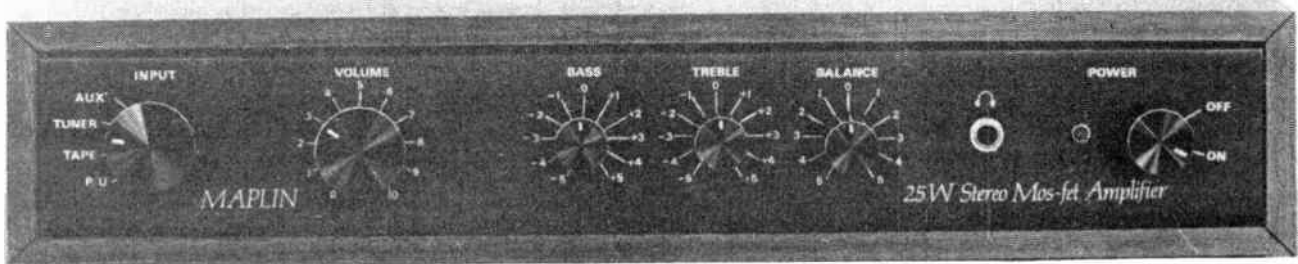
Order

LK32K (TDA 7000 Radio Kit) £11.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

25W STEREO MOSFET AMPLIFIER



- ★ 25W per channel rms with power MOSFET output
- ★ Very easy to build — only 7 interconnecting wires
- ★ Extremely low total harmonic distortion
- ★ Extremely low noise
- ★ High efficiency toroidal transformer
- ★ Complete kit includes wooden cabinet & chassis
- ★ No setting-up required
- ★ All components except 5 mount directly onto main pcb

One of the most popular projects we have ever produced is the MOSFET amplifier described in the June 1981 issue of 'Electronics and Music Maker'. Its popularity is doubtless due to the virtues of the MOSFET transistors — as the article says: they are "virtually bomb-proof — like the best valve amps". For reliability, freedom from thermal runaway and extremely low harmonic distortion there's nothing to touch the MOSFET transistor for audio power output stages. As well as offering these essential advantages, this stereo amplifier has been carefully designed for absolute ease of construction; this in its turn adding to the reliability and repeatable quality for all constructors. All the components bar five, mount directly on to the main pcb and only seven interconnecting wires are required and they are for the headphone socket and LED. The inputs and outputs are on pcb mounting DIN sockets and provision has been made on the pcb for connecting a graphic equaliser, though you will need to drill the rear panel to make connection. Otherwise the kit contains everything you need including a punched chassis finished in matt black with legends printed on the front and rear panels. A wooden cabinet is also supplied which has to be glued together with a woodworker's PVA adhesive (e.g. Resin W) and this glue is not supplied in the kit. No setting-up is required. If the building instructions are carefully followed then the amplifier will work as soon as it is switched on. However, a preset is provided for each input (except auxiliary) which can be adjusted if desired, so that when switching between inputs, the volume control does not have to be altered to keep the output volume constant. In addition, a remote control unit for volume, bass and treble and balance is available.

Specification of prototype

Input sensitivities for max. output (with preset adjusted to max. sensitivity):

Magnetic pick-up input	2mV at 68k
Tape input	50mV at 1k2
Tuner input	50mV at 1k2
Auxiliary input	50mV at 1k2
Magnetic pick-up input overload threshold	40mV
Tape output at rated input	100mV into 100k

Power output: >26W per channel rms into 8Ω or 4Ω continuous at 1kHz both channels driven.

Total harmonic distortion: Better than 0.075% at 1kHz at >25W output.

Frequency response: 20Hz to 40kHz ±1dB (from magnetic pick-up input ±1dB from RIAA).

Signal to noise: Better than 60dB on magnetic pick-up input.
Better than 80dB on all other inputs.

Channel separation: Better than 40dB

Bass control: ±14dB boost and cut at 100Hz.

Treble control: ±8dB boost and cut at 10kHz.

Balance control: -50dB to +15dB.

The following parts used in this project are not described elsewhere in this catalogue.

Heatsink

Order

RK25C (Stereo Amp Heatsink) £1.30

Woodwork

A wrap-round teak-finish cabinet.

Order

XG16S (Stereo Amp Woodwork) £9.95

Chassis

A complete chassis, fully punched and with front and rear panels printed in white on matt black.

Order

XG15R (Stereo Amp Chassis) £5.95

Printed Circuit Boards

Order

GA71N (Stereo Amp PCB) £6.95
GA78K (Stereo Amp Sw PCB) 45p

Kit

A complete kit of all the parts you need including chassis and woodwork is available.

Order

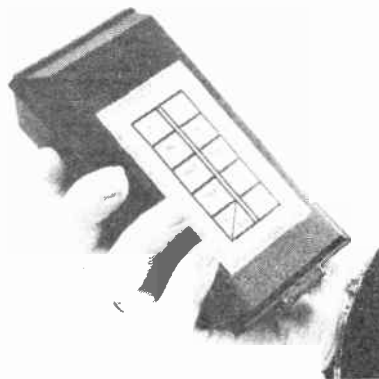
LW71N (25W Stereo Amp Kit) £69.95

Construction Details

Full construction details may be found in the Maplin Projects Book 3. See inside back cover of this catalogue.

REMOTE CONTROL FOR AMPLIFIERS

Over recent years infra-red control has greatly increased in popularity, as is evident by the plethora of televisions and video cassette recorders fitted with this facility. Some hi-fi systems do incorporate remote control, but not very many which is regrettable because sound level and balance settings are dictated by listening position in relation to the loudspeakers. This hi-fi controller project gives the user total control over adjustment of volume and speaker balance settings, also bass and treble cut and boost. All operations are performed by pressing an appropriate button on the hand-held control transmitter. The selected parameter can then be either stepped by a single shot or automatically swept by holding the button down. Two further controls allow for return from remote to local (or vice versa), and an instant flat setting of speaker balance and tone response. Designed for use with our 25W Stereo MOSFET Amplifier.



The following parts are not described elsewhere in this catalogue.

Switch Panel

A flexible printed plastic panel for use with our switch contact sheet.

Order

RK36P (Switch Panel) £1.75

Printed Circuit Boards

Order

GA97F (Stereo Amp IR Decoder) £2.95
GA99H (Stereo Amp IR Controller) £1.30

Kit

A complete kit of all the parts needed to build the Encoder and Decoder (except the battery) is available.

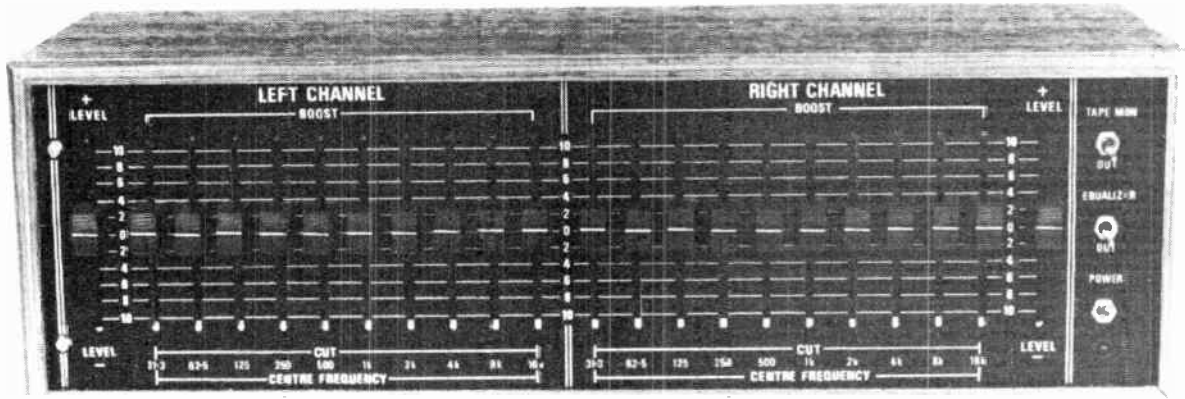
Order

LW77J (Amp Remote Control Kit) £29.95

Construction Details

Full construction details may be found in the Maplin Projects Book 4. See inside back cover of this catalogue.

TEN CHANNEL STEREO GRAPHIC EQUALISER



A really superior quality Graphic Equaliser with ten controls per channel making a total of twenty plus two overall volume controls. The design avoids the need for complicated coils and also makes use of a special op-amp designed for use in audio circuits and featuring a very low noise input specification that puts this unit solidly into the top-flight hi-fi class.

Specification

Control centre frequencies: 31.3Hz, 62.5Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz, 16kHz.
 Frequency response: (Controls flat): 10Hz to 20kHz $\pm 1/2$ dB
 Range of filter controls: ± 13 dB
 Distortion (2V out, controls flat): 0.02% typical
 Signal to noise ratio: (2V out, controls flat): 82dB

PCB, Metalwork and Construction Details

A ready printed and punched chassis with front and rear panel finished in semi-gloss black and printed in white. The wooden surround shown in the picture is no longer available. Full construction details are given in our leaflet MES 37 complete with component schedule.

Order

XX03D	(10-Channel G.E. PCB)	£1.95
XB74R	(10-Chl Eqlsr Mtwrk)	£12.95
XH21X	(MES37)	25pNV

PRE-AMPLIFIER CIRCUITS

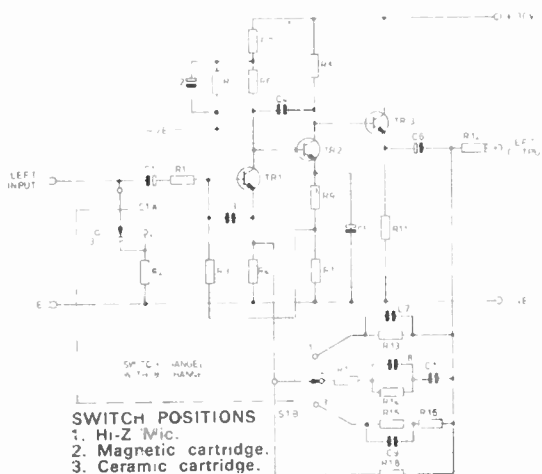
A range of very high fidelity pre-amp circuits for high quality audio applications. For a volume control connect the output of the input circuit across a 10k log pot and connect the slider via a Min Res 20k to the output of a mixer amp, along with as many other input circuits as you wish. The 20k resistors will mix all the inputs together. We recommend the use of our "Low Noise Screened" cable (XR18U) for all interconnections.

Important Note

Most of the following circuits are being revised and updated in a new series starting in the Maplin Magazine Issue 17 on sale from November 1985. Kits and ready-built modules will be available.

Cartridge or High Impedance Microphone Circuit

The circuit diagram is shown for one channel, but the pcb contains two identical parts for stereo. This input amp is suitable for ceramic or magnetic cartridge or high impedance microphone. Right hand channel components are denoted by the prefix 10.



Parts List

R1, R101	Min Res 1k	R7, R107	Min Res 47k
R2, R102	Min Res 82k	R8, R108	Min Res 22k
R3, R103	Min Res 220k	R9, R109	Min Res 1k8
R4, R104	Min Res 510R	R10, R1010	Min Res 1k2
R5, R105	Min Res 12k	R11, R1011	Min Res 3k3
R6, R106	Min Res 100k	R12, R1012	Min Res 47R

Specification

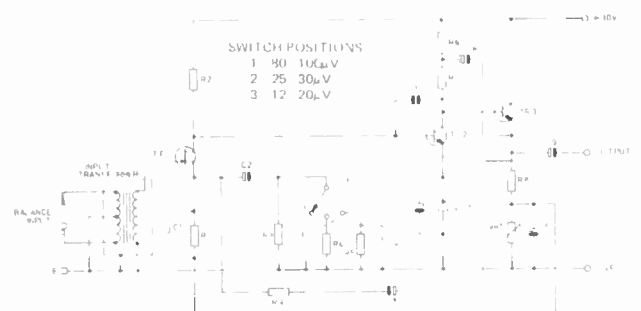
Sensitivity: Magnetic cartridge: 4mV at 47k Ω
 Ceramic cartridge: 80mV at 100k Ω
 High impedance microphone: 10mV at 47k Ω
 Signal to noise ratio: Better than 100dB
 Distortion: <0.01%
 Frequency response: Better than -3dB (20Hz to 20kHz)

Order

LR13P	(HQ Mixer PCB No.2)	£2.25
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Low Impedance Microphone Circuit

This input amp is suitable for use with balanced and unbalanced low impedance microphones where extremely high quality and low noise are the criteria. For unbalanced microphones connect one end of the primary of the input transformer to earth and leave the centre tap unconnected. The pcb is mono only.



Parts List

R1	Min Res 470R	C5	Axial 47 μ F 10V
R2	Min Res 100k	C6	Axial 680 μ F 6.3V
R3	Min Res 2k2	C7	Axial 6.8 μ F 40V
R4	Min Res 470R	C8	Axial 1 μ F 63V
R5	Min Res 82R	C9	Axial 15 μ F 63V
R6	Min Res 15k	C10	Ceramic 4.7pF
R7	Min Res 15k	VR1	Vert S-Min Preset 4k7
R8	Min Res 3k3	TR1	2N3819
R9	Min Res 22k	TR2	2N3707
C1	Not used	TR3	BC107B
C2	Axial 100 μ F 10V	S1	Rotary SW3
C3	Not used	ZD1	BZY88C6V2
C4	Not used		Input transformer: Mic Transformer Type 2

Specification

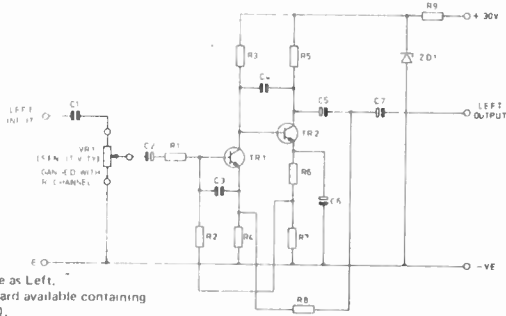
Sensitivity: Switch position 3: 12 to 20 μ V
 Switch position 2: 25 to 30 μ V
 Switch position 1: 80 to 100 μ V
 Signal to noise ratio: Better than 100dB
 Distortion: <0.01%
 Frequency response: Better than -3dB (20Hz to 20kHz)

Order

LR14Q (HQ Mixer PCB No.3) £1.95

General Purpose Input Circuit

This input amp is suitable for use with any previously amplified signal or electronic musical instruments, electric guitar etc. and acts as a buffer and level matcher.



Right channel same as Left.
 (For Mono use, board available containing only L.H. channel).

Parts List

R1, R101	Min Res 1k	C2, C102	Axial 1 μ F 63V
R2, R102	Min Res 220k	C3, C103	Polystyrene 100pF
R3, R103	Min Res 180k	C4, C104	Ceramic 18pF
R4, R104	Min Res 2k2	C5, C105	Axial 10 μ F 25V
R5, R105	Min Res 5k6	C6, C106	Axial 68 μ F 16V
R6, R106	Min Res 470R	C7, C107	Axial 2.2 μ F 63V
R7, R107	Min Res 680R	VR1, VR101	Pot Dual Log 100k
R8, R108	Min Res 15k	TR1, TR101	BC109C
R9	Std Res 820R	TR2, TR102	BC109C
C1, C101	Polyester 0.47 μ F	ZD1	BZY88C9V1

Specification

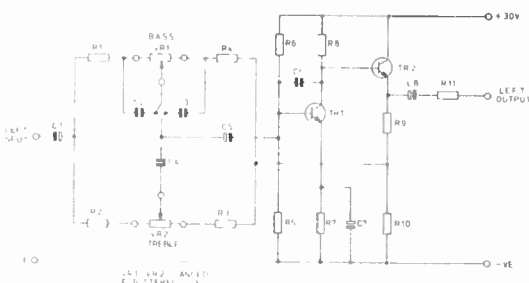
Sensitivity: Variable from 30mV at 33k Ω . Signal to noise ratio: Better than 110dB.
 Distortion: <0.01%. Frequency response: Better than -1dB (20Hz to 20kHz).
 Boards are available for mono or stereo. For the stereo board, the extra parts required for the right channel are denoted by the prefix 10. Mono board is LR15R. Stereo board is LR34M.

Order

LR15R (HQ Mixer PCB No.4) £1.95
 LR34M (HQ Mixer PCB No.24) £2.45

Tone Control Circuit

This circuit may be connected directly to the output of any input circuit shown, and the volume control should then be connected across the output of this circuit.



Parts List

R1, R101	Min Res 47k	C1, C101	Axial 2.2 μ F 63V
R2, R102	Min Res 3k3	C2, C102	Polystyrene 6800pF
R3, R103	Min Res 3k3	C3, C103	Polystyrene 6800pF
R4, R104	Min Res 47k	C4, C104	Polystyrene 1500pF
R5, R105	Min Res 100k	C5, C105	Axial 2.2 μ F 63V
R6, R106	Min Res 300k	C6, C106	Polystyrene 10pF
R7, R107	Min Res 100k	C7, C107	Axial 22 μ F 63V
R8, R108	Min Res 220k	C8, C108	Axial 10 μ F 63V
R9, R109	Min Res 2k2	VR1, VR101	Pot Dual Lin 500k
R10, R1010	Min Res 10k	VR2, VR102	Pot Dual Lin 100k
R11, R1011	Min Res 1k	TR1, TR101	BC107B
		TR2, TR102	BC107B

Specification

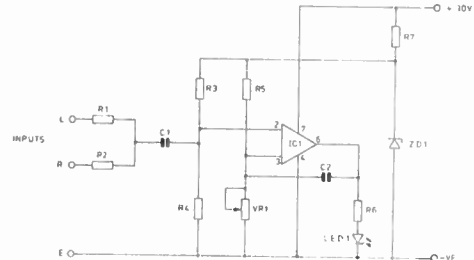
Bass response: \pm 18dB. Treble response: \pm 16dB. Boards are available for mono or stereo. For the stereo board, the additional parts required for the right hand channel are denoted by the prefix 10. Mono board is LR16S. Stereo is LR35Q.

Order

LR16S (HQ Mixer PCB No.5) £1.30
 LR35Q (HQ Mixer PCB No.25) £2.25

Peak Overload Detector Circuit

This board may be connected to the output of any input circuit (or tone control if used) and adjusted so that the LED just lights up when distortion is heard. This can be achieved by connecting an adjustable signal with a higher level than would normally be connected. For mono use, omit R2 and connect to 'L'.



Parts List

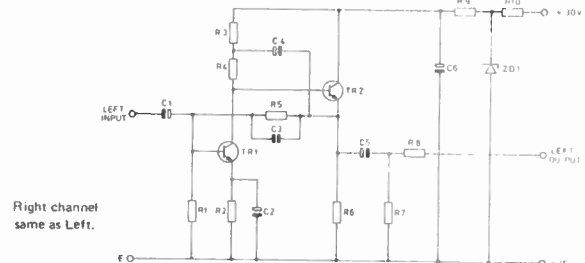
R1	Min Res 56k	R7	Min Res 4k7
R2	Min Res 56k	C1	Polyester 0.47 μ F
R3	Min Res 150k	C2	Polyester 0.1 μ F
R4	Min Res 100k	VR1	Vert S-Min Preset 100k
R5	Min Res 100k	IC1	μ A741C 8-pin
R6	Min Res 2k2	ZD	BZY88C6V2
		LED	Red

Order

LR21X (HQ Mixer PCB No.6) £1.45

Mixer Amp Circuit

Any number of input circuits may be connected each via its own Min 20k resistor to the input of this circuit. The output of this circuit may be fed to a power amplifier, tape recorder etc. or if a master volume control is required, connect the output across a 10k log pot and connect the slider to the input of a line amp or filter unit. The circuit diagram is shown for one channel, but the pcb contains two identical parts for stereo. Right-hand channel components are denoted by the prefix 10.



Right channel same as Left.

Parts List

R1, R101	Min Res 22k	R10	Min Res 820R
R2, R102	Min Res 33k	C1, C101	Tant 100 μ F 3V
R3, R103	Min Res 33k	C2, C102	Axial 15 μ F 16V
R4, R104	Min Res 68k	C3, C103	Ceramic 47pF
R5, R105	Min Res 68k	C4, C104	Axial 2.2 μ F 63V
R6, R106	Min Res 5k6	C5, C105	Axial 6.8 μ F 40V
R7, R107	Min Res 15k	C6, C106	Axial 150 μ F 25V
R8, R108	Min Res 33R	TR1, TR101	BC109C
R9, R109	Min Res 68R	TR2, TR102	BC109C
		ZD1	BZY88C18V

Specification

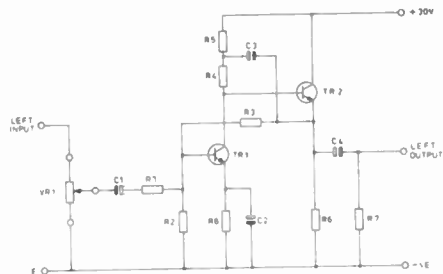
Signal to noise ratio: Better than 110dB. Distortion: <0.01%.
 Frequency response: Better than -1dB (20Hz to 20kHz).

Order

LR22Y (HQ Mixer PCB No.7) £2.25

Line Amp Circuit

The output of a mixer amp or fader unit may be connected to this circuit and the output may then be fed to a power amplifier or tape recorder etc. The circuit diagram is shown for one channel, but the pcb contains two identical parts for stereo. Right-hand channel components are denoted by the prefix 10.



Parts List

R1, R101	Min Res 22k	R8, R108	Min Res 12k
R2, R102	Min Res 33k	C1, C101	Axial 1µF 63V
R3, R103	Min Res 220k	C2, C102	Axial 47µF 10V
R4, R104	Min Res 68k	C3, C103	Axial 6.8µF 40V
R5, R105	Min Res 33k	C4, C104	Axial 22µF 25V
R6, R106	Min Res 2k2	VR1, VR101	Vert S-Min Preset 22k
R7, R107	Min Res 15k	TR1, TR101	2N3707
		TR2, TR102	BC107B

Specification

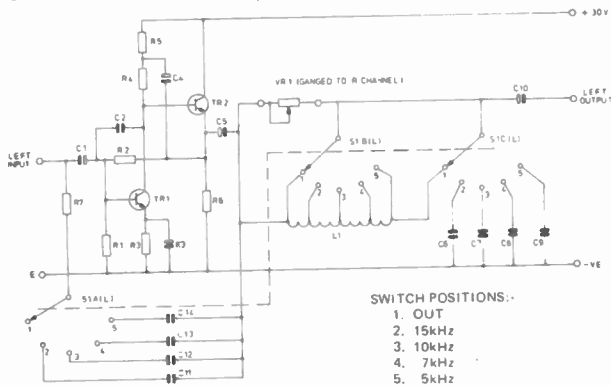
Signal to noise ratio:	Better than 110dB
Distortion:	<0.01%
Frequency response:	Better than -1dB (20Hz to 20kHz)

Order

LR23A (HQ Mixer PCB No.8) £1.95

Filter Unit Circuit

This circuit may be connected between a mixer amp and a line amp to provide overall equalisation. The circuit is built on two small pcb's that fix one above the other. Each board contains a stereo circuit so both boards are required even if you only require mono. The circuit is shown for one channel, but the additional parts required for stereo are shown in the parts list denoted by the prefix 10.



- SWITCH POSITIONS:-
1. OUT
 2. 15kHz
 3. 10kHz
 4. 7kHz
 5. 5kHz

Parts List

R1, R101	Min Res 100k	C8, C108	Polystyrene 3300pF
R2, R102	Min Res 220k	C9, C109	Polystyrene 4700pF
R3, R103	Min Res 22k	C10, C1010	Axial 10µF 63V
R4, R104	Min Res 27k	C11, C1011	Polystyrene 47pF
R5, R105	Min Res 27k	C12, C1012	Polystyrene 100pF
R6, R106	Min Res 3k3	C13, C1013	Polystyrene 150pF
R7, R107	Min Res 4k7	C14, C1014	Polystyrene 220pF
C1, C101	Axial 1µF 63V	VR1, VR101	Pot Dual Log 500k
C2, C102	Polystyrene 10pF	VR2, VR102	Vert S-Min Preset 10k
C3, C103	Axial 22µF 25V	TR1, TR101	BC107B
C4, C104	Axial 4.7µF 63V	TR2, TR102	BC107B
C5, C105	Axial 1µF 63V	L1, L101	Mixer Pot Core
C6, C106	Polystyrene 1500pF	S1	Maka Shaft and 3 Maka
C7, C107	Polystyrene 2200pF		Wafer 2 pole 5 way

Specification

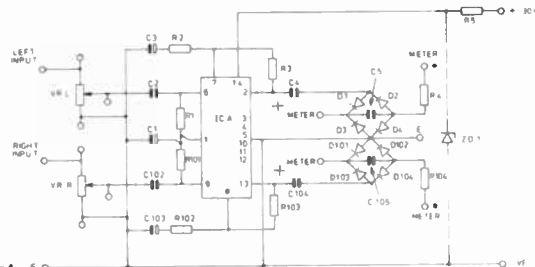
Switch in "Out" position: flat response. With roll-off control at minimum the response will fall off at 6dB per octave from the selected frequency: 5kHz, 7kHz, 10kHz or 15kHz. Roll-off control may be adjusted to give any roll-off between 6dB and 18dB per octave. The upper pcb is PCB No. 9 and the lower is PCB No. 29.

Order

LR24B (HQ Mixer PCB No.9) £2.25
LR42V (HQ Mixer PCB No.29) £3.95

VU and Monitor Amp Circuit

This circuit may be connected directly across the main output or on the input of a line amp if fitted. If both VU and monitor are required, two circuit boards will be required, both connected at the same point. The board may be configured either for the VU circuit or as a monitor amp. Right-hand channel components are denoted by the prefix 10. The VU meter circuit is shown for PPM metering. For peak VU metering omit C5(C105). (PPM is an indication of the peak programme load in the whole group of signals, rather than an instantaneous reading as is VU.)



Parts List

R1, R101	Min Res 1M		
R2, R102	Min Res 2k2		
R3, R103	Min Res 100k		
R4, R104	Min Res 6k8		
(where fitted) R5	1W Res 390R		
C1	Axial 220µF 16V		
C2, C102	Carbonate 0.0047µF		
C3, C103	Axial 4.7µF 63V		
C4, C104	Axial 220µF 16V		
C5, C105	(where fitted) Axial 4.7µF 63V.		
	(Positive to junction of D1, D3/D101, D103)		
VRL, VRR	Hor S-Min Preset 100k		
	(Pot Dual Log 22k for monitor use).		

D1, D101		IC1	LM377
D2, D102	(where fitted) OA47	ZD1	BZX61C15V
D3, D103			
D4, D104		2	VU Meter V41

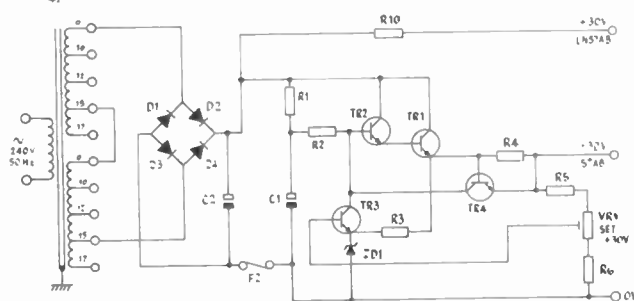
Note: When used as a monitor amp, D1 to D4, D101 to D104, R4, R104 and C5, C105 are omitted and the positions for D2, D104, R4 and R104 have a wire link inserted. This enables medium impedance (200 to 600Ω) headphones to be used. If it is desired to use low impedance (8Ω) headphones then the links in place of R4, R104 should be replaced with Min Res 470Ω resistors.

Order

LR25C (HQ Mixer PCB No.10) £2.25

Power Supply Circuit

The circuit shown will supply 1A at 30V stabilised. TR1 should be bolted to a metal chassis or heatsink using a Kit TO3 and Thernpath close to the pcb. If a monitor amp or VU meter circuit is used you will require R10 which should be connected to C2, otherwise R10 and the un stabilised 30V line are not required.



Parts List

R1	Min Res 3k9	TR1	2N3055
R2	Min Res 470R	TR2	2N3053
R3	Min Res 3k3	TR3	BC107B
R4	W/W Min 0.47R	TR4	BC107B
R5	Min Res 1k8	ZD1	BZY88C9V1
R6	Min Res 1k	D1 to D4	Bridge S005
R10	Std Res 100R if required	T1	Tr 34V 1A
C1	Axial 100µF 63V	F2	Fuse A/S 2A
C2	Axial 2200µF 63V	1	Kit TO3
VR1	Vert S-Min Preset 2k2	1	Clip-on Heatsink

The pcb does not hold the components D1 to D4, TR1, C2 and R10.

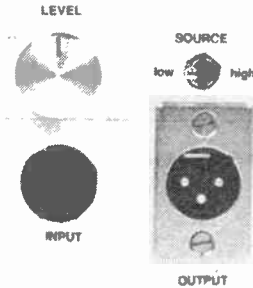
Order

LR26D (HQ Mixer PCB No.14) £2.25

DIRECT INJECT BOX

DI BOX

E&MM



The Direct Inject Box (D.I. Box) allows the signal from an amplified instrument to be fed directly into a balanced line mixing desk, and as such is invaluable on stage, and in the home or professional recording studio avoiding many of the disadvantages of using a microphone. It's much cheaper to build the D.I. Box than to buy a good microphone, and it eliminates acoustic feedback and 'spillover' of other sounds into the instrument channel.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

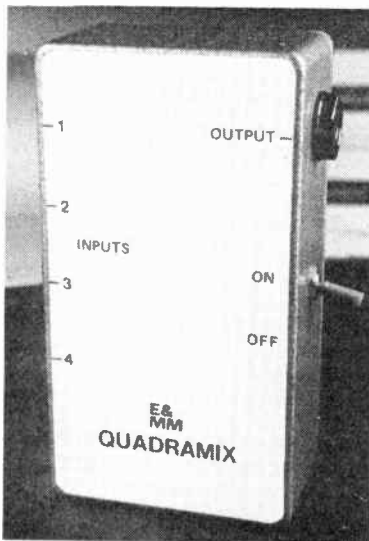
GA00A (D.I.Box PCB) 98p

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

QUADRAMIX

Most mixer designs are fairly complex and expensive to construct, but have a great many useful facilities and features. However, there are occasions when the most basic of mixers is all that is needed, with a gain control at each input not even being necessary and an example of such a situation would be when using a few of Maplin's very popular Syntom, Synwave and Hexadrum projects, with the outputs fed into a single amplifier. The relative output levels of the effects units could be adjusted using the output level control on each of these sound making projects, and all that is needed is a basic mixer circuit to combine the four outputs and prevent any interaction between the output level controls.



The Quadramix is a basic four-into-one mixer which has unity voltage gain from each input to the output. The input impedance is 100k on all four inputs and the output impedance is low so that the unit also acts as a buffer amplifier. The noise level of the circuit is too low to be of any consequence, as is the distortion level, provided the input signal is kept below the clipping threshold of approximately 6 volts peak to peak — more than enough for most musical instrument outputs. Power is provided by a PP3 size 9V battery which has an extremely long life since the current drain of the circuit is only about 2mA.

The following parts are not described elsewhere in this catalogue.

Printed Circuit Board

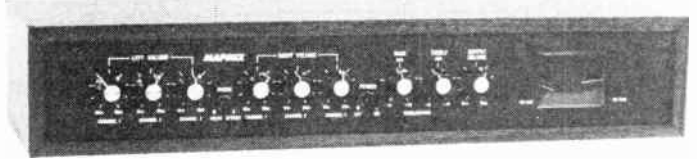
Order

GA68Y (Quadramix PCB) 95p

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

MAPMIX SIX CHANNEL AUDIO MIXER



A three-way stereo or six-way mono mixer with added bass and treble controls, twin VU meters and master volume control. Inputs and outputs are via standard 1/4 inch jack sockets. The mixer is powered by a PP3 battery (current consumption is a mere 1.75mA), or from an external source via a 2.1mm power socket up to 13.5V DC max. An optional metal case for the Mapmix and a Printed Front Panel are also available.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB60Q (Mapmix PCB) £6.95

Pre Drilled and Punched Case

Order

XG38R (Mapmix Case) £9.95

Printed Front Panel

Order

FJ36P (Mapmix Front Panel) £2.95

Kit

A complete kit of all parts except case and front panel.

Order

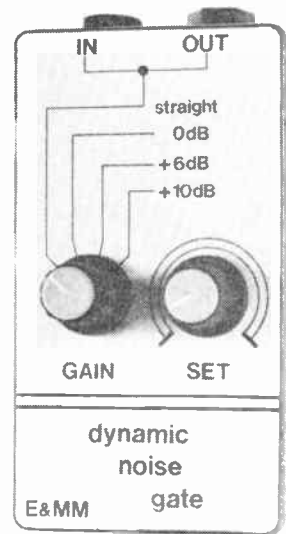
LK49D (Mapmix Kit) £34.95

Construction Details

Full construction details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

NOISE GATE

This useful project has the following features: Provides automatic shutdown of unwanted noise during 'pause' conditions. Compander technique eliminates 'signal snapping'. User adjustable characteristics for high or low level network insertion. Allows the use of otherwise 'too noisy to use' effects units. Can effectively cancel crosstalk in multi-microphone set-ups. Can be used in multi-instrument layouts for instant unit shutdown on changeovers. Will eliminate 'beehiving' in older type 'spaghetti' wired organs. No circuit trimming required or tight specification devices used. Can be used in its own right as an effect to create soft attack bowing characteristic. Uses only two low-cost and readily available IC's. Self contained, jack-in jack-out unit allows instant in-line connection.



The following parts are not described elsewhere in this catalogue.

Printed Circuit Board and Kit

Complete kit of all parts excluding the case.

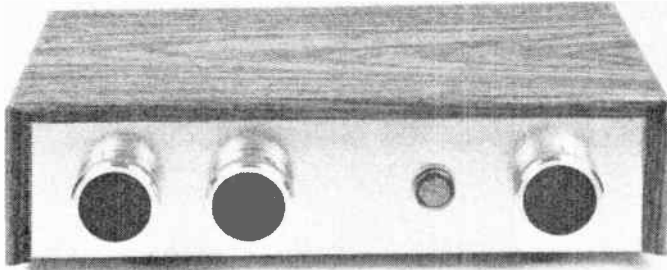
Order

GA43W (Noise Gate PCB) £1.30
LK43W (Noise Gate Kit) £9.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

TUNABLE SCRATCH FILTER



- ★Electronic 'Renovation' Of Worn Or Dusty Records
- ★Reduces Scratch And Surface Noise
- ★Can Be Used On Tuners And Cassette Decks

This easy to construct device will remove the annoying clicks and surface noises from worn and dusty records. A special "switched capacitor filter" IC allows easy adjustment to "tune" out the unwanted sound for optimum subjective results. Can also be used to good effect with FM tuners, noisy cassettes etc.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB13P (Tnbl Scrch Filtr PCB) £2.95

Kit

A complete kit of parts (excluding case) is available.

Order

LK04E (Tnbl Scrch Filtr Kit) £25.95

Construction Details

Full construction details may be found in the Maplin Projects Book 6. See inside back cover of this catalogue.

NOISE REDUCTION UNIT MKII



This is an improved version of the Noise Reduction system that appeared in The Best of E & MM Projects Volume 1. It is a Noise Reduction system for tape recorders, and cassette decks in particular. It works on a principle that is similar to the Dolby system, where music material is 'encoded' during recording and 'decoded' on playback, producing an improved treble content, better dynamic range and much reduced background tape noise. This low distortion, hi-fi quality unit provides for a signal to noise ratio of -80dB, and a dynamic range capability approaching that of the human ear of 100dB, normally almost impossible to achieve with magnetic tape excluding professional quality (and very expensive) recording studio equipment. The unit includes LED peak level indicators for optimum level matching for best results. Comprises 2 channel stereo record and playback circuits. A case and printed front panel are available separately.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Two Comander pcb's are required for stereo.

Order

GA30H (Comander PCB) £2.95
GA31J (Comander PSU PCB) £1.95

Case

Order

XG37S (Mk N/R Unit Case) £9.95

Printed Front Panel

Order

FJ35Q (Mk II N/R Front - Pan) £1.95

Kit

A kit of parts for a stereo unit excluding case and front panel.

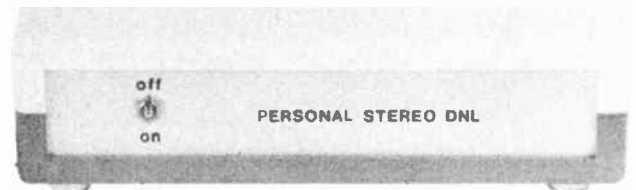
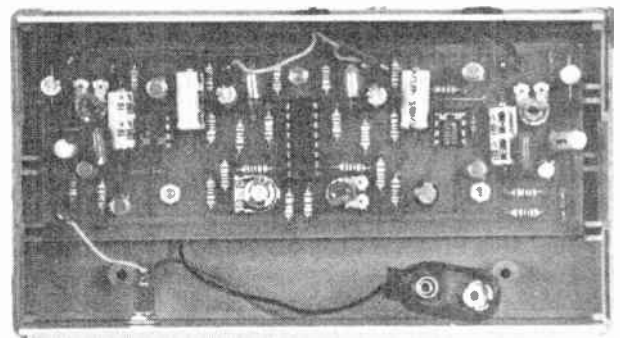
Order

LK38R (Mk II N/R Unit Kit) £39.95

Construction Details

Full construction details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

PERSONAL STEREO DNL



A battery operated Dynamic Noise Limiter for use with Personal Cassette Players. Although most modern Personal Stereo Cassette Players have a creditable quality of sound, they generally lack the sort of noise reduction facilities that come standard with the average reasonably good quality cassette recorder in the home. Even the provision of a tone switch doesn't really help, since a fair proportion of the treble content of the recording is lost even from Dolby encoded tapes. An established method of reducing background tape noise to a level where it shouldn't be heard, is that of the Dynamic Noise Limiter. The DNL is a form of Automatic Gain Control circuit which substantially attenuates the tape signal below a minimum threshold, which is chosen as the smallest music signal. This high quality circuit employs one of the recently developed OTA (Operational Transconductance Amplifier) IC's, used in this application as a voltage controlled filter, governed by the audio signal level. As is usual with DNL's the filter is of the low pass variety. The Personal Stereo DNL connects between the cassette player and the headphones, and is powered by a PP3 9V battery.

A printed circuit board for this project is available or a complete kit excluding the case.

Printed Circuit Board

Order

GB44X (Stereo DNL PCB) £1.95

Kit

Complete kit excluding the case.

Order

LK27E (Personal Stereo DNL) £9.95

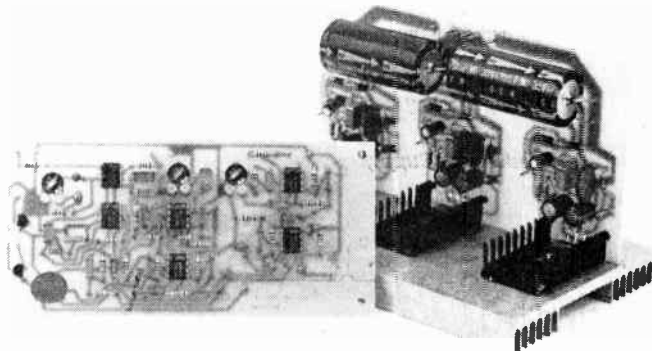
Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

ACTIVE CROSSOVER

- ★ Cross-Over Frequencies at 650Hz & 4kHz
- ★ Bass, Middle & Treble Channel Outputs
- ★ 12dB/Octave Slope Characteristics

NEW



Very few loudspeakers are capable of handling the full audio range of frequencies, and continue to give maximum output efficiency at the same time. Indeed, it is not always desirable to rely on just a single loudspeaker system, especially if cabinet design and directional effects are taken into consideration. Many hi-fi speaker systems incorporate three loudspeakers; a large 'Woofer', for handling low frequency bass signals, a smaller 'Squawker' for mid-range frequencies, and an even smaller 'Tweeter' for the high frequency signals. Each speaker is then driven from an amplifier via a network of filters, called a cross-over, which divides the composite audio input signal into three distinct frequency bands one for each driver unit. The Active Cross-Over Module does this electronically, providing more precise control over the frequency bands presented to each of the three loudspeakers. This active filter is not capable of driving loudspeakers directly, and so a power amplifier, one for each channel, must be provided between the filter outputs and each of the three speakers. The Cross-Over has a maximum gain of 0dB, and the crossover response is 2nd order type or 12dB/octave. The module requires a regulated supply of +15V/0V/-15V DC.

All of the Maplin range of amplifier kits are suitable for use with the cross-over. The module itself is not a pre-amp and will not amplify signals connected to it, and is in essence, a frequency dependent attenuator, although pass band output levels will be similar to applied input levels, which should not exceed 2.25V rms, and should ideally be 0dB or 0.775V rms.

The module could be fitted in a speaker cabinet, for instance, along with power supplies and output amplifiers and driven from a hi-fi system. Either preamp or speaker outputs could be connected to the module input.

The following items do not appear elsewhere in this catalogue.

Printed Circuit Board

Order

GB82D (Active Crossover PCB) £4.75

Kit

A complete kit of parts to build the Active Cross-Over is available.

Order

LK69A (Active Crssvr Kit) £17.95

3 Channel Amplifier

NEW

A design based on the TDA2030 IC and especially developed for use with the Active Cross-Over described above. Each amplifier uses dual supply rails, which enables loudspeakers to be wired directly to the amplifier outputs without the need for bulky DC decoupling capacitors.

Three identical amplifier stages are available on the PCB, any of which can be used for bass, middle or treble frequencies.

Specification:

- Min PSU: ±4.5V DC (@ 5VA)
- Max PSU: ±18.5V DC (@ 50VA)
- Max Power into 8Ω: 10 Watts/Channel
- Full Power Bandwidth: 25Hz - 40kHz ±1dB
- T.H.D.: 0.1% (@ 1kHz)
- Max Input Signal: 300mV RMS
- before Clipping: (0.85V peak-to-peak)
- Input: 10kΩ
- Impedance O/P Load: >4Ω (Typically 8Ω)

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GB91Y (3 Channel Amp PCB) £4.95

Kit

A complete kit of all parts (excluding silicone grease) for the 3 Channel Amplifier is available.

Order

LK70M (3 Channel Amp Kit) £19.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 15. See inside back cover of this catalogue.

GUITAR BUDDY PRACTICE AMPLIFIER

NEW



A small practice amplifier in kit form for guitarists. This neat, well designed unit will produce a 2.5W output from an integral 4" diameter speaker, or alternatively to a pair of headphones via a 1/4in. jack socket to exclude other people or extraneous noise. Input is via two paralleled 1/4in. mono jack sockets. Volume and tone controls are provided and a 3.5mm jack socket for connection to an external 9-12V DC supply, in addition to the internal battery (PP9 size). Complete with custom injection moulded black plastic case. Dimensions 200mm wide x 120mm deep x 230mm high. Weight 950 grammes less battery. Supplied with instructions.

A complete kit of everything required excluding PP9 size battery is available.

Order

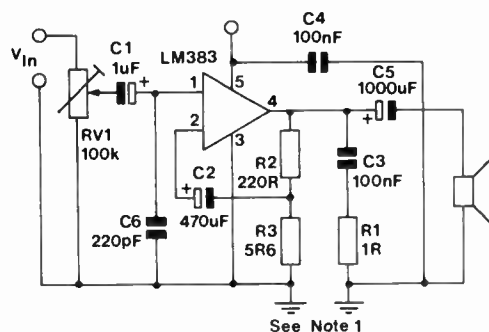
XG67X (Guitar Buddy Kit) £19.95

8W POWER AMPLIFIER



A hi-fi 8W amplifier using the LM383. One of our most popular kits, this amp is offered at a very low price and is an ideal building-block module for use in many audio projects. For more details see the specification of the LM383 in the Semiconductor Section of this catalogue.

Note 1: These earths should be connected by two separate wires to the Earth Common on the power supply e.g. the negative wire of the 470µF capacitor.

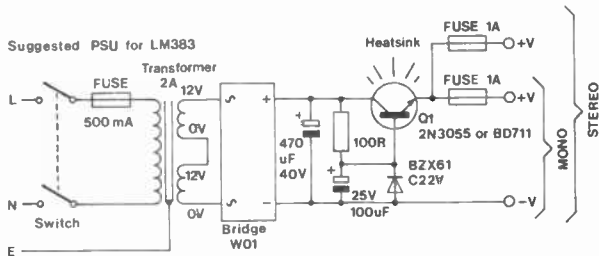


See Note 1

Parts List

- | | | | |
|-----|-----------------------|------|---------------------------|
| R1 | Min Res 1Ω | C2 | PC Elect 470µF 16V |
| R2 | Min Res 220Ω | C3,4 | Polyester 0.1µF |
| R3 | Econ Res 5.6Ω | C5 | PC Elect 1000µF 16V |
| RV1 | Hor S-Min Preset 100k | C6 | Ceramic 220pF |
| C1 | PC Elect 1µF 100V | 1 | 8W Hi-Fi Heatsink (HQ81C) |

Power Supply



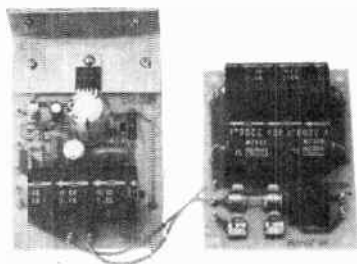
Printed Circuit Board

Order
BY73Q (8W Amp PCB) **78p**

Kit
 A complete kit of all the parts needed to build this amplifier is offered at a very competitive price.

Order
LW36P (8W Amp Kit) **£4.95**

15W POWER AMPLIFIER

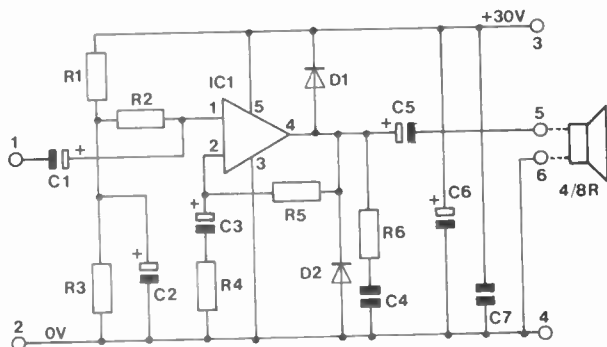


A hi-fi 15W amplifier using the TDA 2030 IC described in the Semiconductor Section of this catalogue. This project is available as a kit and also as a ready-built and tested complete module requiring just a power supply and speaker. All versions of this popular and excellent quality amplifier are offered at very competitive prices.

Specification

Supply voltage with no signal:	36V absolute maximum
At full power:	24V min. (for 14W in 4Ω): 30V max.
Supply current at 14W, 4Ω:	900mA
at 10W, 8Ω:	500mA
with no signal:	30mA
Short circuit duration:	Continuous
Thermal characteristics:	Shuts down at 110°C (case temp.)
Total harmonic distortion:	0.1% (0.1W to 10W)
	<5% (10W to 14W)
Input sensitivity:	250mV for full power out
Frequency response:	10Hz to 140kHz (-3dB)

The heatsink bracket must be bolted to a metal chassis or to a heatsink such as Heatsink 4Y (FL41U). The IC should be bolted directly to the heatsink bracket as the tab is electrically isolated after smearing with Thermpath (not supplied in the kit).



List of Parts in Kit

R1,2,3	Min Res 100k	C6	PC Elect 100µF 63V
R4	Min Res 4k7	C7	Polyester 0.1µF
R5	Min Res 150k	D1,2	1N4001
R6	Min Res 1Ω	IC1	TDA2030
C1	PC Elect 1µF 100V	1	15W Amp PCB
C2	PC Elect 22µF 63V	1	15W Amp Bracket
C3	PC Elect 2.2µF 63V	6	Veropin 2141
C4	Polyester 0.22µF	3	Bolt 6BA ½in.
C5	Axial 2200µF 40V	3	Nut 6BA
		3	Wasner 6BA

15W Amp PCB

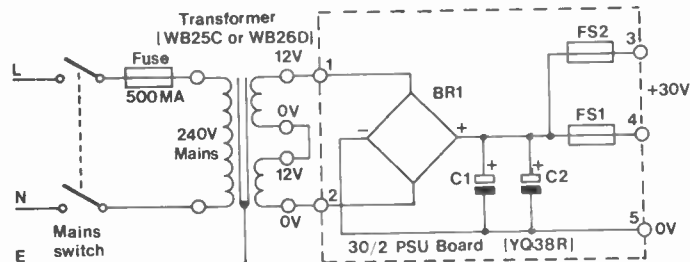
Order
YQ35Q (15W Amp PCB) **£1.75**

Bracket

A mounting bracket for the IC that permits easy fixing to a chassis or heatsink.

Order
YQ36P (15W Amp Bracket) **65p**

Recommended Power Supply



Parts List

C1,2	Axial 2200µF 40V
BR1	SO4
FS1,2	Fuse 20mm 1A (FS2 only required for stereo pair)
1	30/2 PSU PCB
4	Fuse Clips
5	Veropin 2141
1	Tr 12V 1A or Tr 12V 2A for stereo pair

Power Supply PCB

A PCB for the recommended power supply circuit.

Order
YQ38R (30/2 PSU PCB) **£1.95**

Kit

A complete kit of all the parts you need to build the amplifier as listed above.

Order
YQ43W (15W Amp Kit) **£5.75**

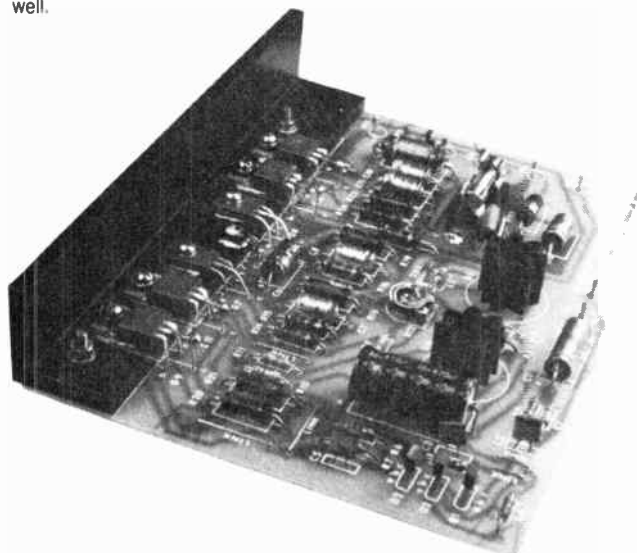
Module

The above kit is also available as a ready-made, fully tested and working module.

Order
YQ37S (15W Amp Module) **£6.95**

50W POWER AMPLIFIER

A superb quality 50W power amplifier. We threw away all our technical specification handbooks and designed an amp that just sounded musically perfect. When we'd finished we found that we'd got a pretty impressive technical spec. as well.



Specification

Power Output. (with power supply shown and extra heatsink):	
One channel driven at 1kHz	8Ω load 450mV in. 50W RMS 4Ω load 380mV in. 72W RMS
Two channels driven at 1kHz	8Ω load 450mV in. 36W RMS 4Ω load 380mV in. 49W RMS
Frequency response:	Flat from 20Hz to 28kHz
Full power bandwidth*:	3dB down at 95kHz (*Pulse tested at h.f.)
Noise:	< -100dB with power supply shown. < -110dB on stabilised power supply
Total harmonic distortion:	< 0.05% at 1kHz
Overall size:	6 x 4½ins. (153 x 115mm)
Unconditionally stable	
Damping factor:	80
Input impedance:	15kΩ
Slew rate:	14V/μs (at 10kHz)
Settling time with 1μF load in parallel with 8Ω:	5μs (simulated electrostatic speaker)

The amplifier is unconditionally stable into any load and is short circuit protected. The current limit circuitry is designed in such a way that it does not restrict the excellent transient performance. The unconventional class AB driver stage allows unmatched transistors to be used yet gives undetectable cross-over distortion.

Construction

The pcb is printed with component designations. Fit the pins and wire-links to the board, then fit the remaining components except C6 to Q12. Put the heatsinks on Q4,5. Bolt the main heatsink onto the top of the pcb and test fit Q6 to Q12. Cut suitable lengths of systoflex and insulate the leads of the transistors. Smear the mica washers with Thermpath, then bolt down the transistors. Form the leads of

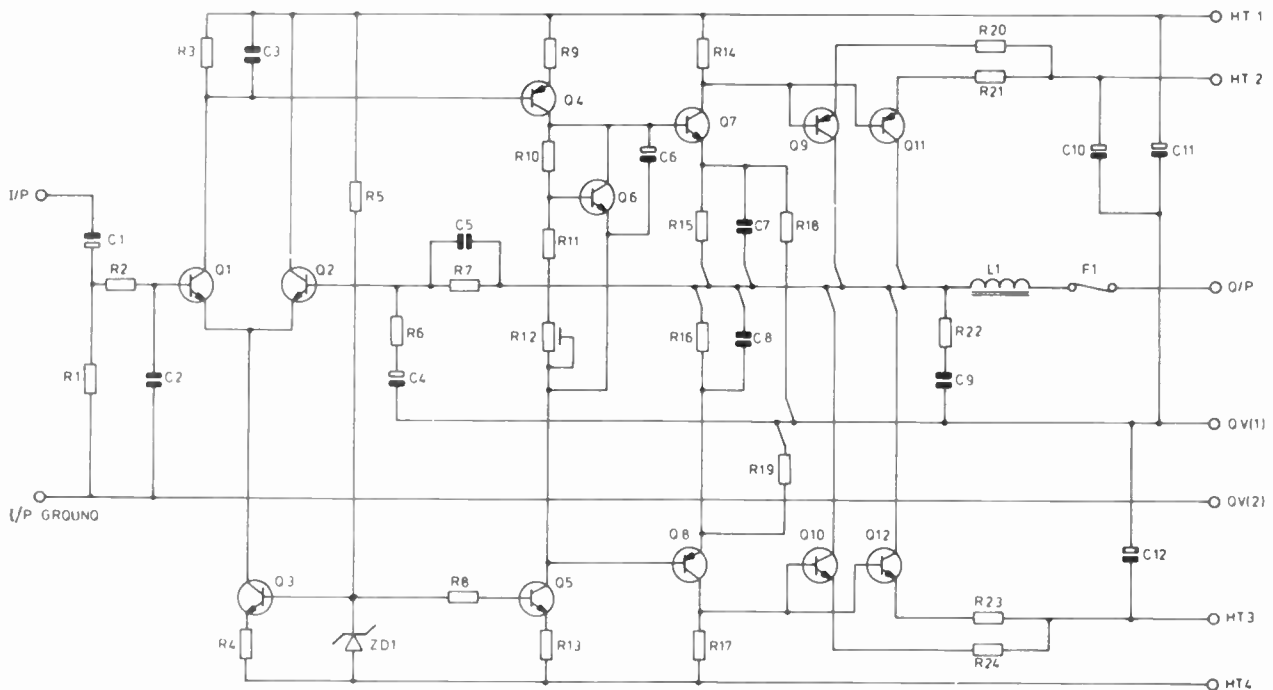
Q6 so that they hold the flat face of the transistor down touching the heatsink. Apply a blob of thermpath to the flat face of the transistor before fixing. If the additional heatsink 2E is used it may be fixed with 2 self tapper No.6 x ½in. Spread thermpath over the junction. Build the power supply and connect the power lines to the amp except for HT2. Connect a meter positive lead to HT1 and negative lead to HT2 (amp). Set the meter to 1A or 5A range (highest current on your meter). Turn R12 fully clockwise and then short circuit the input pin to the input ground pin.

Remove fuse from board then connect PSU to mains and switch on. The meter should give a small reading. If not (1A or higher), switch off immediately and recheck components, soldering etc. Turn meter scale down to 50 or 100mA range then turn R12 anticlockwise to give a reading of 20mA. If unable to adjust up to 20mA, R11 (4k7) will have to be reduced to 3k9 and R12 re-adjusted to give 20mA. Leave the meter connected and allow the amp to warm up for at least 30 minutes. Recheck and adjust current reading to 20mA if it has changed. Switch off.

Disconnect and link up HT2 to the PSU. Replace the fuse and connect a voltmeter between 0V (1) and O/P. Switch on and check that the meter reads between +0.2V and -0.2V. If this DC offset voltage does not fall between these outside limits, switch off and swap Q1 with Q3 or Q2 with Q3 and repeat the above test.

Disconnect the short circuit. Connect a loudspeaker between O/P and 0V (1). Apply a signal to the input and check that there is no audible distortion. The output sound should be clean and sharp with dramatic musical crescendos handled effortlessly. The amplifier may be used with the highest quality loudspeakers or audio monitors for superb natural sound reproduction.

When choosing a loudspeaker bear in mind that the amplifier is capable of producing transient peaks of power in excess of 100W anywhere in the audio frequency range from less than 20Hz to well over 20kHz. For normal domestic use it will be sufficient to bolt the 50W Hi-Fi Heatsink to the chassis in which the amp is built. For higher power use, fix a Heatsink 2E to the heatsink on the board.



Parts List For One Amp

(Double everything for stereo pair)

R1	Min Res 22k	C2	Ceramic 220pF
R2,4	Min Res 2k2	C3	Ceramic 220pF
R3	Min Res 4k7	C4	Axial 470μF 16V
R5	Min Res 18k	C5	Ceramic 100pF
R6	Min Res 220R	C6	Axial 1μF 63V
R7	Min Res 10k	C7,8	Polystyrene 1000pF
R8	Min Res 1k	C9	Polyester 0.1μF
R9	Min Res 470R	C10,11,12	Axial 2.2μF 63V
R10	Min Res 8k2	Q1,2,3	ZTX304
R11	Min Res 4k7	Q4	BC161
R12	Horiz S-Min Preset 2k2	Q5	BC141
R13	Min Res 820R	Q6	BC182L
R14,17	Min Res 100R	Q7	BD139
R15,16	Min Res 120R	Q8	BD140
R18,19	W/W Min 120R R20,21,	Q9,11	BD712
23,24	W/W Min 0.47R	Q10,12	BD711
R22	W W Min 10R	ZD1	BZX61C4V7
C1	Axial 10μF 63V	F1	Fuse 20mm 2A

L1 15 to 18 turns of 24swg enamelled copper wire wound on the body of a 1W Res 1k. Scrape off the enamel at each end of the coil and solder to the wires of the resistor.

The following parts are also required

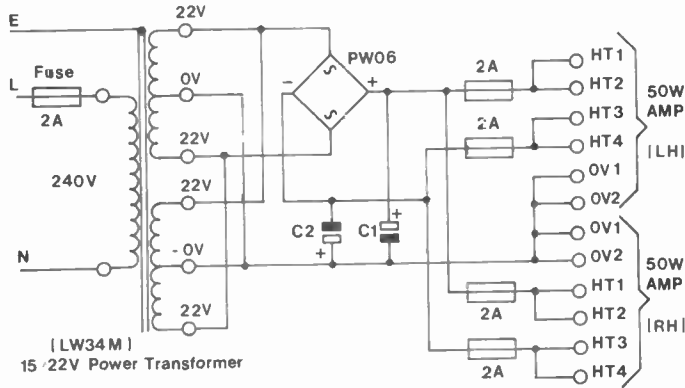
- 1 50W Hi-Fi PCB
- 1 50W Hi-Fi Heatsink (ready drilled)
- 2 Heatsink Clip-On
- 1 Chassis F/H 20mm
- 9 Pins 2141
- 2 Kit TO126
- 4 Kit (P) Plas
- 1m Systoflex 2mm
- 1 Small Thermpath
- 9 Bolt 6BA ½in (pack of 10 only)
- 9 Nut 6BA (pack of 10 only)
- 9 Shake 6BA (pack of 10 only)

Solder, strapping wire, Wire 10M for power supply connections, Min Screened for input, Zip wire for output to loudspeaker.

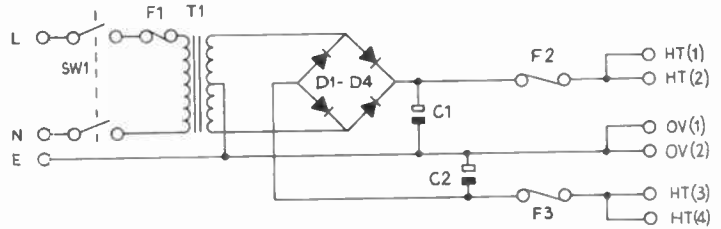
Power Supply Parts List

These are NOT included in the amplifier kit.

- C1,2 Can 4700µF 40V
- D1-4 1N5402 (4 off) (Mono)
- PW06 (1 off) (Stereo)
- T1 Tr 28V 1½A (Mono)
- 15/22V Power Tran (Stereo)
- F1 F Holder 20
- Fuse 20mm 1A



PSU for Stereo 50W Amp



PSU for Mono 50W Amp

- F2,3 Chassis F/H 20mm
- Fuse 20mm 2A (Mono) 4A (Stereo)
- SW1 DPST Switch e.g. Toggle Switch
- LP1 Pan Neon (connected across primary of T1)

Printed Circuit Board

Order

HQ68Y (50W Hi-Fi PCB) £3.95

Kit

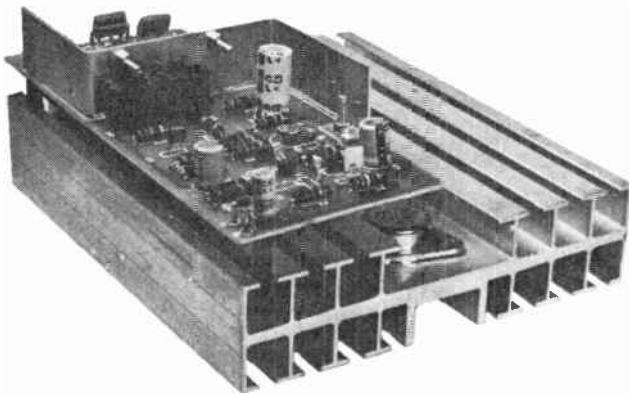
A complete kit of parts for this project offering a saving over buying all the parts separately. Kit does not include Zip Wire or Min Screened Cable.

Order

LW35Q (50W Amp Kit) £17.95

150W POWER AMPLIFIER

A very high quality power amp capable of delivering 225W continuous RMS sine wave into a 4Ω load when used with the power supply shown. With two amps running on the power supply shown the output is reduced to 160W per channel. (Into 8Ω the amp delivers 146W (one only) or 112W with a stereo pair). The transient peaks can easily exceed 300W so you should have a bank of speakers capable of handling at least 400W with one amp and 4Ω impedance, 300W each with two amps and 4Ω impedance, 300W with one amp and 8Ω impedance and 200W each with two amps and 8Ω impedance.

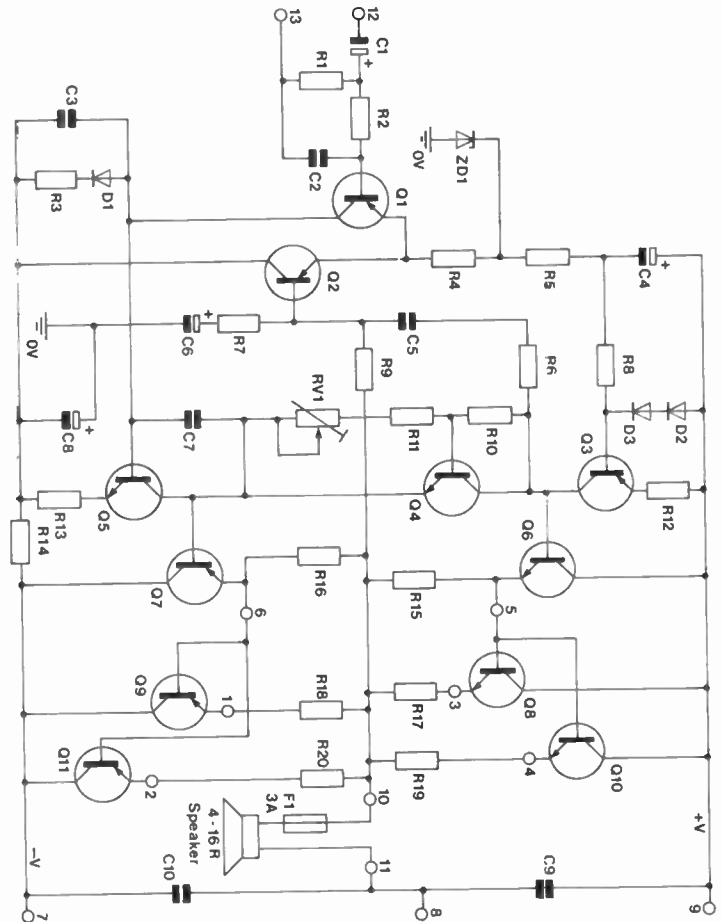


Specification

Output power with 4Ω load both channels simultaneously:	160W rms continuous sine wave per channel
Frequency response:	30Hz to 20kHz (-1dB) 15Hz to 37kHz (-3dB)
Total harmonic distortion at 160W:	<0.1% at 1kHz
Damping Factor:	80
Sensitivity for 160W into 4Ω:	1V rms

Construction

Fit the components to the pcb as shown. Note that the clip-on heatsinks are required for Q3, 4 and 5 and the Heatsink DR2 for Q6 and 7. Drilling instructions for the Heatsink 6W-1 are shown. Q6 to 11 must be mounted using mica washers and silicone grease e.g. thermpath. Ensure that all transistor mounting holes are deburred and rubbed down with a fine emery cloth as even the smallest metal filing may punch through the thin mica washer when the transistor is bolted down tightly, and this will damage several of the transistors. The pcb is fixed to the heatsink using three 19mm stand-offs. These slot neatly into the vanes of the heatsink. Connections to the collectors of Q8, 9, 10 and 11 are made by means of solder tags mounted under the nuts. Link the tags in pairs and take the two wires through the 8mm (5/16 in.) hole in the centre of the transistors. Keep the connections between the output transistors and the pcb as short as possible and use 32/02 wire. The output is protected against a short circuit by a 3A fuse fitted to the pcb.



Bolt down the power supply components — the bridge rectifier is best bolted to the side of the transformer chassis. Keep all the parts close together and keep all wires as short as possible. If you have two power amps, run separate wires from the power supply to each amp individually. The 0V return from the loudspeaker(s) should be brought to the 0V link on the capacitors C6 and C7 and not taken to the pcb. The 0V on the pcb(s) should be taken from this point also. Before connecting the plus and minus supplies to the amp switch on the power supply and measure the voltage between FS2, 3 and 0V. It should be between +5CV and +55V approx. And the voltage between FS4, 5 and 0V should be between -50V and -55V approx. (Measure on a DC voltage range.) If all is well switch off and connect the power supplies to the amp(s). Remove FS2 (FS3 for second amp) and connect a millimeter in its place. Turn VR1 to its centre position. Switch on and if the current exceeds 250mA switch off again immediately. Check for short circuits, but if none

can be found, the most likely cause is an earth loop. Before switching on again check that all the fuses are intact. Never switch on if any one or more of the fuses has blown. If all is well however, adjust VR1 until the current reads about 70mA. Allow the amp to warm up for about 15 minutes until the current stops increasing and then readjust for 75mA. Switch off, reconnect the fuse, switch the multimeter to a low DC volts range, switch on again and measure the voltage between the loudspeaker output and 0V. The voltage should not exceed plus or minus 0.2V. Use a heavy wire for connection to the loudspeakers bearing in mind that the transient peaks to the speakers can exceed 8 Amps. The pcb for this project is the 150W Amp Board (BB20W) see page 252.

Parts List for One Amplifier

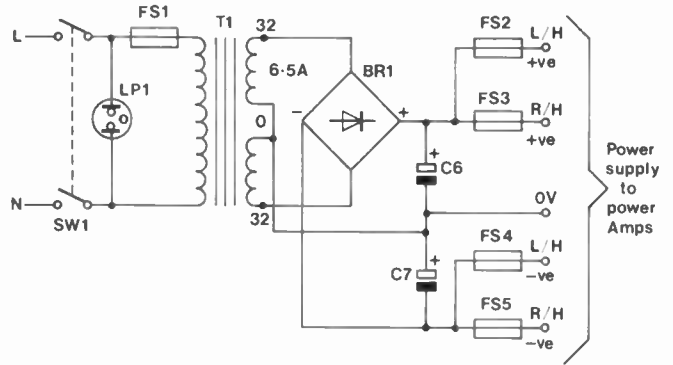
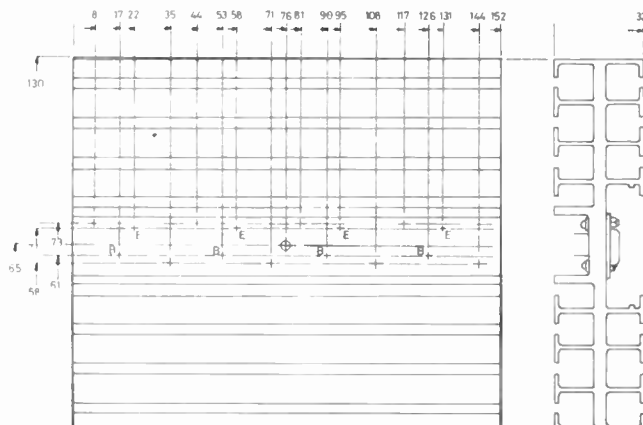
R1	Min Res 3k9	C8	PC Elect 47µF 63V
R2	Min Res 820Ω	C9,10	Polyester 0.1µF
R3	Min Res 220Ω	ZD1	BZX61C15V
R4	Min Res 2k2	D1,2,3	1N4002
R5	Min Res 1k	Q1,2,3	ZTX541 (or 542)
R6	Min Res 220Ω	Q4	2N1893
R7	Min Res 220Ω	Q5	BF337
R8	Min Res 1k	Q6	BD711
R9	Min Res 4k7	Q7	BD712
R10	Min Res 2k2	Q8	2N3055
R11	Min Res 1k	Q9	MJ2955
R12	Min Res 68Ω	Q10	2N3055
R13	Min Res 100Ω	Q11	MJ2955
R14	Min Res 33Ω	1	150W Amp Board
R15	Min Res 47Ω	13	Veropins 2141
R16	Min Res 47Ω	1	Chassis F/H 20mm
R17,18,		1	Fuse 20mm 3A
19,20	W W Min 0.27Ω	3	Stand-Off Long
RV1	Hor S-Min Preset 1k	2	Heatsink Clip-On
C1	PC Elect 4.7µF 63V	1	Heatsink 6W-1
C2	Ceramic 3900pF	12	Bolt 6BA x 1/2in
C3	Ceramic 1500pF	12	Nut 6BA
C4	PC Elect 220µF 16V	2	Mounting Kits 'P' Plas
C5	Ceramic 39pF	4	Mounting Kits TO3
C6	PC Elect 220µF 16V	4	Tag 6BA
C7	Ceramic 33pF	1	Heatsink DR2

Also required: Thermpath, Wire 32.02, Hook up wire etc.

Parts List for Power Supply

T1	Tr 32032 6½A
BR1	Bridge J02
C6,7	Can 10,000µF 63V
FS1-5	Fuse 20mm 3A (only 3 required for mono)
4	Chassis F H 20mm (only 2 required for mono)
1	Safuseholder 20mm
1	Square Neon
1	Rocker Sw DP
2	Clip Can 50
9	Bolt 2BA x 1in.
2	Bolt 4BA x 1/2in
9	Nut 2BA
1	Transformer Mounting Plate
2	Nut 4BA

Please note that the Heatsink 6W-1 is sufficient for amplifier powers up to 150W only when used vertically in free air. If the unit is to be used in a confined space or inside a cabinet, additional heatsinking or a fan is required.



150W Power Amp Kit

A kit of all the parts to build a mono amp, offering a saving over buying all the parts separately.

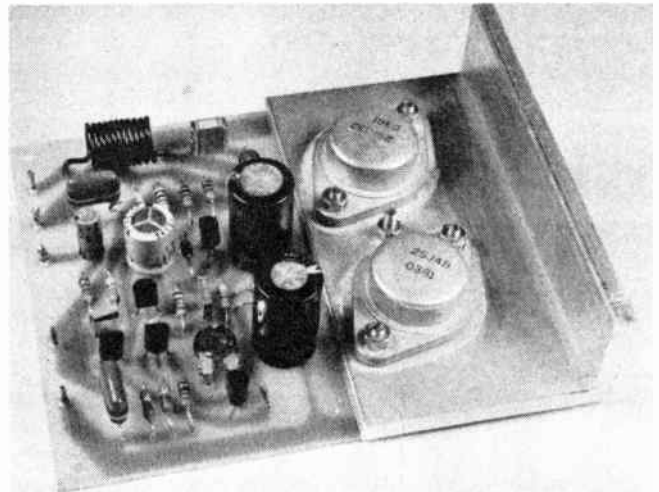
Order

LW32K (150W Power Amp Kit) £21.95

100W MOSFET AMPLIFIER

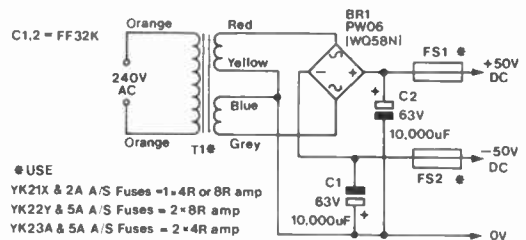


An incredible hi-fi amp that's virtually bomb-proof — like the best valve amps.



Specification

Power output:	>150W RMS into 4Ω >100W RMS into 8Ω
Sensitivity:	650mV RMS for rated output
Input impedance:	47k
Power supply:	44-0-44V DC 2A
Frequency response:	20Hz to 20kHz virtually flat 10Hz to 40kHz ±1dB
Total harmonic distortion:	20Hz to 20kHz ±0.005% 1kHz ±0.002%
Signal to noise ratio:	120dB



Circuit of suitable power supply. Parts must be ordered separately.

The following parts used in this project are not shown elsewhere in this catalogue.

Heatsink

A heatsink and mounting bracket for the amplifier.

Order

GA29G (MOSFET Amp Mtg Bkt) 95p

Printed Circuit Board

Order

GA28F (100W MOSFET Amp PCB) £1.95

Kit and Ready-Built Module

This project is available as a complete kit or as a ready-built module

Order

LW51F (MOSFET Amp Kit) £15.95
 YM27E (100W MOSFET Amp Assm) £18.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

COMBO-AMPLIFIER



An easy to build portable amplifier for all stage musicians requiring high power, reliability and versatility. A choice of equalisation methods is given on the two input channels, allowing a wide range of sounds in conjunction with the built in flanger. Sockets are provided for feeding a slave PA amplifier or tape recorder, and for using alternative speakers. The amplifier gives 75W into an 8 ohm speaker, or 120W into a 4 ohm speaker or combination of speakers. There are two inputs for guitars, keyboards or microphones. Channel 'A' has a five-step equaliser while Channel 'B' has bass and treble controls. The pre-amp features a low noise Bi-FET amplifying stage. The flanging effect can be switched in or out of circuit silently with the use of an external foot switch.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA41U (Combo Amp PCB) £6.95

Front Panel

A matt-black finish, punched and printed aluminium front panel for the Combo amplifier.

Order

XG03D (Combo Amp Frnt Panel) £3.95

Kit

A kit of all the parts required to build the Combo-Amp including the front panel, power amp kit, loudspeaker and footswitch, but not including the chassis or cabinet.

Order

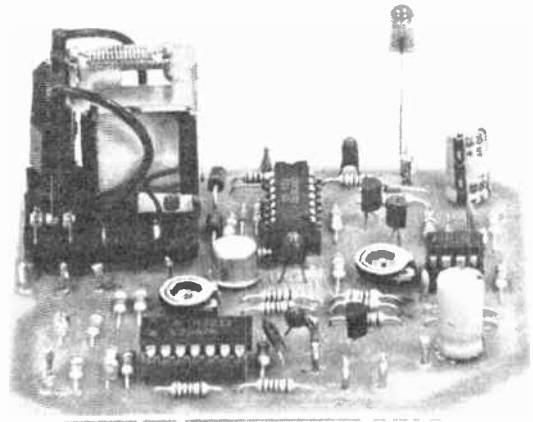
LW92A (Combo-Amp Kit) £119.95

Construction Details

Full construction details may be found in the Maplin Projects Book 1, which includes cutting details for a chassis and cabinet. See inside back cover of this catalogue.

BRIDGING MODULE MAKES 400W MOSFET AMP

- ★Increases output to 400W
- ★Anti-thump at switch-on
- ★Loudspeaker protection
- ★Accommodates wide range of input voltages



When used with two Maplin Mosfet Amps, this easy-to-add module will allow them to produce up to 400W RMS audio output!! By connecting the amplifiers to the input and to the speakers via this module many advantages are obtained in addition to the huge power gain. The module completely protects the loudspeakers and amplifiers through the on-board relay from short circuits, overloads, and high voltage offsets. In addition the module stops the audible thump at switch-on by connecting the speakers to the amps after a short delay. The massive power gain is achieved by making the input to one of the power amps out of phase with the input to the other amp and then bridging the speakers between the two amps. The very high output powers achieved will require speaker networks carefully chosen to ensure that the high currents can be handled. To achieve 400W a high power PSU will be needed i.e. 8 to 10 amps at 50-0-50V and it must be well regulated. The Mosfet Amps, however, thanks to the special characteristics of Mosfet transistors will give long and reliable service without strain even at this extremely high output.

The following parts used in this project are not shown elsewhere in this catalogue.

PCB, Kit and Ready-Built Module

This project is available as a complete kit or as a ready-made module.

Order

GA17T (MOS-Amp Bridge PCB) £2.75
 LK03D (MOSFET Bridging kit) £10.95
 YM28F (Bridging Amp Assmbl) £12.95

Construction Details

Full construction details may be found in the Maplin Projects Book 6. See inside back cover of this catalogue.

HI-FI SUB BASS WOOFER

This speaker may be added directly to the speaker outputs of your existing hi-fi system. The frequency response is 3dB down at 10Hz and the frequency is flat down to 27Hz. Upper frequency cut-off can be adjusted to between 50Hz and 100Hz to match the lower cut-off of your existing speakers. No stereo information is contained in signals under 100Hz so only one speaker is required. Please note that the cabinet shown in the photograph is not available, however cutting information is given in the construction details.



The following parts used in this project are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GA08J (Woofer PCB) £1.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1, see inside back cover for details.

150W STEREO DISCO

A superb fully stereophonic discothèque capable of delivering 150W rms continuous sine wave power per channel simultaneously into 4Ω loads. The unit features an automatic voice operated fader, extensive monitor facilities and the light modulator described below. The decks used in this project are the 12V Disco Deck (XG68Y) shown in the Record, Tape and Video Section. Being a low current electronic system, the motor switch relay board (BB26D) is no longer required.

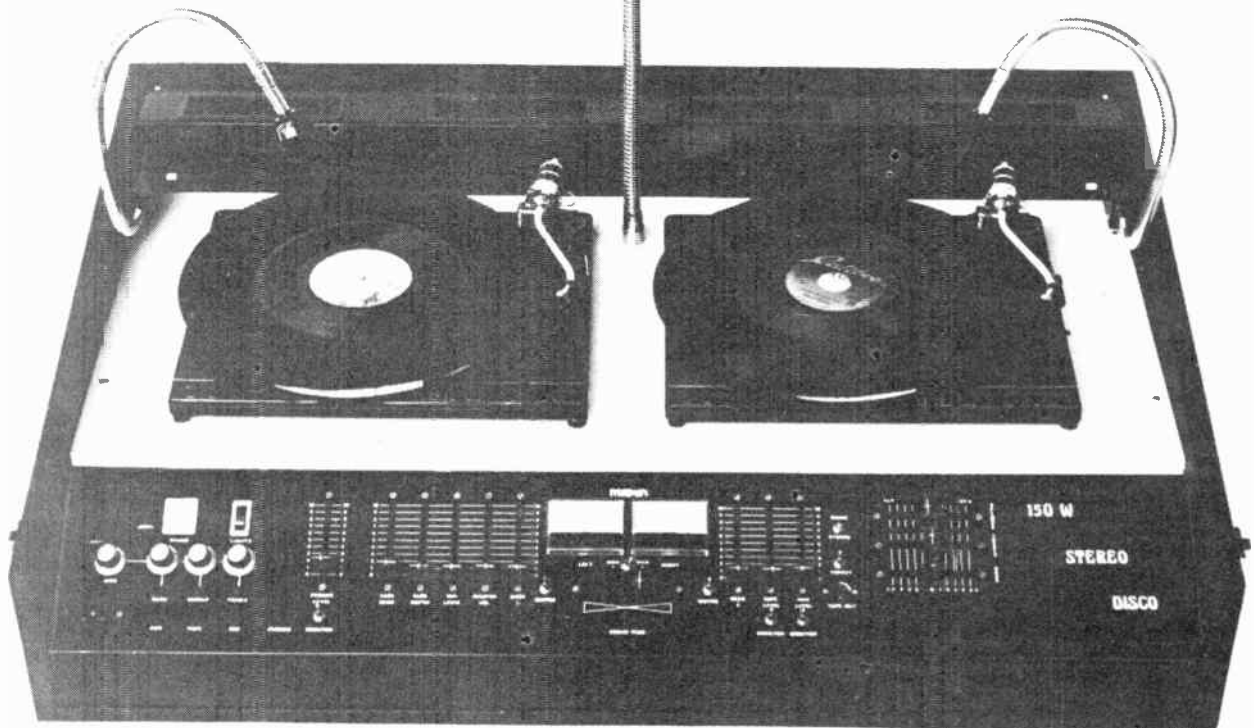
Woodwork

A sturdy wooden cabinet finished in hard wearing black plasticised cloth with a white laminated motor board. Supplied complete with lid and carrying handles.

Order

XB77J (Disco Cabinet) £59.95

Delivery by carrier. By mail-order please add carriage charge £5.50.



Specification

Output power continuous rms sine wave into

	4Ω	8Ω
One channel driven	225W	146W
Both channels driven (per channel)	160W	112W
Frequency response:	±1dB (30Hz to 20kHz)	
Total harmonic distortion at 150W:	<0.1% at 1kHz	

The following parts used in this project are not shown elsewhere in this catalogue.

Front Panel

A fully punched and formed front panel finished in semi-gloss black with lettering in white and hinged along its lower edge to facilitate construction.

Order

XB76H (Disco Front Panel) £11.95

Heatsinks

Order

XY26D (Heatsink Mtg Plate)	£3.95
XY27E (Heatsink Cover)	£6.95
BB18U (Heatsink DR2)	95p

Printed Circuit Boards

Order

BB81C (Disco Pre-Amp Tn PCB)	£4.95
BB19V (Disco PSU PCB)	£2.45
BB20W (150W Amp Board)	£2.95
BB26D (Motor Switch PCB)	£1.45
BB27E (Light Mod Bd)	£6.95
BB22Y (FET-Ceramic PU Bd)	£1.95
BB24B (Disco Fader Bd)	£2.95
BB25C (VUM & HP Amp Bd)	£3.95

Construction Details

Full specification and construction details are given in our leaflet MES 41. Please note that due to the introduction of the 12V Disco Deck, the following procedure should be implemented. At Terminal Block CB1, remove connections to relay pcb from terminals CB1e, CB1g and CB1j. Connect one red deck lead (+V) to CB1e, and the second to CB1j. Connect the blue deck leads (-V) from both decks to CB1g (0V). Switches 4 and 5 will operate as normal.

Order

XF04E (MES41) 40pNV

LIGHT MODULATOR

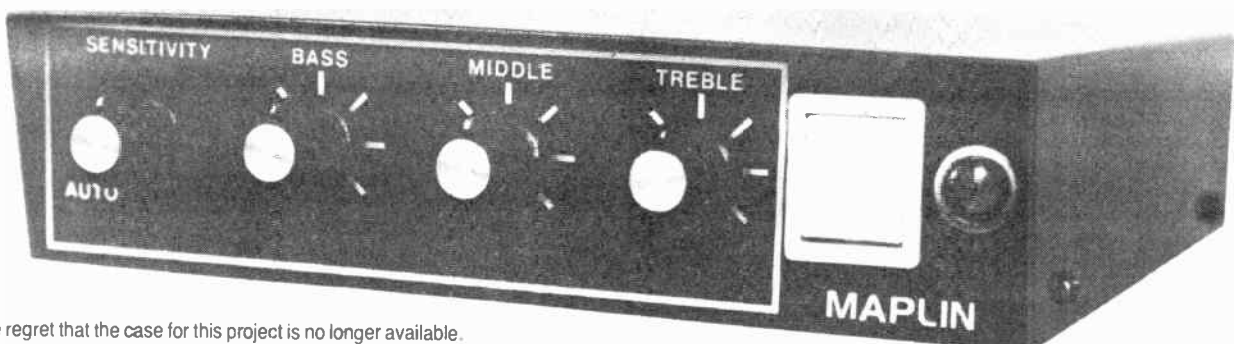
A high quality light modulator with 3 channels each capable of driving loads in excess of 1kW each. The unit has automatic gain control and very steep filters to ensure that signals proper to one channel do not operate the bulbs of another channel. This project is based on the Light Modulator PCB (BB27E) used in the 150W Stereo Disco project.

Construction Details

Full construction details are given in our leaflet MES 41.

Order

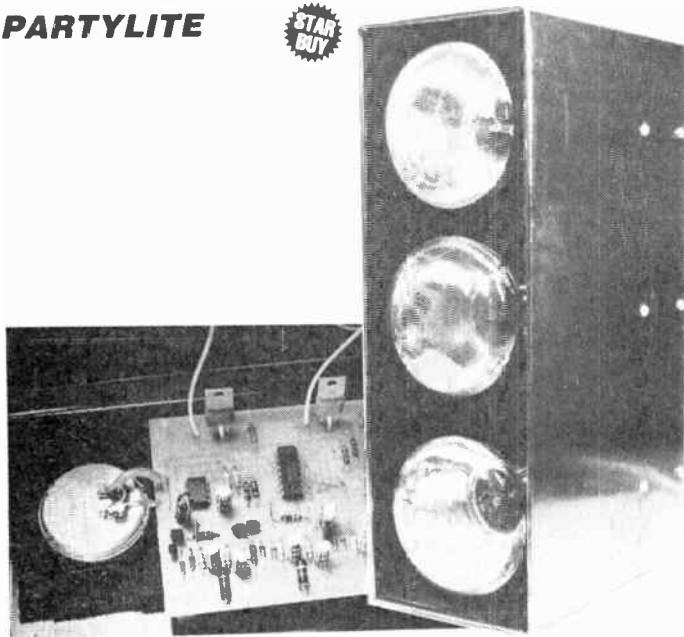
XH23A (MES 42) 25pNV



Note: We regret that the case for this project is no longer available.

PARTYLITE

STAR BUY



The idea of a three channel sound-to-light modulator is obviously not a new one, there being a multitude of units of this type already available, ranging from professional products to the types available at supermarkets for domestic use. Nevertheless, the Partylite is a worthy addition to the range because of its simplicity. It is fully automatic — no knobs to re-adjust every time the level or tonal content of your music alters. The Partylite also has its own built-in microphone eliminating the need for an audio connecting lead, making a completely free-standing unit and also avoiding the possibility of damage to your hi-fi or power amp. The Partylite employs zero voltage triggering of the thyristors. Consequently no interference is generated to produce those annoying clicks through the speakers, so common with cheaper sound-to-light units. It will work effectively on all three levels or in a disco environment. This is achieved by having independent automatic level control circuits for treble, middle and bass frequencies. Please note that a case, lamp fittings and lamps are not supplied. Also caution should be exercised as 240V Mains is present on the pcb.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA42V (Partylite PCB) £1.95

Kit

A kit is available containing all the parts you need to make the pcb. The kit does not include the case, lamp fittings or lamps.

Order

LW93B (Partylite Kit) £9.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1, described on page 271.

3800 AND 5600S SYNTHESISERS

Superb music synthesiser modules enabling very high quality synthesisers to be constructed. Modules available include a digital keyboard controller, voltage controlled oscillator, a sample and hold module, 5-channel mixer, voltage controlled amplifier, envelope controller, transient generators - one with re-trigger and one without, joystick controller, voltage controlled filter, reverb and phasing module, voltage controlled panning for stereo applications, and a very high quality power supply module capable of driving a large number of these modules and providing all necessary voltages. Full details about how to construct these modules and two typical applications are shown in our book XF11M. Although none of the metalwork or woodwork described in the book is now available ready-punched and printed, full details are given for making them yourself if required. All the printed circuit boards are still available. See top of next column.



Order

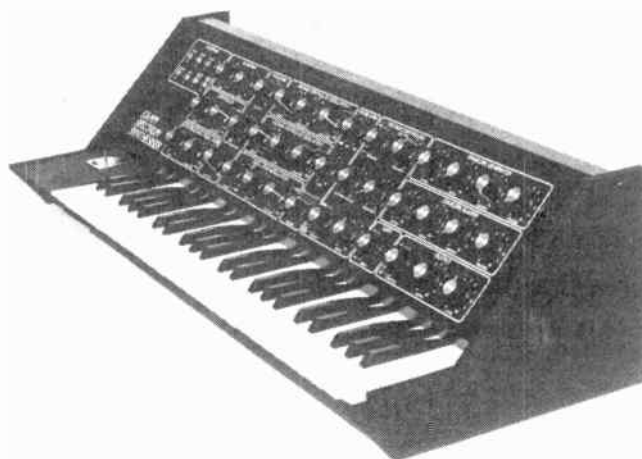
XF11M (Stereo Synth Book) £1.95NV

Synthesiser Printed Circuit Boards

Order

BB41U (Synth Mixer PCB)	£5.95
BB44X (Synth VCA PCB)	£2.45
BY87U (Synth Preset Mtg Bd)	95p
BY88V (Synth 1979 Kybd Cont)	£8.95
BY89W (Synth Binary Encoder)	£14.95
BB40T (Synth PSU Mk.II PCB)	£6.95
BY90X (Synth Smpl & Nse PCB)	£4.95
BB43W (Synth Trns Gen 1 PCB)	£4.45
BB45Y (Synth Trns Gen 2 PCB)	£4.45
BY81C (Synth Trns Rept PCB)	£1.95
BY82D (Synth Rvrb & Phs PCB)	£3.95
BY83E (Synth VC Pn & AncPCB)	£10.95
BB38R (Synth Oscillator PCB)	£6.95
BB48C (Synth Ext I/P's PCB)	£1.95
BB65V (3600 VCF PCB)	£2.95
BF95D (Joylever PCB)	£1.20
BY86T (3800 Interface PCB)	£3.95
BB47B (Synth Optp Stge PCB)	£7.95

THE SPECTRUM SYNTHESISER



The Spectrum is a monophonic two-oscillator switch-linked synthesiser featuring advanced specification, constructional simplicity and low cost. Modulation, timbre control, and interface facilities not found on any comparable synthesiser make it extremely powerful and versatile for keyboard playing, sound effects and many other home, stage or studio applications. Construction is simplified by the use of integrated circuits that each perform major synthesiser functions with few external components. No glueing of contact blocks or bending of gold wires is needed to assemble the keyboard contacts; a new contact system only requires soldering of the contacts and drilling of the chassis to mount the contact PCB. Modulation routing is accomplished by source and function switches and depth controls, rather than the usual method of providing each source with its own depth for each controlled function found on some small synthesisers. Switching is most suitable for a large number of sources as here, and allows fast selection of source and modulation effects with preset depths, in favour of simultaneous modulation of one parameter by more than two signals. Six modulation signals are available: keyboard controller, low frequency oscillator (LFO), envelope generator, noise generator and external. The joystick controller routes a voltage dependent on the side-to-side position of the stick to various voltage controlled circuits, allowing it to be used to control the pitch (pitch bend) or timbre. The external voltage fed into the controller jack can override or add to the joystick voltage for control by additional synthesiser equipment, or a pedal can be plugged in and used for control by attenuating a fixed joystick voltage. The low frequency oscillator generates random and regular sample and hold effects in addition to the four common waveforms. The regular SH option allows rising and falling scales, rising and falling repeating groups of two, three or more notes, and other sequencer-like effects, with the pattern controlled by the LFO rate. A LED displays the LFO cycle and the joystick's vertical position determines the amplitude at the LFO manual output. The envelope generator is one of the exponential ADSR type and, like the LFO has + and - outputs that can be separately selected for each controlled parameter. The envelope generator shares its gate signal with the envelope shaper, which determines the loudness contour of each note. 'Single' on the gate selector switch causes gating each time a first key is depressed. 'Multiple' re-triggers when any new note is played, allowing fast runs without 'missed' notes. 'Hold' keeps the gate high for continuous effects, and 'LFO' causes gating on each LFO cycle. In the 'Repeat' position the envelope generator re-triggers at the end of the decay period, acting as an additional LFO with variable symmetry. This allows complex rhythmic effects when used with the LFO, and gives great scope for 'backdrop' sounds based around complex SH patterns with periodic timbre sweeping effects derived from the EG. 'Key Repeat' brings in the repeat only when a key is held, allowing

key-synchronised repeating notes and delayed modulation (the delay determined by the attack time). An LED indicates the EG's attack segment. The voltage controlled oscillators (VCO's) each have six switched octave ranges and five waveforms. The sub-octave output is a pulse wave with a square wave added an octave below, making the sound fuller and richer. The tuning LED detects the beats between the oscillators, and indicates when the pitches are in simple musical intervals, useful for tuning without sounding a note (e.g. on stage). The pulse width of VCO 1 is variable, and VCO 2 has a tune control with a $\pm 1/5$ th range. The VCO's can be used together to provide a vast range of sounds not possible with basic synthesisers having only waveform, shape, VCF cut-off and VCF resonance as the controls affecting basic timbre. This is done by frequency modulation and synchronisation — special features of this design. FM uses the triangle output of VCO 1 to modulate the frequency of VCO 2 up to $\pm 100\%$ giving a whole range of non-harmonic tones for bell, gong and chime sounds etc. Synchronisation gives various waveforms from VCO 2 which have particular bands of harmonics emphasised for strong, voice-box-like sounds. This is achieved by resetting the output of VCO 2 upon each cycle of VCO 1, so the tones generated are always harmonic. Two modes of sync. are provided: Sync I is that normally found on rampwave oscillators, the VCO 2 waveform beginning in the same way after each reset; Sync II is something totally new — the triangle output is set to midway each time, but then carries on in the same direction as the new cycle. VCO 2 locks onto VCO 1 harmonics with the change from one harmonic to the next emphasised by a sharp change in tone. This enables automatic arpeggiation and incredible tone sweeps to be obtained since VCO 2 now is effectively a voltage controlled waveform generator/frequency multiplier. The sync. control attenuates the pulses fed to VCO 2 so that it only resets if the waveform is above a certain threshold, resulting in the oscillators being locked together in musical intervals (3rds, 5ths etc). Simultaneous Sync. I and FM produces harmonic tones with the shape of FM-ed waveforms within each cycle. The ring modulator uses triangle and square VCO waveforms to provide further complex tones. Its output is mixed with the noise signal and fed into a special voltage controlled amplifier (VCA). This can be controlled by the LFO or EG and gives the signals their own loudness contours. Hence noise 'chiffs' can be added to notes, or ring modulation set to swell in as a note decays. The VCA output is fed to the voltage controlled filter (VCF) mixed with the VCO outputs. The VCF offers the two most useful responses, low pass and band pass, plus an intermediate response for bright sounds that remain strong in lower harmonics. Cutoff frequency and resonance controls perform their normal functions and a keyboard follow control determines how the cutoff frequency varies over the keyboard range. After envelope shaping, the signal is fed to the voltage controlled pan circuit which can modulate the location of the sound in the stereo field by the LFO or EG signals. The stereo outputs can also be used for voltage control of the depth of external effects such as reverb, phase, and echo, by routing one signal via the effects unit and one direct to the amplifier. A mono output is also provided, and the VCA can also be used for additional amplitude modulation with the LFO as source (for tremolo and other effects). The interface jacks allow connection to external devices such as sequencers, additional VCO banks, waveform processors etc. The Spectrum Synthesiser uses the 1V/octave CV standard, and can be interfaced to any other exponential CV synthesiser.

The following is a list of parts used in this project, the details of which are not shown elsewhere in this catalogue.

Hardware

Order		
XG08J	(Spectrum Front Panel)	£14.95
XX46A	(Spectrum Joystk Panel)	£2.25
XY90X	(Spectrum Bus Bar Set)	£2.25

Printed Circuit Boards

Order		
GA03D	(Spectrum PSU PCB)	£2.45
GA09K	(24-Way Contact PCB)	£3.95
GA10L	(25-Way Contact PCB)	£3.95
GA36P	(Spectrum VCO PCB)	£7.95
GA53H	(Spectrum LFO PCB)	£2.95
GA55K	(Spectrum Cntrlr PCB)	£2.95
GA57M	(Spectrum VCF PCB)	£4.95
GA59P	(Spectrum Shaper PCB)	£6.95

Kit

A kit which does not include a cabinet (a cabinet is not available for this project) is available. The kit includes everything you need apart from the CEM integrated circuits. These are available from Digisound Ltd, 14-16 Queen Street, Blackpool, Lancs. FY1 1PQ. All the other parts including the front panel are in our kit.

Order		
LW60Q	(Spectrum Synth Kit)	£179.95

Construction Details

A 32-page book describing how to build the Spectrum Synthesiser.



Order

XH56L	(Spectrum Synth Book)	£1.20NV
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HEXADRUM



Hexadrum is a touch-sensitive electronic drum set that you play with your fingertips. Six sensors are arranged to be beneath the fingertips of a comfortably placed hand and are played by simply tapping with the fingertips. A harder tap produces a louder sound; a tap with an object harder than a fingertip produces a sharper sound. Any number of sensors may be struck at any time to produce a composite sound. The only electronic control is to set the overall signal level output, in other words, a volume control.

When played through an amplifier and speaker system designed to give faithful reproduction of audio, the sounds of Hexadrum are best described similar to bongoes, though the lower range drums are of a lower range than normally encountered in bongoes and more like a bass drum. Like all other electronic instruments, Hexadrum may be played through any special effects unit such as reverberation, echo, phaser, flanger or synthesiser external output, to obtain a different sound.

Its use is not restricted to trained percussionists, for the 'hand' layout virtually gives all 'finger-tappers' opportunity to experiment with rhythms. The potential of this low cost instrument makes it ideal for the music room — be it in school, home or studio. The touch sensitive pads give the Hexadrum some of that creative dynamic feel of the skin drum.

Being battery powered, the unit can be connected via guitar coiled cable to group amplifier for on-stage performance. In the home or classroom, the output plugs directly into tape, mic or line inputs of your stereo (or mono) amplifier unit.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order		
GA32K	(Hexadrum PCB)	£2.95

Kit

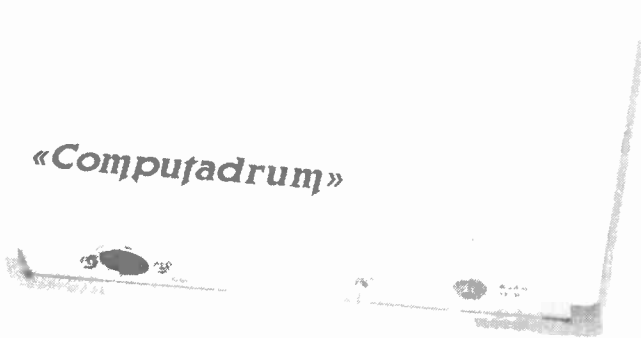
A complete kit for this project (excluding the battery) is available.

Order		
LW85G	(Hexadrum Kit)	£21.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

COMPUTADRUM



A six channel drum synthesizer enabling a home computer to generate drum sounds whilst functioning as a programmable sequencer. The six various sounds are adjustable for pitch and resonance. Output is to an external amplifier. The Computadrum can be used directly with the BBC model B, the VIC-20, Commodore 64, Atari 400/600XL, 800/800XL, 130XE and the Memotech MTX500/512 home computers. It can also be used with the ZX81 and ZX Spectrum provided these are fitted with an external input/output port providing at least six digital outputs. The Maplin ZX81 I/O Port would be ideal for the ZX81, for example. Since the Computadrum only requires brief trigger pulses to initiate operation, it may be possible to devise a form of digital controller instead of a computer.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB72P (Computadrum PCB) £2.95

Kit

A complete kit of parts excluding case and nuts and bolts.

Order

LK52G (Computadrum Kit) £9.95

Construction Details

Full construction details may be found in the Maplin Projects Book 12. See inside back cover of this catalogue.

THE SYNTOM DRUM SYNTHESISER



The Syntom is a very effective drum synthesiser that can produce a variety of fixed and falling pitch effects, triggered either by tapping the unit itself, or by striking an existing drum to which the device is attached. Four potentiometers give control over different characteristics of the sound, the Volume control being used to switch off the internal battery as well as determining the level of the signal sent to the external amplifier. The Decay pot. governs the time taken for the sound to die away after each strike, from less than 1/10 sec. to several seconds, giving a wide range of envelopes. The frequency of the note is variable over the entire audio range by means of the Pitch Control, and the Sweep Control introduces a voltage causing the pitch to fall as the amplitude decreases. These controls, when used in combination with each other enable the most popular drum synthesiser effects heard on commercial recordings to be obtained.

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA05F (Syntom PCB) 98p

Front Panel

A printed and punched self-adhesive Syntom front panel.

Order

BH60Q (Syntom Front Panel) £1.50

Kit

A complete kit for this project (excluding the battery) is available.

Order

LW86T (Syntom Kit) £12.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

THE SYNWAVE SOUND GENERATOR



The Synwave produces

sounds for use in electro-music by percussive control. The

minimum number of controls have been

selected to give a wide range of 'sea-wave'

sounds. In addition different settings of the

controls will produce wind, cymbal and

woodwind sounds. Like the Syntom project

the unit can be triggered by tapping the case

or by striking a drum (on which the Synwave is mounted). These projects are also

ideal for triggering from an external source (e.g. a sequencer, synthesiser or micro)

and thus a second mode of operation can be from an electronic trigger using a

positive-going edge of about 7 to 15 volts in amplitude. Interaction of the two

modes of use is possible so that complex rhythms can be made from a steady

'external triggered' beat mixed with hand or drum taps providing syncopation. The

four controls are Volume (with on/off switch), for setting output level; Decay —

adjusts the time it takes for the sound to die away; Pitch — sets the frequency

range of noise from low to high; 'Q' — a resonance control that narrows and

highlights the pitch range selected

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA35Q (Synwave PCB) £1.20

Front Panel

A printed and punched self-adhesive front panel for the Synwave.

Order

BX99H (Synwave Front Panel) £1.50

Kit

A complete kit for this project (excluding the battery) is available.

Order

LW87U (Synwave Kit) £12.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

SYNCHIME



Designed to complement Maplin's popular Syntom and Synwave projects the Synchime effects unit creates a further range of specialised sounds. It is small and light enough to attach to a drum and will produce a chiming metallic sound when the drum is struck, or the case tapped. Alternatively a simple 5V trigger signal will operate the effect. The straightforward controls provide easy adjustment for volume, decay time, and frequency settings for the Synchimes' two oscillators. With output frequency variable from 100Hz to 7kHz a wide range of sounds is readily obtainable and an output signal level of up to 5V peak to peak ensures that any normal power amplifier can be adequately driven. The easy to construct pcb allows even the novice to feel confident in attempting this project, and by using the printed front panel, a very smart unit can be realised.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB38R (Synchime PCB) £1.20

Front Panel

Order

BK77J (Synchime Front Panel) £1.50

Kit

A complete kit for this project is available.

Order

LK15R (Synchime Kit) £12.95

Construction Details

Full construction details may be found in the Maplin Projects Book 8. See inside back cover of this catalogue.

THE SYNCLOCK TRIGGER SEQUENCER



The Synclock is a compact and easily expandable control sequencer which can be used to trigger the Syntom, Synwave and Synchime as well as most synthesisers and other sound generators, to give new and exciting rhythms and sounds.

When used with the Syntom, Synwave or Synchime the internal triggers of these devices still operate allowing an even larger scope for filling in further rhythms by hitting the box. The Synclock has a sequence length variable between 1 and 10 beats and this is of course expandable with further Synclocks. This system allows any number of beats in any time signature to be programmed. There are only a minimum number of controls for ease of use and setting up. The three controls on the top of the unit are: Stop/Start, Sequence Length, and On-Off/Tempo with the programming switches and indicators on the front panel. The sockets for interfacing and control are mounted on the side of the box and finally the clamp is mounted on the bottom if required. All the components except the LED's and controls are mounted on a PCB and everything fits into the same size box as the Syntom, Synwave and Synchime.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA54J (Synclock PCB) £1.75

Front Panel

A printed and punched self-adhesive front panel for the Synclock.

Order

XX44X (Synclock Front Panel) £2.25

Kit

A complete kit for this project (excluding the battery) is available.

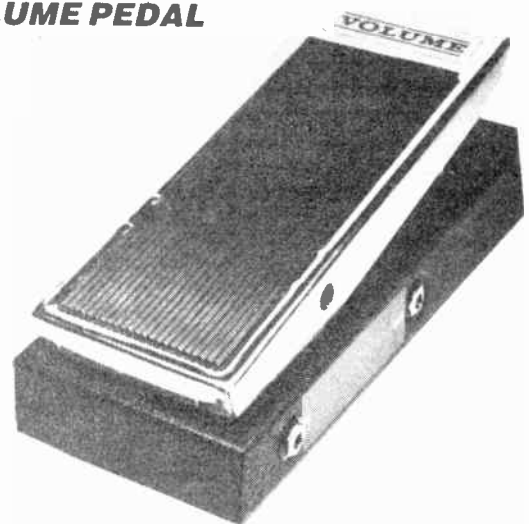
Order

LW55K (Synclock Kit) £21.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

HALL-EFFECT VOLUME PEDAL



A conventional volume pedal consists of an ordinary potentiometer connected in the usual volume control fashion, and operated from the foot pedal via a rack and pinion mechanism. This system works very well, but with a lot of use the potentiometer's track can become worn with consequent noise being generated as the pedal is operated. The problem is overcome in this pedal, which uses a magnet and a Hall effect device instead of a potentiometer. As the pedal is depressed the magnet is brought closer to the Hall effect device, and the increased magnetic field is converted into an increase in voltage.

The input signal is passed to the output by way of a voltage controlled attenuator (VCA) and, like a volume control, this can provide a level of attenuation of anything from zero to around 80dB. However, it is of course controlled by means of a voltage applied to its control terminal. The output voltage of the Hall effect device is slightly too high in terms of its quiescent level, and too low in terms of voltage change produced by the varying magnetic field, and so the device cannot directly control the VCA. A level shifter and low gain DC amplifier are therefore used to process the output of the Hall effect sensor and give a suitable control voltage for the VCA.

Pre-emphasis (treble boost) at the input of the VCA and de-emphasis (treble cut) at the output are used to give a slight improvement in the signal to noise ratio of the unit. The ratio is actually about 80dB and the background noise should be completely insignificant provided the unit is not used with a very low level signal. The circuit can take a maximum input level of about 2 volts RMS at most frequencies without serious distortion being produced. The circuit has an input impedance of about 50k and an output impedance of approximately 350 ohms.

Kit

A kit of parts for this project (excluding the battery) is available.

Order

LW88V (Volume Pedal Kit) £27.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

AUTO SWELL PEDAL FX2



A foot-operated volume control, or swell pedal, is one of the simplest effects pedals there is — it is also one of the most useful. The most common application is for reducing an instrument's volume during accompaniment playing, allowing it to be increased for a solo. Whilst it is easy to set a pedal at either end i.e. minimum or maximum, a half-way setting can be difficult to duplicate accurately. The auto swell enables the player to set a constant accompaniment level, and increase the volume (at a preset rate) by pressing a pedal. When the pedal is released the volume reverts immediately to the lower level. Noise and wear problems associated with the pedal-operated pot type of mechanism are also eliminated. The unit can be put to a variety of uses and some of these will be suggested in the section on applications in the article. The circuit is essentially a voltage controlled amplifier, the gain of which is controlled by a variable rate amp which is initiated by a foot switch. The advantages of this method over such devices as a conventional swell pedal or compressor unit will only really become apparent when you start to experiment with the possible uses it can be put to on guitar or keyboards.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order
GA52G (Auto Swell PCB) £1.50

Kit
 A complete kit for this project (excluding the battery) is available. Please note that the front panel shown in the picture is not available.

Order
LW89W (Auto Swell Kit) £11.95

Construction Details
 Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

AUTO-WAA EFFECTS UNIT



A Waa-Waa Unit for guitars where the filter frequency is automatically controlled by the input signal amplitude, as opposed to a foot operated pedal, for example. Very easy to use whilst giving a good range of various effects. The filter frequency is adjustable, and a sweep depth control is also included. Positive feedback is used to give a peak in the response just above the cut-off frequency to obtain the best 'waa' effect, or alternatively operate as a 12dB/octave lowpass filter for more subtle effects.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order
GB54J (Auto-Waa PCB) £2.25

Kit
 A complete kit of all parts excluding case and hardware, optional IC sockets and battery.

Order
LK36P (Auto-Waa Kit) £11.95

Construction Details
 Full construction details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

GUITAR EQUALISER



A 6-channel Graphic Equaliser for use with electric guitars tuned to the standard E, A, D, G, B, E frequency range of 82.4 to 329.6Hz. Every channel provides up to 10dB of signal boost or cut associated with each string, and up to 6dB gain increase on upper harmonics, extending to 25kHz.

The module uses micro-power IC stages to keep current consumption extremely low, allowing long life from PP3 type batteries, or power can be supplied externally via an integral 3.5mm socket. Each of the six channels has a band pass characteristic chosen to closely approximate each guitar string frequency. Varying the slider control determines the gyrator resonance which increases or decreases the feedback path. Therefore, each filter frequency band can be independently amplified and attenuated by up to 10dB, or kept at unity gain by positioning the slider to its mid-point.

The Equaliser uses one PP3 size battery.

The following are not shown anywhere else in this catalogue.

Printed Circuit Board

Order
GB92A (Guitar Equaliser PCB) £5.45

Front Panel
 A printed stick-on front panel for the guitar equaliser.

Order
FT69A (Guitar Equisr Fr Pan) £1.75

Kit
 A complete kit of all parts required to build this project (excluding battery) is available.

Order
LK74R (Guitar Equaliser Kit) £27.95

Construction Details
 Full construction details may be found in the Maplin Magazine Issue 15. See inside back cover of this catalogue.

HARMONY GENERATOR



Harmonisers are beginning to attract much attention from musicians for use in live performances where they can 'thicken up' the sound tremendously. Most musicians, however, cannot savour the delights of the harmoniser due to its very high cost. The only pitch change device within the price range of the average musician is the octave divider type of accessory used by guitarists. Between these two devices there appears to be a void.

The Harmony Generator is intended to fill this void, being a compromise between the simplicity of the octave divider and the versatility of the harmoniser. The Harmony Generator can give up to three octaves of pitch shift, up or down, including individually selectable intervals of '3rd' and '5th' harmonics. The pitch shifts are digitally derived and thus very stable, obviating the need for precise setting-up and pitch shift adjustments during a performance. The Harmony Generator can, however, only accept monophonic signals from a source such as mono synthesiser. Indeed this is an ideal device for use with a single VCO synthesiser, greatly extending its versatility.

The Harmony Generator will not only follow the pitch of the instrument, but also the amplitude, applying the same amplitude envelope to the harmony signal as that of the instrument. A mixer is provided so that the contrast between the instrument and harmony signals can be optimised.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA48C (Harmony Gen PCB) £1.95

Kit

A complete kit for this project (excluding the battery) is available.

Order

LW91Y (Harmony Gen Kit) £17.95

Construction Details

Full construction details may be found in our book E&MM Projects Volume 1 described at the end of this section.

VERY LOW DISTORTION AUDIO OSCILLATOR



An audio oscillator is an essential piece of test equipment for anyone building audio equipment, hi-fi gear etc. Because of its very low distortion sine wave output this oscillator is suitable for use with even the most sophisticated hi-fi equipment.

258

Range: 20Hz to 26kHz in three ranges
Distortion: Better than 0.01% (sine wave 1kHz)
Outputs: Sine or square wave variable voltage up to 1V

Printed Circuit Board

Order

BB72P (Sine/Square Gen PCB) £4.45

Front Panel

A fully punched and printed front panel finished in semi-gloss black with white lettering. Panel is a direct replacement for the panel supplied with the Verobox 213.

Order

BB73Q (Audio Osc Frt Panel) £1.95

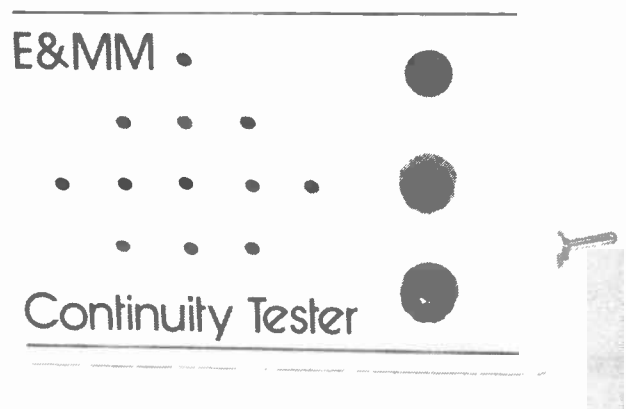
Construction Details

Full construction details are given in our leaflet MES 15.

Order

XH24B (MES15) 15pNV

CONTINUITY TESTER



A continuity tester is a very useful gadget around the home, workshop, and on stage it is invaluable for testing fuses, jack leads, speakers, semiconductor junctions, printed circuit boards, power transistor/ heatsink insulation and a multitude of other potential sites of trouble. Like most testers, this design gives an audio indication of continuity, and has the advantage of two modes of operation, giving increased versatility particularly for printed circuit board checking. A problem that is often encountered when testing for short circuits on component boards is that a semiconductor junction (which can be a diode or part of a transistor or integrated circuit) connected across tracks to be tested, could give a false alarm. When forward biased there is a voltage drop of about 0.6 volts across the junction, but this drop is normally sufficient to prevent the tester from operating and indicating continuity. Though false alarms of this type can often be checked by reversing the test probes (ineffective in circuits where there are two junctions connected 'back to back') this tester can operate such that continuity will only be indicated if the voltage drop across the test probes is less than about 0.5 volts, avoiding misleading results due to forward biased semiconductor junctions.

Printed Circuit Board

Order

GA11M (Continuity Testr PCB) 98p

Construction Details

Full construction details may be found in the book E&MM Projects Volume 1 described at the end of this section.

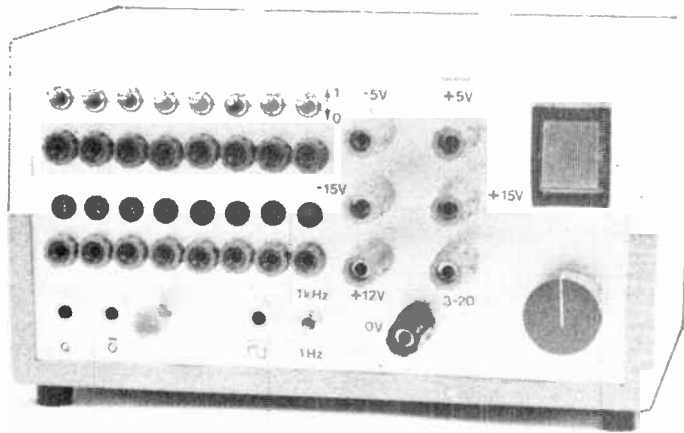
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★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

MAPLIN MINI LAB POWER SUPPLY



- ★Up To 2A Output
- ★Fixed & Variable Supplies

The Maplin Mini Lab is a 'must' for the constructor or experimenter. Its fixed $\pm 5V$, $\pm 15V$, $+12V$, and variable $+3$ to $+20V$ outputs cater for virtually all TTL, microprocessor, op-amp discrete component needs. High current capabilities (e.g. $+15V$ 1A to 24V 2A) add to the flexibility of this unit. Switches on the front allow for various input states for testing logic circuits, or even as an 8-bit input to a microcomputer's input/output port. Similarly associated sockets and LED's display logic "high/low" states from circuits under test. A further switched facility allows a 1Hz/1KHz clock to become available to study shift register operation. A special electronically "de-bounced" switch allows "pulse at a time" study of such circuits. Easy Veroboard construction and IC regulators enhance the accuracy and simple construction of this invaluable power supply. As this kit does not have a pcb, it is not covered by our 'Get-You-Working-Service'.

Kit

A complete kit of all parts (excluding the case) is available for this project.

Order

LK09K (Minilab Kit) £39.95

Construction Details

Full construction details may be found in the Maplin Projects Book 8. See inside back cover of this catalogue.

LIVE WIRE DETECTOR



- ★Gives visual and audible warning of the presence of 240V AC mains live
- ★Does not require wires under test to be connected to a load
- ★Adjustable for sensitivity

The Maplin Live-Wire Detector will detect the presence of mains electricity whether there's a current flowing or not. It's better than neon screwdrivers or multimeters because you do not have to make contact with the wire - it signals the presence of mains better than metal detectors, because it only indicates if the wire is live; also, it's considerably cheaper.

It's the sort of device every household should own and anyone can use it because you don't have to actually touch dangerous points with any part of the Live Wire Detector. Even if the wires are not connected to anything at one end, Live Wire will tell you if they're live. You could use it to find buried wires in dry plaster or plastic conduit or under floor or ceiling boards up to a distance of 2 inches (50mm).

★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

Other uses of Live Wire include detecting breaks in cables or appliance leads. If a fuse blows, Live Wire will indicate mains present up to all the fuses, and mains presence on the wires leaving the fuses except the dead one. Before doing any work on your house wiring use Live Wire to make sure the circuit really is safe after pulling out what you think are the relevant fuses. Uses one PP3 battery.

The following parts are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB85G (Live Wire Detect PCB) 50p

Case

Order

FT39N (Live Wire Det Case) £1.10

Kit

A complete kit of all parts is available excluding PP3 battery and PCB.

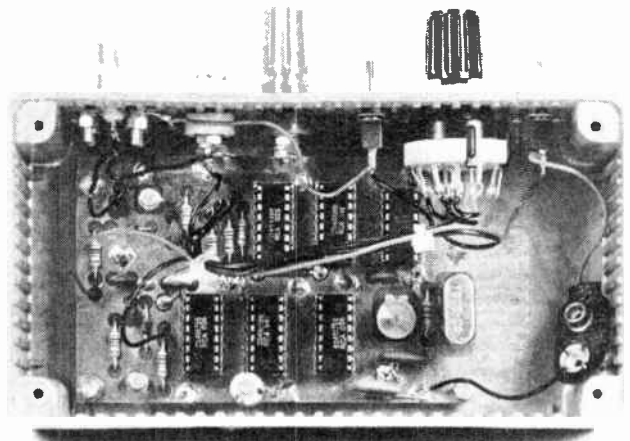
Order

LK63T (Live Wire Det Kit) £2.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 13. See inside back cover of this catalogue.

CMOS CRYSTAL CALIBRATOR



- ★Enables Calibration Of Receivers
- ★Checks The Position Of The Edges Of Amateur Band Allocations
- ★Produces Markers At Switchable Intervals Of 1MHz, 100kHz, 12.5kHz or 10kHz
- ★Low Power Consumption

The crystal calibrator can be used to check the calibration of receivers and be particularly useful for amateur radio operators. This low power consumption calibrator offers switched-interval markers usable up to about 300MHz which can be amplitude modulated with a 1kHz tone, to facilitate calibration, frequency checking etc.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB21X (CMOS Xtal Cibrtr PCB) £2.95

Kit

A complete kit of parts excluding box is available for this project.

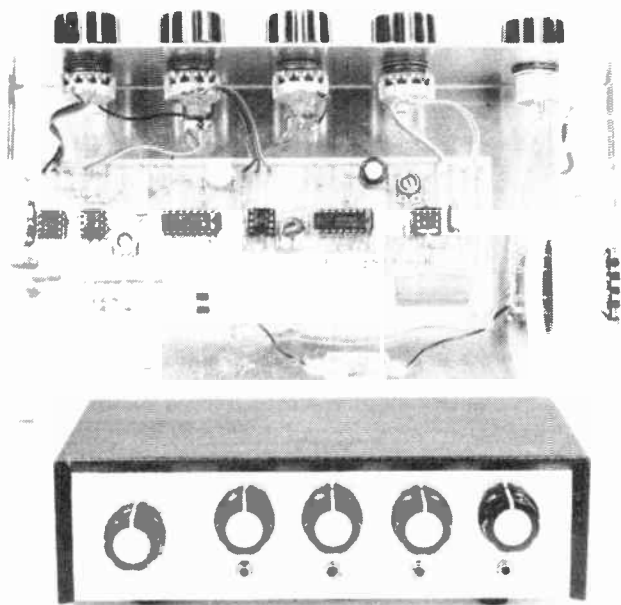
Order

LK10L (CMOS Xtal Cibrtr Kit) £21.95

Construction Details

Full construction details may be found in the Maplin Projects Book 7. See inside back cover of this catalogue.

SWEEP OSCILLATOR



- ★ **Rapid Frequency Response Checks**
- ★ **Adjustable Sweep Speeds - 0.2Hz To 10Hz**
- ★ **Interconnection To Oscilloscope Provides Instantaneous Assessment**

The Maplin sweep oscillator provides a fast method of frequency response, assessment and measurement. Its wide range of sweep speeds allows for connection to an oscilloscope to provide an instantaneous display of frequency characteristics. The easy to assemble module is on one pcb providing easy construction.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order	
GB22Y (Sweep Oscillator PCB)	£3.85

Kit

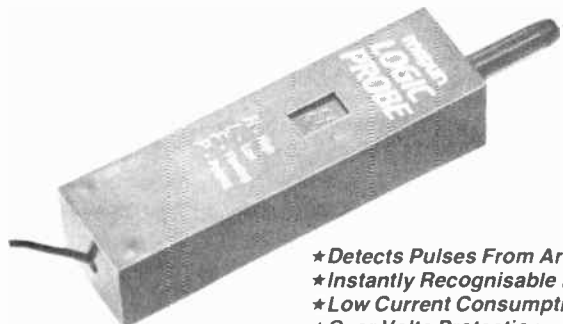
A complete kit of parts (excluding case) is available.

Order	
LK06G (Sweep Osc Kit)	£24.95

Construction Details

Full construction details may be found in the Maplin Projects Book 7. See inside back cover of this catalogue.

LOGIC PROBE



- ★ **Detects Pulses From Around 1Hz**
- ★ **Instantly Recognisable Logic States**
- ★ **Low Current Consumption**
- ★ **Over Volts Protection**

Although countless designs have appeared for Logic Probes, the Maplin probe offers facilities normally found only on expensive probes. The main difference between this logic probe and others is that the output is shown on a seven segment LED display, as a letter of the alphabet: H for High; L for Low; F for Floating; P for Pulsing. In this way, the logic state is instantly recognisable and totally unambiguous unlike some commercial logic displays. The use of a special high efficiency display means that the total current consumption at a supply voltage of 15V is only 15mA — quite suited to battery operated circuits. In addition

the probe is protected against over voltage inputs and reversed supply. As well as detecting High and Low logic states, open circuit (floating input) and pulsing inputs are displayed. Pulse trains from around 1Hz are detected as a pulsing input, the upper limit is above that attainable in most common CMOS logic. The two pcb construction, and straightforward design make this probe highly competitive with those costing substantially more.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Order	
GB30H (Probe Upper PCB)	98p
GB31J (Probe Lower PCB)	98p

Case

A pre-punched and printed black plastic case with probe and fittings is available for the Logic Probe.

Order	
FJ37S (Logic Probe Case)	£1.48

Kit

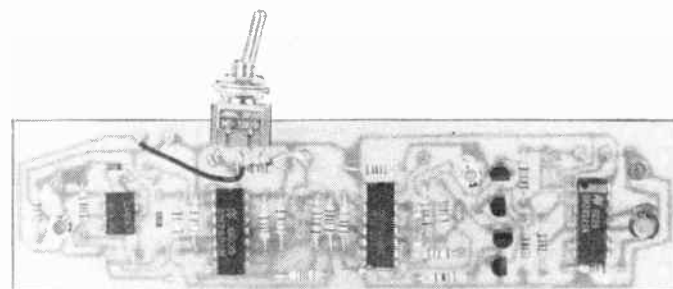
A complete kit of parts including the case is available for this project.

Order	
LK13P (Logic Probe Kit)	£12.95

Construction Details

Full construction details may be found in the Maplin Projects Book 8. See inside back cover of this catalogue.

LOGIC PULSER



A logic tester designed to inject pulses directly into a digital circuit in order to test the functions of logic IC's in situ on the board. A high current output is used to 'overcome' the output stage of the preceding logic element that is connected to the input(s) of the device under test, but is of very short duration, thereby protecting the preceding stage from any damage. The output of the Logic Pulser is normally at a high impedance, but when required to generate a pulse, it firstly goes to logic '0', then logic '1', finally returning to its high impedance condition. This has the effect of 'toggling' the input of the gate under test, thus ensuring some sort of reaction regardless of which logic state the gate input was previously being held at. The pulser can also produce continuous pulses at 50Hz, useful for checking counters, etc. It requires a 5V DC supply at 25mA, which can normally be derived from the equipment under test. An LED indicator is provided to show that a pulse has been generated, or alternatively a stream of pulses.

Printed Circuit Board

Order	
GB36P (Pulser PCB)	£1.45

Kit

A complete kit of all parts is available.

Order	
LK19V (Logic Pulser kit)	£5.95

Construction Details

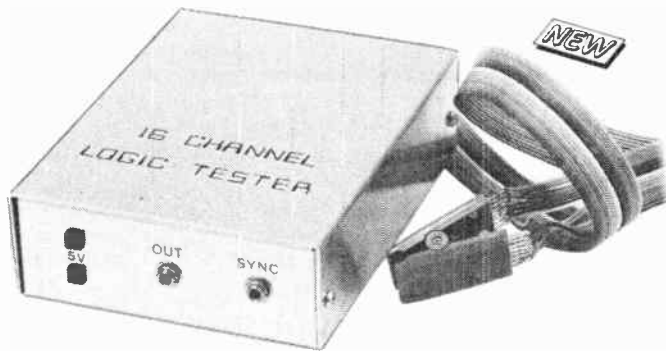
Full construction details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

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SIXTEEN CHANNEL LOGIC TESTER



- ★ Simultaneous Testing of up to 16 IC Pin-Outs
- ★ All 16 channels Displayed on Your Oscilloscope Screen
- ★ Easy to Construct

While logic circuits are in many ways very simple, having just two stable signal states, they can nevertheless be quite difficult to test. The point in the circuit where the fault lies may show clear signs of incorrect operation with perhaps a static logic level where there should be a pulse stream or an indeterminate DC level, rather than a proper logic 0 or logic 1 potential. However, there are often a vast number of points in the circuit that must be checked one by one in order to trace the point where the fault exists. This oscilloscope add-on will speed up fault finding on digital equipment by enabling a number of pin-outs of an IC (up to 16) to be monitored simultaneously.

This instrument has an integrated circuit test clip which fits onto 14 and 16-pin DIL integrated circuits, and couples the signals on the pins through to an oscilloscope interface unit. The interface combines the signals so that they produce a simple histogram display on the screen of the oscilloscope, and the signal level for each pin can be seen at a glance. If a pin has a pulse signal and is not static, this shows up as an unstable area of display. A 16-line to 1-line decoder is used to produce a single Y output for the oscilloscope, and synchronisation is provided by a 5-bit counter used to strobe the demultiplexer.

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GB98G (IC Logic Tester PCB) £2.95

Kit

A complete kit of parts to build this project excluding connectors and cable.

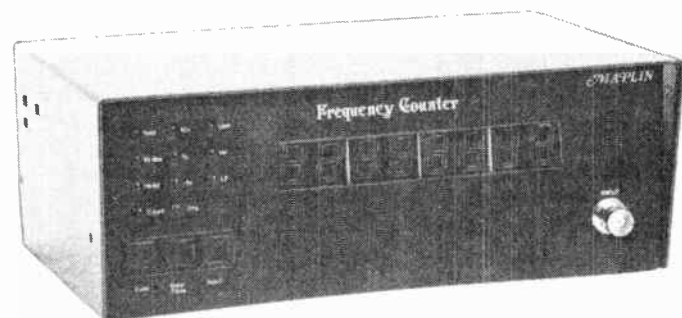
Order

LK77J (Scope Logic Tstr Kit) £11.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 16. See inside back cover of this catalogue.

8-DIGIT FREQUENCY COUNTER



Features:

- ★ Ranges from 10Hz to 600MHz
- ★ Mains or 12V DC operation
- ★ Clear 8-digit display
- ★ Easy to Build - only two interconnecting wires

This frequency counter offers a superior specification for the first time in kit form. The design is based on the Intersil ICM7216D, and includes electronically switched ranges for greater reliability and ease of construction. Provision has been made for possible future extensions, so this kit can be considered truly flexible. The integrated circuits used are of an extremely advanced and sophisticated design, including CMOS, ECL and Schottky TTL. The display uses multiplexed large red 7-segment LED's for easy viewing. The functions and ranges are

★ All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

selected by computer-style key switches and displayed on rows of different coloured LED's. The input is a single BNC socket and is switched automatically to the correct input amplifier. The counter will run off either an internal or an external reference oscillator, of either 1MHz or 10MHz (programmable). The power supplies are fuse protected on both DC and AC inputs. This is a complex project and is not recommended for beginners.

The following parts used in this project are not described elsewhere in this catalogue.

Front Panel

An attractive printed and punched aluminium front panel.

Order

RK39N (Freq Cnt Front Panel) £2.75

Printed Circuit Boards

Order

GB02C (Frequency Counter PCB) £5.95

GB03D (Freq Ctr Display PCB) £2.45

Kit

A complete kit of all the parts you need including case and front panel.

Order

LW79L (Frequency Counter Kit) £99.95

Construction Details

Full construction details may be found in the Maplin Projects Book 4. See inside back cover of this catalogue.

FREQUENCY METER ADAPTOR



This simple and inexpensive adaptor will make your Digital Multimeter into a Frequency Counter or DFM, which essentially covers the AF band most used by amateur constructors. Using the LM2917N frequency to voltage converter IC, the adaptor will enable the meter to directly read frequencies from 0.1Hz to 9kHz in four ranges. Since the output of the adaptor is in voltage units it can be used with analogue multimeters as well, provided a suitably low DC voltage range, up to or including 1.999V DC, is available. If the meter's full scale deflection in volts is less than this, then the full scale value of each frequency range will be correspondingly lower, for example, 1.5V DC fsd = 1.5kHz, etc. The accuracy of the final readings is largely dependent on the quality of the meter used and the accuracy with which the adaptor unit is calibrated, but the results should be more than adequate for most audio frequency tests. Uses two PP3 6V batteries.

A printed circuit board is available, or a complete kit of all parts excluding the case.

Printed Circuit Board

Order

GB40T (Frqncy Mtr Adptr PCB) £1.45

Kit

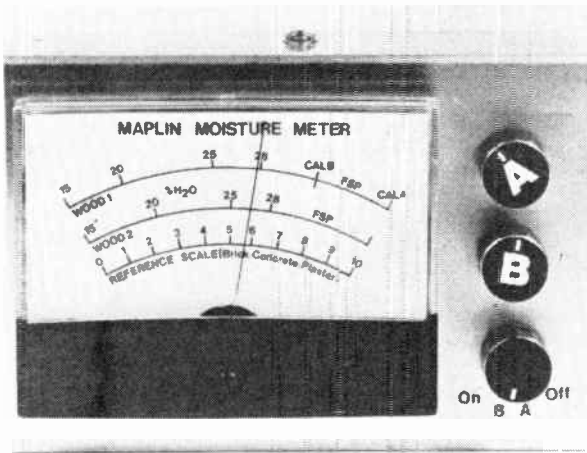
Order

LK20W (Frqncy Mtr Adptr kt) £9.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

MOISTURE METER



- ★ **Low Cost**
- ★ **Simple To Use**
- ★ **May Be Used On Wood, Brick, Plaster etc.**
- ★ **Built-in Calibration**

This meter has a function similar to damp meters of the type used by surveyors and builders. Its chief use is to detect dampness and rot in buildings so that immediate remedial measures can be taken before irreparable damage occurs. Other uses include determining whether a wall is in a suitable condition for hanging wallpaper or painting. Full details are given in the article on how to interpret the readings you will obtain with various different materials.

Moisture Meter Scale

A printed scale that will fit into our Large Panel Meter. The scale is calibrated for various materials.

Order

BK67X (Moisture Scale) 20p

Construction Details

Full construction details may be found in the Maplin Projects Book 6. See inside back cover of this catalogue.

MAPLIN MODEM



- ★ **Communicate With Thousands Of Other Computer Users**
- ★ **Easy Construction — Just Two PCB's**
- ★ **CCITT Standard**
- ★ **Easy Set-Up Procedure**
- ★ **300-Baud**
- ★ **Full Duplex**
- ★ **Loop-Back Test Modes**
- ★ **Direct Connection Type Using BT Approved Transformer**
- ★ **Extremely Low Error Rate**

This modem enables a home computer to communicate with any other computers using standard 300-baud CCITT tones over a telephone system. This means an easy exchange of computer programs with other users and the ability to communicate with any other computer regardless of make using a 300-baud standard modem and even direct access to Maplin's computer to use our Maptel and Cashtel services. By using specialised IC's the modem converts the computer data into audio tones for transmission down the telephone line. So that data can be sent in both directions, four different frequencies are used, two for each direction.

In order that two modems can communicate one must be switched to the originate mode, which transmits 980 and 1180Hz, and the other must be switched to the answer mode and transmits 1650 and 1850Hz. Each modem receives the alternate pair of frequencies to those which it transmits. Direct connection to a telephone line is safe and easy via a British Telecom approved transformer. However your computer must have an interface to enable it to communicate with the modem and a program to turn the computer into a 'dumb terminal'. Some computers already have a suitable interface, the BBC for example needing only the program on page 18 of this catalogue. Interfaces for several other popular computers are described in the following pages. Interfaces so far available are for ZX81 (including conversion to standard ASCII ROM), Spectrum, Dragon, Oric, Sharp MZ80K, VIC20 and Commodore 64 and all these projects include the necessary program.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Boards

Order

GB09K (Modem Main PCB) £4.95
GB10L (Modem PSU PCB) £1.50

Case

A very attractive case for the Maplin Modem finished in dark blue. Front and rear panels are matt black with a white legend. This case will give your modem that professional look.

Order

YK62S (Modem Box) £10.95

Kit

A kit of all the parts excluding the case is available for this project.

We regret that it is not possible for a kit to be approved for connection to the BT system, so those of you who are concerned that BT's monopoly should be inviolate are effectively prevented from constructing telephone accessories at home.

PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting this apparatus.

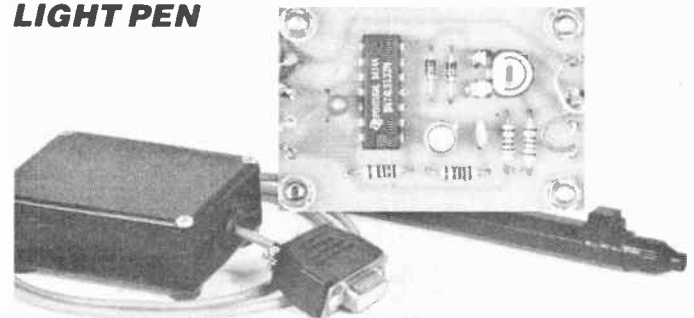
Order

LW99H (Modem Kit) £49.95

Construction Details

Full construction details may be found in the Maplin Project Book 5. See inside back cover of this catalogue.

LIGHT PEN



A useful device when added on to a home computer and VDU or TV monitor combination, whereby a control loop may be created from the image on the VDU to the computer in order to initiate changes to the screen image, by-passing the keyboard in the process. In this way a Light Pen may be used to physically draw images on to the screen, to select, by pointing the pen, from a menu of options, or, depending on a suitable program, anything else where extensive and repeated operation of the keyboard starts becoming a cumbersome process. Commercially manufactured Light Pens are rare, and expensive for the hobbyist. It wouldn't be so bad if they were to offer value for money, but this isn't always so. This light pen project offers high quality for half the cost, leaving the only remaining problem of the rarity of software. Some simple starting programs for the Atari are illustrated along with the constructional notes. This light pen is suitable for use with Atari, VIC20, and the Commodore 64 computers.

The following list of items are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB74R (Light Pen PCB) £1.25

Kit

A complete kit of all parts excluding pen case is available.

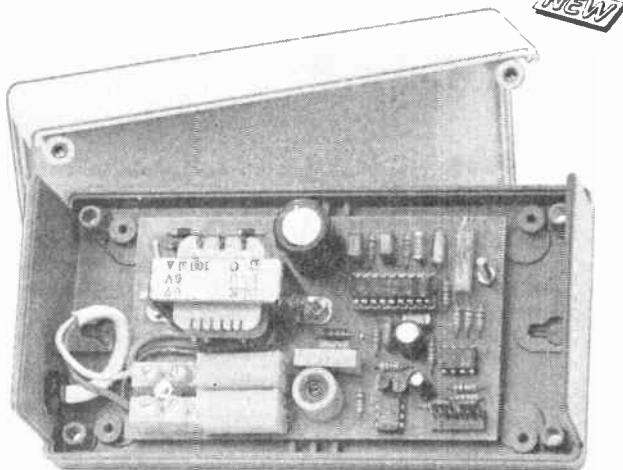
Order

LK51F (Light Pen Kit) £8.95

Construction Details

Full constructional details may be found in the Maplin Projects Book 12. See inside back cover of this catalogue.

MAINS Tx/Rx MODULE



- ★ Transmits or Receives Serial Data over 240V AC Mains Wiring
- ★ Transmission Rates up to 4.8k Baud
- ★ Suitable for Computer Data Links and Security Systems

Mains wiring is a convenient medium for connecting intercommunications devices over short distances on the same phase using a high frequency carrier. As an example, triacs used for power and light control, transmit a high level of switching noise down the mains wiring, as do motors and pumps when first switched on. In a similar way the Mains Tx/Rx can form an interface between communicating equipment and the mains (at least two are required to make a working link). It is not a complete encoding/decoding system with protocol and handshake, but the communicating devices can be of any type, e.g. alarm systems, RS232 keyboards or TTL serial outputs from micro computers.

The mains voltage is isolated from the driver electronics and a modulated carrier signal applied to both LIVE and NEUTRAL cables. In a domestic situation, several ring mains systems would be terminated at the consumer fuse panel and the carrier would be transmitted through to all socket outlets in the house. The maximum data frequency able to be carried on any ring main is determined by the impedance and noise of the line.

Tests in a factory environment have produced good results over hundreds of feet with RS232 and TTL computer communications up to 4800 baud, although this cannot be guaranteed in every case!

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GB84F (Mains Tx/Rx PCB) £3.95

Kit

A complete kit of parts for this project is available and includes case and hardware, but does not include cable, plugs and sockets.

Order

LK68Y (Mains Tx/Rx Drvr Kit) £29.95

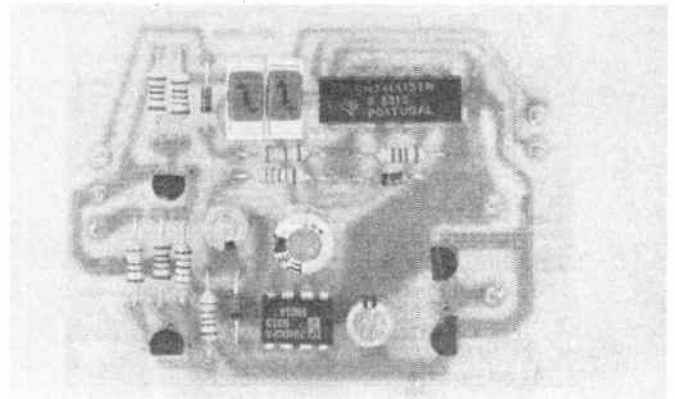
Construction Details

Full constructional details may be found in the Maplin Magazine Issue 16. See inside back cover of this catalogue.

RS232/TTL CONVERTER

Telephone links, via modems, make intercommunication between microprocessors possible by using what is called the RS232 standard. Unfortunately, not all microprocessors are readily compatible with the +/- 12V levels of RS232. This module provides for converting the 5V TTL signals to RS232 levels and vice versa.

★ All prices include VAT ★ Price charged will be that current on the day of despatch. See prices on page 15.



The following items used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB26D (TTL/RS232 Conv.PCB) £1.45

Kit

A complete kit to build the pcb is available.

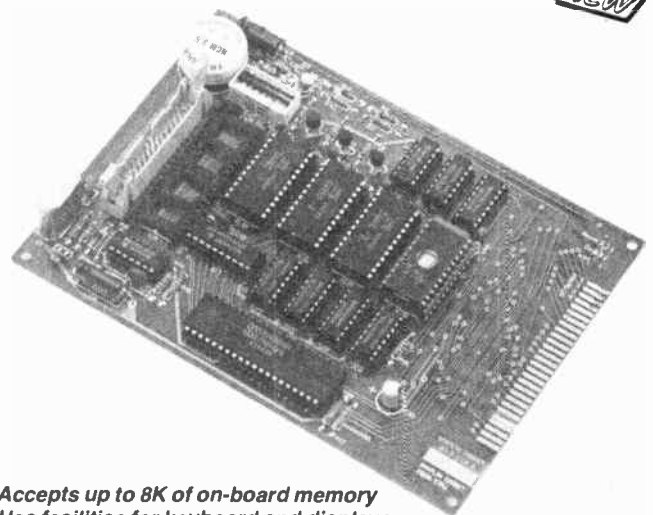
Order

LK17T (RS232/TTL Cnvrtr kit) £8.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

Z-80 CPU MODULE



- ★ Accepts up to 8K of on-board memory
- ★ Has facilities for keyboard and displays
- ★ 4 decoded I/O select lines
- ★ Battery back-up available for CMOS RAMS

The Z80 microprocessor has been with us for many years and is still proving successful, with many new computer developments giving evidence of this fact. Practical applications of the CPU require a module with memory, Input/Output, clocks and facilities for further expansion.

The Maplin CPU Module can accept up to 8K of memory which is decoded in 2K (2048 bytes) blocks. The first block contains the operating system in ROM or EPROM and the second, third and fourth blocks can be either RAM or ROM. Static or CMOS 2K RAMS may be fitted (totalling 6K) and battery back-up is available, via switches, for CMOS data retention, if required. Both Z80 or Z80A processors can be fitted, and the system clock has facilities for different size crystals to suit, e.g., 1MHz crystal for Z80 or 2.4576MHz crystal for Z80A.

A keyboard/display decoding IC can be fitted allowing for small key or large (64-key) type keyboards (or sensors) for data input. This IC can also drive seven segment LED displays. This interface can scan up to 64 keys – expandable to 128 with suitable decoding – and sensors or strobed keys may be used. Two key lockout and 'N' key rollover can be programmed, and keyboard entries generate an interrupt (NMI) to the Z80. Either four or eight (programmable) 7 segment displays can be added with blanking facilities, and all connections are made via a 26-pin IDC socket.

Four decoded I/O select lines are available and all data and address lines are buffered before being brought out to an expansion edge connector. All of the Z80 control lines are available, most of which are buffered, including a system CLOCK output, RESET output, SYSTEM RESET input and a switched NMI input. The NMI can be taken from either the KBd/display interface or directly from the expansion connector.

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GB86T (Z80 CPU Module PCB) £10.95

Kit

A kit for this module is available, but does not include connectors, crystal, keyboard/display I/F IC, EPROM or RAM chips.

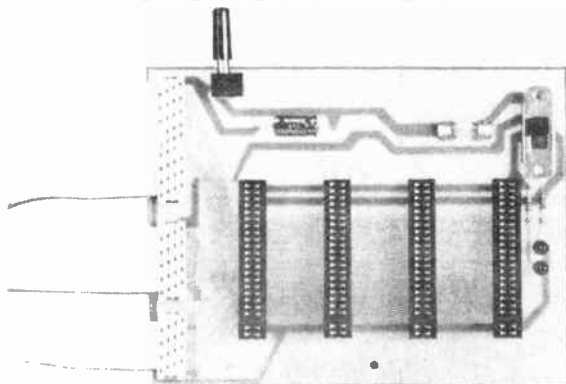
Order

LK67X (Z80 CPU Module Kit) £27.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 15. See inside back cover of this catalogue.

BBC MICRO MOTHERBOARD



A Motherboard for the BBC Micro which overcomes the problem that the location of the 1MHz bus and user port is underneath the computer. This motherboard brings out both these ports as well as the Analogue Input to 4 parallel double-sided edge connectors, which can be located in front or behind the computer when in its working position. Power switching and protection is also provided.

The following list of parts are described nowhere else in this catalogue.

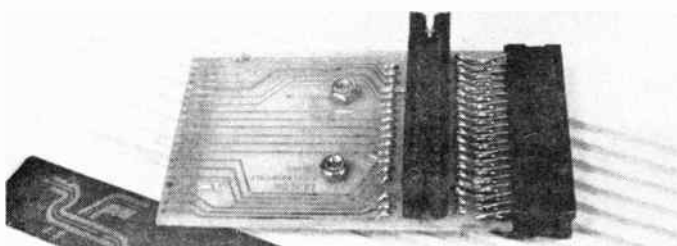
PCB, Kit and Construction Details

A complete kit of all parts. Full constructional details may be found in the Maplin Projects Book 11. See inside back cover of this catalogue.

Order

GB39N (BBC Motherboard PCB) £4.95
LK47B (BBC Motherboard Kit) £25.95

DRAGON 32 EXTENDI PORT



A plug-in board to extend and duplicate the cartridge socket of the Dragon 32. The Extendiport allows two (2 x 20 way) socket extensions or one socket and one open PCB edge connector to be available for use with peripheral devices.

The following items are not described elsewhere in this catalogue.

Printed Circuit Board

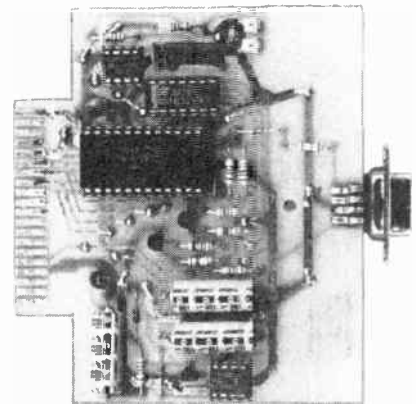
Order

GB56L (Drgn ExtendiPORT PCB) £3.45

Construction Details

Full constructional details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

DRAGON 32 MODEM INTERFACE



★RS232 Data Link

★Allows Connection To Maplin Modem

★Programmable Word Format

The first in a series of projects for the Dragon 32 computer is this Serial Communications Interface Adaptor. Although primarily designed for use with the Maplin Modem, this SCIA could connect to any serial RS232 compatible system where data exchange is required. It makes possible full communication between the Dragon and other computers and many commercial information services including Maptel. The easy to construct pcb plugs into the Dragon ROM expansion socket allowing simple connection and disconnection.

The following parts used in this project are not described elsewhere in this catalogue.

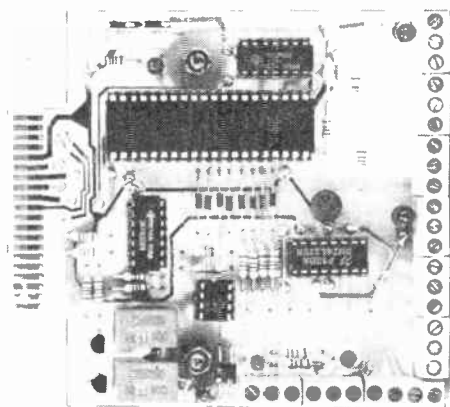
PCB, Kit and Construction Details

A complete kit of parts is available for this project. Full construction details may be found in the Maplin Projects Book No. 8. See inside back cover of this catalogue.

Order

GB29G (Drgn/RS232 Intfc PCB) £3.95
LK12N (Drgn/RS232 Intfc Kit) £14.95

DRAGON 32 I/O PORT



★Two 8-Bit Ports With TTL And Tri-State Compatibility

★Four Norm/Inv Latched Ports

★Two Opto And Two Relay Switched Ports

★Fully Programmable From BASIC Using PEEK And POKE

Our port interface module allows the Dragon 32 to communicate with external devices such as micros, domestic electrical systems, i.e. central heating and security control, or peripheral control of the computer. Inout/output ports consist of eight terminals, each of which can access the computer data bus. Information is passed along the bus, to or from the Central Processing Unit (CPU) by enabling the port with appropriate control signals. POKEing data in decimal form (0 to 255) will result in an eight bit binary code being written to the port, whilst PEEKing will read presented information and take action according to program requirements. The ready etched pcb allows for straight-forward construction, with minimal set-up procedures.

The following parts used in this project are not described elsewhere in this catalogue.

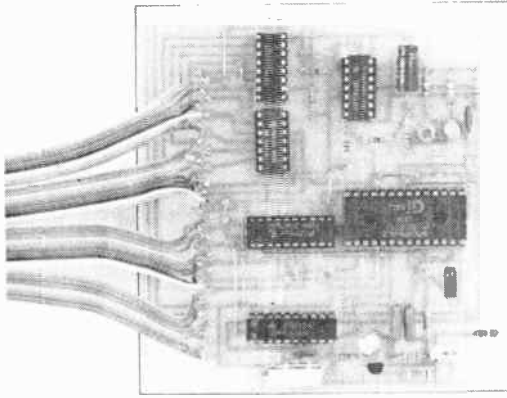
PCB, Kit and Construction Details

A complete kit of parts for this project is available. Full construction details may be found in the Maplin Projects Book No. 8. See inside back cover of this catalogue.

Order

GB37S (Dragon I/O PCB) £4.45
LK18U (Dragon I/O Port) £16.95

ORIC TALKBACK



A speech synthesiser for the Oric 1 Computer, which in common with other Maplin 'Talkback' projects uses the GI SP0256 speech chip. The chip produces a number of short sounds known as 'allophones' which can be strung together to form complete words. Although this method is somewhat more difficult to use than that of a system which generates whole words, and the speech quality is not quite as good, it does however have an unlimited vocabulary. The required phrases can be produced by using a short program that takes up very little memory space. The module connects to the expansion and cassette ports at the rear of the Oric, and derives power from the computer itself and uses the machine's own internal loudspeaker. A copy of the article on Allophones which appeared in issue 6 of Electronics is included in the kit.

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GB45Y (Oric Talkback PCB) **£2.95**

Kit

A complete kit of all parts for the Oric Talkback is available.

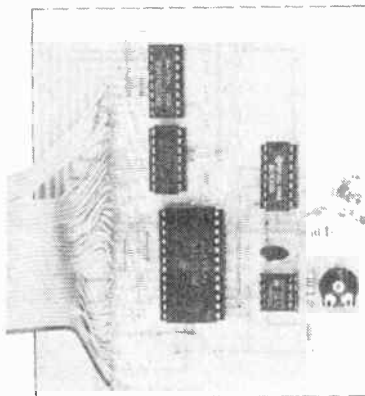
Order

LK28F (Oric Talkback Kit) **£19.95**

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

ORIC 1 MODEM INTERFACE



A simplified RS232C interface enabling the Oric 1 to be used with the Maplin Modem. It does not require a separate mains power supply as it is powered from the Oric's own supply. However, in order to use the Oric 1 with any other RS232C equipment suitable level shifting circuitry needs to be added, such as the Maplin TTL/RS232C Converter.

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board and Kit

Order

GB55K (Oric Ma-Mo I/F PCB) **£3.95**
LK40T (Oric Maplin Mo I/Face) **£11.95**

Construction Details

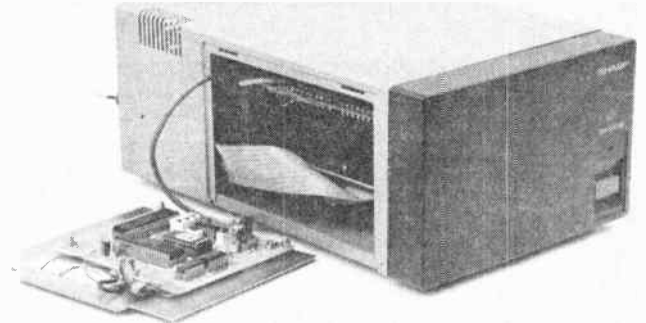
Full constructional details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

SHARP MZ-80K SERIAL INTERFACE

The ZX81 Serial Interface finds a new lease of life for Sharp MZ-80K owners and with a few modifications, this project can be made to function with the MZ-80 I/O extension system. A kit of parts is available, containing a new translator ROM, and one or two other component changes. The original ZX81 interface project can be found in Project Book 7.

The original circuit used memory mapped I/O but it is a lot easier with the Sharp to use the Z-80 I/O ports (there are plenty of spare addresses) as all the necessary signals are available and this is where the MZ-80K version is different.

NEW



The following are not shown anywhere else in this catalogue.

EPROM

A pre-programmed EPROM used on the I/F PCB.

Order

QY72P (2716/M9 EPROM Shp I/F) **£4.95**

Kit

A complete kit of all parts to build this project is available excluding cable and screws, nuts and fixings. The kit is based on the ZX81 serial I/F kit.

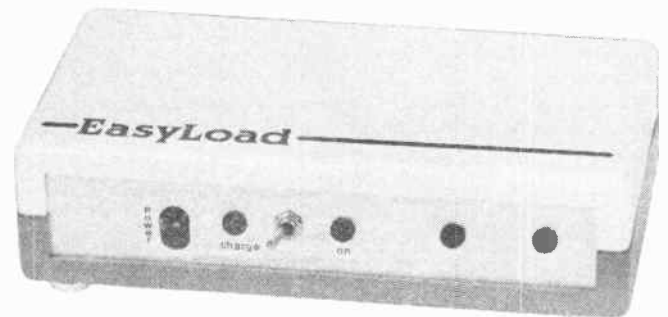
Order

LK71N (Sharp Serial I/F Kit) **£26.95**

Construction Details

Most of the constructional details may be found in the Maplin Project Book 7, (ZX81 Serial I/F). The modifications necessary for use with the Sharp MZ-80K are contained in the Maplin Magazine Issue 15. See inside back cover of this catalogue.

SPECTRUM EASYLOAD



The Easyload overcomes a problem experienced with the ZX Spectrum when using a cassette recorder to Save and Load data. In the majority of recorders the 'mic' input signal generally appears at the 'earphone' output during recording, usually after amplification by the recording amplifier, thus providing a monitoring facility when recording audio. However, if such a machine is used for tape storage for the ZX Spectrum a closed feedback loop is created during recording because the Spectrum's 'mic' and 'ear' ports are effectively coupled together through internal circuitry. The Easyload provides changeover switching between the recorder and the Micro which selects either 'mic' or 'ear' leads separately, plus a facility for loading from a second tape deck. The unit also provides correct AGC and signal improvement circuitry so that cassettes always LOAD and SAVE easily.

The following list of parts are not described anywhere else in this catalogue.

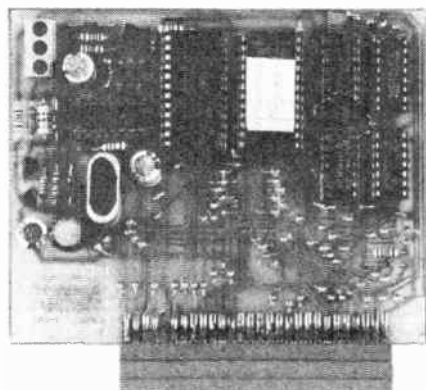
PCB, Kit and Construction Details

A complete kit of all parts excluding case and Plugpak Q. Full constructional details may be found in the Maplin Projects Book 10. See inside back cover of this catalogue.

Order

GB57M (Spectrm Easyload PCB) **£3.45**
LK39N (Spectrm Easyload Kit) **£10.95**

SPECTRUM RS232 INTERFACE



- ★ Connects the Spectrum to modems or other computers
- ★ RS232 compatible — 300/2400 Baud rates
- ★ Completely self-contained operating system — no programming LOADING or SAVING required!
- ★ Plugs into expansion socket or motherboard

For computers to communicate with external sources suitable interfaces must be used. These must have the necessary facilities to enable compatibility with both devices to be under software control. Our series of computer/modem interfaces continues with one for the Spectrum, which can be operated directly from BASIC, without typing or LOADING lengthy program listings. Access to (or exit from) the module may be initiated as required, either directly from switch-on or during a normal program run, without changing any previous contents of memory except the display file, and does not require RAM space to operate. The easily constructed PCB allows for simple building, with minimal set-up procedure.

Printed Circuit Board and EPROM

A ready programmed EPROM is available separately for this project.

Order

GB42V (Spectrum/RS232 PCB)	£3.95
QY57M (2716/M7)	£5.95

Kit and Ready Built Module

A complete kit of parts for this project is available. It is also available as a ready-built and tested module.

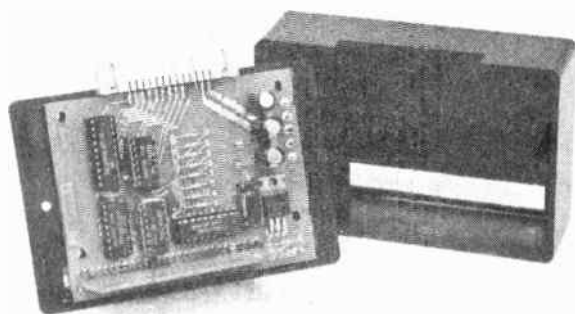
Order

LK21X (Spectrum/RS232 Intf kt)	£19.95
YM29G (Spectrum RS232 IF Ass)	£22.95

Construction Details

Full construction details may be found in the Maplin Projects Book 8. See inside back cover of this catalogue.

SPECTRUM I/O CONTROLLER



- ★ Buffered 2 Way 8-Bit Data Bus
- ★ 8 Control Lines
- ★ Access made Via Keyboard 'IN' and 'OUT' Commands or from Machine Code

Prompted by the many requests received from our customers for a series of interfaces allowing add-on expansion to the Spectrum computer, the I/O Controller module is offered to achieve this. Although not a programmable parallel/serial device in itself, the I/O Controller will decode 8 independent select control lines with data bus access via a bi-directional buffer. Buffered read and write lines are also available, thus establishing CPU protocol during I/O time.

It is intended that the controller be used with latch modules, serial interfaces and speech/sound generators which will be available from Maplin, designed as an expandable system to extend the Spectrum's capabilities. Many other commercial add-on's could be controlled by this module, especially in the field of Robotics.

The following items are not described anywhere else in this catalogue.

Printed Circuit Boards

Order

GB80B (Spectrum Control PCB)	£5.75
GB81C (Pin Extension PCB)	£1.85

Kit

A complete kit of all parts is available.

Order

LK65V (Spectrum I/O Cntrlr Kt)	£16.95
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Ready Built Module

This project is also available as a ready built and tested module.

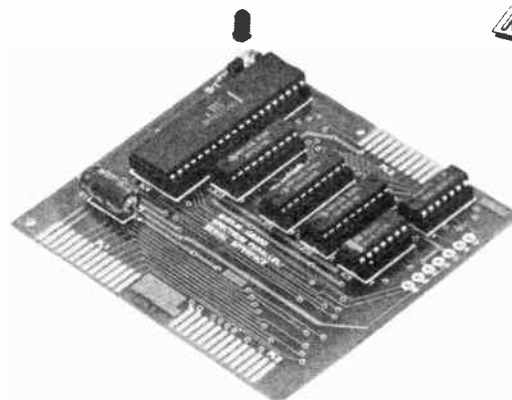
Order

YM31J (Spectrum I/O Cntrlr Assm)	£18.95
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Construction Details

Full constructional details may be found in the Maplin Magazine Issue 14. See inside back cover of this catalogue.

SPECTRUM PARALLEL/SERIAL PORT



- ★ 8-Bit Input and Output Ports for parallel Transfer
- ★ UART Programmable for 5 to 8-Bit Word Serial Data Transfer
- ★ Connects directly to the Maplin Spectrum Input/Output Controller Module

Continuing our series of add-ons for the Spectrum, presented here is a general purpose parallel/serial system for expanding the computer via our I/O controller module — kit LK65V (details in the Maplin Magazine Issue 14). The 8-bit input has an associated control line which can be used to hold presented data, and the other 8-bit output port has an extra latching 9th bit, for flag or strobe purposes. This module connects to the controller module via a 26-way IDC plug and cable assembly (not included in kit), and allows further expansion to the controller via a second port if required. Connections to the board can be either 0.1in. edge connectors, standard 'D' series with sockets mounted on the board or IDC header plugs. The programmable UART serial port transmits and receives data at TTL levels with 5 to 8-bit word formats, 1 to 2 stop bits and full parity control. Baud rates for both Tx and Rx are determined by external clock oscillators, which have not been included on the module. The Serial port is only TTL compatible and so if RS232 levels are required, the RS232/TTL level converter kit (LK17T) is also needed. Full test procedures for checking out the completed module are supplied with the kit and the ports can be easily accessed from BASIC.

The following items are not described anywhere else in this catalogue.

Printed Circuit Board

Order

GB95D (Spectrum Sr/Pr I/F PCB)	£7.45
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Kit and Module

A complete kit for this project is available, but does not include alternative connectors, cable, or ancillary modules. The project is also available as a ready-built and tested module.

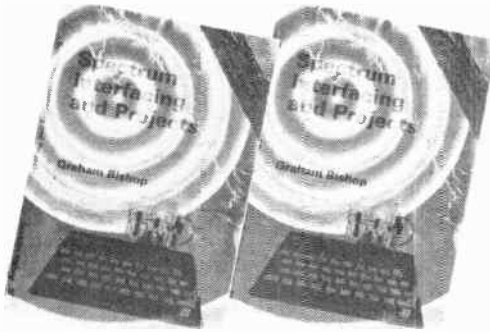
Order

LK72P (Spectrum Parallel/Serial Kit)	£16.95
YM30H (Spectrum Parallel/Serial Assm)	£18.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 16. See inside back cover of this catalogue.

SPECTRUM INTERFACING PROJECTS



Three interfacing projects for the ZX Spectrum to go with the book 'Spectrum Interfacing and Projects' by Graham Bishop. See page 63.

Analogue to Digital Converter

Printed Circuit Board

Order
GB33L (ADC PCB) £2.95

Kit
A complete kit of all parts.

Order
LK26D (Spectrum ADC Kit) £29.95

Digital to Analogue Converter

Printed Circuit Board

Order
GB34M (DAC PCB) £2.95

Kit
A complete kit of all parts.

Order
LK25C (Spectrum DAC Kit) £17.95

Latch

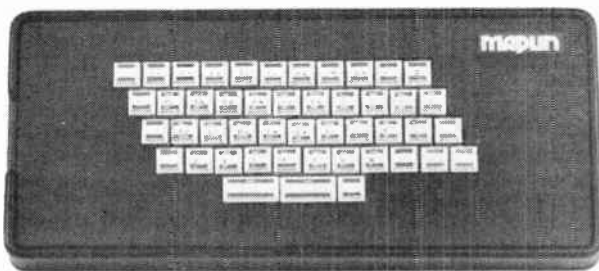
Printed Circuit Board

Order
GB32K (Latchcard PCB) £2.45

Kit
A complete kit of all parts.

Order
LK24B (Latch Card Kit) £5.95

SPECTRUM KEYBOARD



A full size keyboard for the ZX Spectrum which offers improvements over the standard Spectrum keyboard. 47 full size, full travel, positive action mechanical keys with multi-colour legends feature single key 'mode' selection for GRAPHICS, SHIFT LOCK, CAPS LOCK, DELETE and EXTended keyboard. A spare key is provided which can be wired for ancillary functions such as system reset or interrupt. With the addition of one, or two (left and right) right angle D range 9-way plugs, Atari type 'joysticks' can be used allowing faster control of your programs and high speed games. The keyboard connects to the Spectrum by means of an 18-way moulded cable and adaptor unit, which has an extension 2 x 28 way edge connector. Peripheral devices can still be fitted and all Maplin Spectrum projects will function normally with this system.

The following parts list for items used in this project are not described elsewhere in the catalogue.

Keytop Print

A print with cut lines to match the key caps, printed with legends in 3 colours to match the Spectrum's keyboard.

Order
YK77J (Spectrum Keytop Prnt) 50p

Keyboard Case

A black textured finish plastic case with printed front panel with mounting hardware and stick-on feet included.

Order
XG35Q (Spectrum Case) £3.95

Spectrum Keyboard PCB

Order
GB47B (Spectrum Kbd Pcb) £10.95

Adaptor PCB

Order
GB48C (Spectrum Kbd Con Pcb) £1.95

18 Way Jumper Cable

Connects the keyboard to the adaptor unit.

Order
BK86T (18 Wy Jumper Cable) £2.95

Keyboard Kit

A complete kit to build the keyboard (excluding DIL sockets, case and right angle D Plugs.)

Order
LK29G (Spectrum Kybd Kit) £34.95

Adaptor Kit

A complete kit of parts for the adaptor.

Order
LK30H (Sptrm Kybd Adptr Kit) £7.95

Ready Made Keyboard

A ready built keyboard including adaptor and case. The joystick ports option is not included.

Order
XG36P (Assem. Spectrum Kbd) £49.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

ZX81 EXTENDI-RAM

A cheaper alternative to adding 16K or 32K extensions to the ZX81, is to add this ExtendI-RAM module, if only a few K of extra memory is required. The board allows the ZX81 to produce a full screen of characters (32 x 22), and still have memory left over to run a program. There is 1K of RAM on the board, but up to four boards may be used in conjunction with the ZX81 Port Extension Motherboard module (Stock No. GB08J) to provide 4K of additional memory.

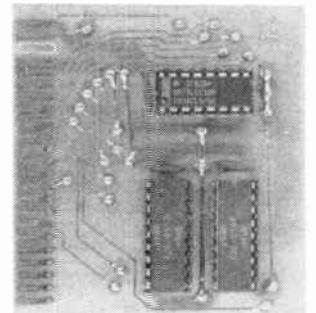
The following items are not shown elsewhere in this catalogue.

Kit

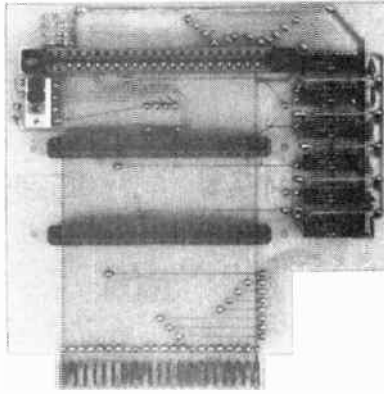
Order
LK16S (ZX81 1K RAM Extnsion) £7.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.



VIC20 EXTENDIBOARD



This project provides a means whereby the VIC 20 can be fully expanded, by simply plugging this Extendiboard into the memory expansion connector of the VIC20. It will immediately provide three expansion sockets, one of which is switchable, and 3K of RAM on the board. This enables, for example, the use of high resolution graphics without substantial loss of memory for programming. Combinations of RAM's can be used to extend memory to the maximum available to BASIC on the VIC20, making it possible to write very long programs or to handle large amounts of data. Other possibilities include the generation of complex sound effects and speech synthesis in BASIC or Machine Code.

The following items are not shown elsewhere in this catalogue.

Printed Circuit Board

Order

GB41U (VIC Extendiboard PCB) £7.95

Kit

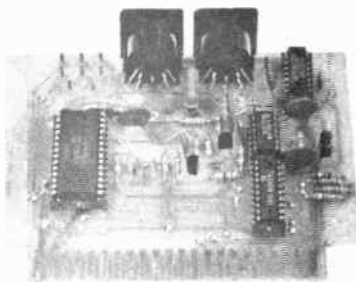
Order

LK22Y (VIC20 Extendiboard) £29.95

Construction Details

Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

VIC20 TALKBACK



A 'plug-in' speech synthesiser for the unexpanded VIC20, enabling the computer to 'talk' in response to a programmed input. A system is used whereby words are put together using allophones — the basic building blocks of speech and offering more alternatives and therefore more realistic speech than the basic phoneme set. The 64 allophones available from the synthesiser can be strung together to form any English word or phrase. The synthesiser is under complete program control and can therefore be used for any application from remote I/O operations to making games sound more realistic. depending on the program used. Speech output is direct to TV and no additional amplification is required.

Printed Circuit Board

Order

GB17T (VIC 20 Talkback PCB) £2.95

Kit

A complete kit of parts is available for this project.

Order

LK00A (VIC 20 Talkback Kit) £19.95

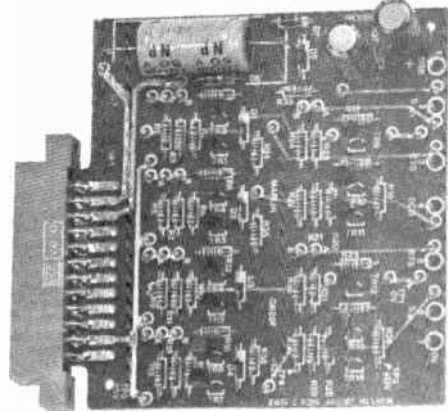
Construction Details

Full construction details may be found in Maplin Project Book No. 6. See inside back cover of this catalogue.

VIC20 RS232 INTERFACE

- ★ Allows VIC To Connect To Modems, Printers, VDU's Or Any RS232 Compatible Device
- ★ Converts TTL Levels To True RS232
- ★ Provides Full Buffering For Protection Of Computer
- ★ Full 'X-Line' Interface Possible As Well As Simple '3 Line' Interface

This device allows interconnection between the VIC20 computer and any device (VDU, Printer etc.) meeting the industrial standard RS232. Thus a wide range of peripheral devices become accessible when the VIC 20 is used with this module. The RS232 interface gives additional protection to the VIC 20 by means of output buffering.



The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB28F (VIC20/RS232 Intfctce)..... £2.95

Kit

A complete kit of parts for this project is available.

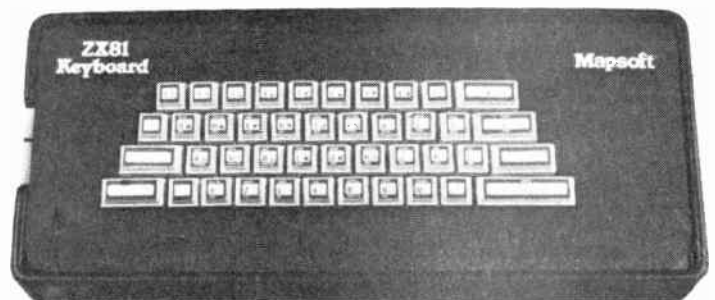
Order

LK11M (VIC/RS232 Intfctce PCN) £9.95

Construction Details

Full construction details may be found in the Maplin Project Book No. 7. See inside back cover of this catalogue.

KEYBOARD FOR ZX81



- ★ Single key selection of Graphic symbols, Function mode and Shift lock
- ★ Full size, full travel, 43-key keyboard
- ★ Two colour legend for keys is the same as the ZX81 keyboard
- ★ Faster, more reliable entry — use it once and you won't be able to do without it again!

An add-on keyboard with full-size keys can offer a great improvement over the existing unit. Operation becomes more positive, unlike the ZX81's touch-keyboard where the only way to be sure you've pressed the key correctly is to check on the screen. With this keyboard the feel is similar to that of a typewriter and thus entry speed is much higher and much more reliable. On the ZX81's touch-keyboard to select a graphic symbol — first the "shift" key must be operated and held and then the "graphics" key operated, then the "shift" key held and the actual graphic symbol required pressed. On this keyboard simply press and release the "graphics 2" key. An LED gives an indication that the mode is selected and the screen cursor changes to [G] as normal. Now any desired graphics symbol may be selected directly without pressing or holding any additional keys. Press and release "graphics 2" key again to return to normal mode. The LED will extinguish and the screen cursor will return to [K] or [L].

On the ZX81's touch-keyboard selecting a function requires a similar operation to selecting a graphics symbol. On this keyboard simply press and release "function" key. The screen cursor changes to [F] and an LED flashes once to indicate that this mode is selected. Now any of the operator keys may be selected directly without pressing or holding any additional keys. After selection the LED is extinguished and the screen cursor returns automatically for normal entry. Finally, this keyboard has a "shift-lock" key that electronically holds the keyboard in shift mode after that key is momentarily pressed. A second LED lights to indicate that this mode is selected. Pressing the "shift-lock" key again extinguishes the LED and returns the keyboard to normal entry mode. Our own experiments have proved that this keyboard is invaluable. No-one who tried it wanted to go back to using the touch-keyboard. Relief from neckache was one often cited advantage! Users described how with the touch-keyboard one looks down to the left or right to read the program to be entered, then at the keyboard to select the key, then up at the TV to check the symbol has gone in, then often, back to the keyboard to roll the finger around a little more because the symbol hasn't been entered (apparently a common occurrence), then up to the TV again, then back to the program. When entering with our keyboard, operators rarely need to move at all. Children who used it, found they could perform complicated operations easily — often they could not do the same thing on the touch-keyboard at all! Everyone agreed that there was no alternative on the market and almost lynched the author to get their hands on the prototype.

The following parts used in this project are not described elsewhere in this catalogue.

Keypoint Print

A print with cut lines to fit the key caps. The print is printed with the legends in red and black to match the ZX81 keyboard.

Order

XH58N (Keypoint Print ZX81) **25p**

Keyboard Case

A black textured finish plastic case with cut-out and printed plastic front panel for the ZX81 keyboard.

Order

XG17T (ZX81 Keyboard Case) **£3.95**

Printed Circuit Board

Order

GA83E (ZX81 Ext Keyboard PCB) **£3.45**

Kit

A complete kit of everything you need, but not including the case.

Order

LW72P (ZX81 Keyboard Kit) **£25.95**

Ready Made Keyboard

The ZX81 Keyboard in its case, ready to plug into the ZX81 Computer. Supplied with full instructions.

Order

XG22Y (ZX81 Keyboard) **£34.95**

Construction Details

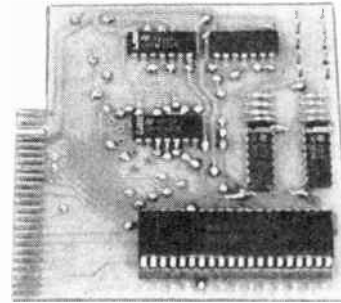
Full construction details may be found in the Maplin Projects Book No. 3. See inside back cover of this catalogue.

NAVIGATION SYSTEM USING ZX81

A complete navigation system for your boat using a ZX81. The system can compare tidal information, wind speed and direction, and water speed and can steer the boat for you. In a yacht, the system will tell you when to tack and the best course to sail allowing for the prevailing wind. The first article in the Maplin Project Book 12, describes how to build the hardware you will need, while the second part, in the Maplin Magazine Issue 13, describes the electronics and contains the program listing. The program commences with a menu of five options. The 'Tides' program calculates the average strength and angle of the tides during the journey. The 'Navigation' program calculates the course and distance through the water and if sailing tells you if it will be necessary to tack. The 'Wind Speed and Direction' program reads the input from the anemometer and direction modules described in part one and displays the details on the screen. The 'Water Speed and Distance' program displays the data from the trailed log (construction details in part one also) on the screen. The 'Steering' program compares all the data being collected and sends instructions to the steering servo interface which instructs the servo to move the tiller. This project is not covered by our 'Get-You-Working Service', although the main electronics part, the Maplin ZX81 I/O Port is. This project should only be attempted by experienced do-it-yourselfers and enthusiasts with a good knowledge of electronics.

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

ZX81 INPUT/OUTPUT PORT



- ★ Two bidirectional ports for a total of 16 input or 16 output lines
- ★ One buffered output port which can interface directly with the MAPLIN digital train controller
- ★ On board address selection allows for expansion to 6 ports with two PCB's

This project for the Sinclair ZX81 will give you access to the outside world with your '81'. The I/O port gives many possible modes of operation. For the purposes of this article examples are given only for the simplest, although the 8255 used here has a total of three programmable operations. Mode '0' provides 3 x 8-bit ports, two of which can be programmed to function either as inputs or outputs, and one (port B), as a buffered output only, which can directly drive the Maplin Digital Train Controller or indeed, many other forms of hardware with a minimum of interfacing.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GA90X (I/O Port PCB) **£2.45**

Kit

A complete kit of all the parts you need except for the test components.

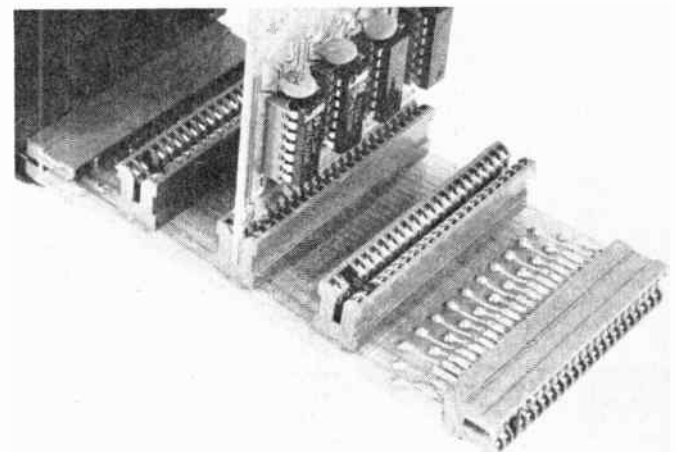
Order

LW76H (ZX81 I/O Port Kit) **£9.95**

Construction Details

Full construction details may be found in the Maplin Projects Book No. 4. See inside back cover of this catalogue.

ZX81 PORT EXPANSION MOTHERBOARD



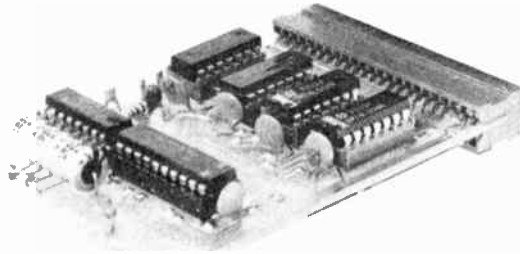
This pcb, plus four 2 x 23-Way PC Edge Connectors (RK35Q, NOT supplied), simply plugs into the I/O Port on your ZX81 and provides three sockets for further extension. For example a 16K RAM pack and up to three further boards could be plugged in. The code below is just the pcb, the edge connectors must be ordered separately. Through pcb Track Pins are also required.

Printed Circuit Board

Order

GB08J (ZX81 Extendboard) **£2.95**

ZX81 SOUND GENERATOR



- ★ 3 Programmable Tone Generators
- ★ Noise Generator With Three Pitch Levels
- ★ Separate Attenuators For Noise And Tone Generators
- ★ Direct Connection Into Expansion Port Socket Via Socket (not supplied in kit)
- ★ Entry From PEEK And POKE In BASIC
- ★ Single Address Access

Almost infinite possibilities for sound and noise effects that can be added to your programs for greater realism and added amusement and further program flexibility. For further details see the description of the main IC used in this project — the 76489 — in the Semiconductor Section. The kit requires an external amplifier and speaker.

The following parts used in this project are not described elsewhere in this catalogue.

Printed Circuit Board

Order

GB11M (ZX81 Sound Gen Pcb) £1.95

Kit

A complete kit of parts for this project is available. The edge connector shown in the picture is not included.

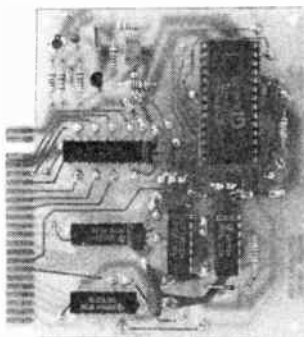
Order

LW96E (Sound Generator Kit) £11.95

Construction Details

Full construction details may be found in the Maplin Projects Book No. 5. See inside back cover of this catalogue.

ZX81 TALKBACK



- ★ Add Speech To Programs
- ★ Allophone Set Provides Unlimited Vocabulary
- ★ Plugs Directly Into Expansion Socket Or Motherboard
- ★ Entry From PEEK Or POKE In BASIC
- ★ Audio Output To External Amplifier Or Our 'Sound On TV'

A single, easy to construct PCB plugs into the ZX81 and provides a flexible speech system. For further details of the system used see the VIC20 Talkback described above and the description of the main IC — SP0256 — in the Semiconductor Section.

The following parts used in this project are not described elsewhere in this catalogue.

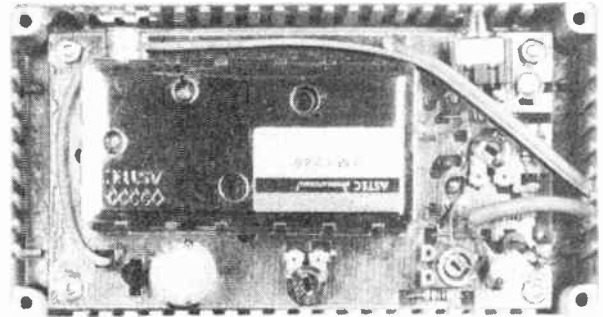
PCB, Kit and Construction Details

A complete kit of parts for this project is available. Full construction details may be found in the Maplin Projects Book No. 6. See inside back cover of this catalogue.

Order

GB18U (ZX81 Talkback PCB) £3.45
 LK01B (ZX81 Talkback Kit) £16.95

ZX81 TV SOUND AND INVERSE VIDEO



- ★ Audio Input For Sound On TV Speaker
- ★ Video Reversing Switch For Normal Or Inverse Video Display
- ★ Can Be Used With Maplin Sound Generator Or Voice Synthesis Modules

This straight-forward project will allow for greater flexibility and reality for ZX81 users. The heart of the project is a module which, when placed between the ZX81 and a TV will allow any sound effects to be heard via the TV's loudspeaker. In addition the project permits an inverse video display if desired.

The following parts are not described elsewhere in this catalogue.

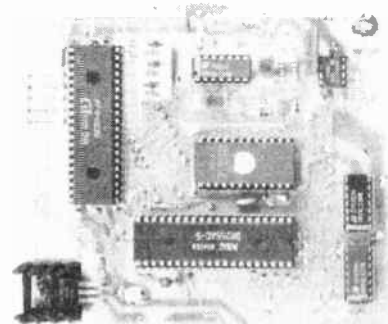
PCB, Kit and Construction Details

A complete kit of parts for this project is available. Full construction details may be found in the Maplin Projects Book No. 6. See inside back cover of this catalogue.

Order

GB14Q (TV Snd/Inv Vid PCB) £2.45
 LK02C (ZX81 TV snd/Inv vid) £21.95

ZX81 MODEM INTERFACE



- ★ Connects ZX81 To Modem Or Other Computers
- ★ TTL/RS232 Compatible
- ★ Plugs Into Expansion Socket Via Motherboard
- ★ 300 Baud Standard Transmission Rate (Adjustable)

The Modem Interface unit allows for easy connection between the ZX81 and the Maplin Modem or alternately between the ZX81 and other peripherals. This will enable two way communication either direct to other computers, or via telephone links to systems such as the Maplin on-line computer. The interface utilises an EPROM code translator for converting ASCII coded signals to ZX code and vice versa, since the ZX81 is not ASCII coded. A program listing is included with the kit.

Printed Circuit Board

Order

GB23A (ZX81 Mod/Intface PCB) £4.95

EPROM

A ready-programmed EPROM for use with this project.

Order

QY52G (2716/M6) £5.95

Kit

A complete kit of parts is available for this project.

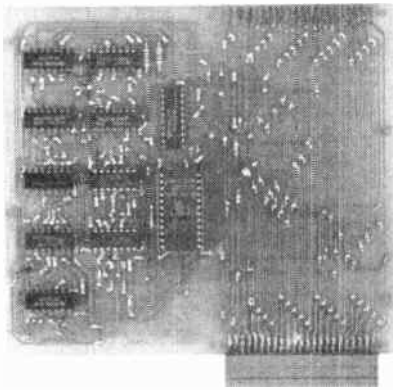
Order

LK08J (ZX81 Modem Intfcae Kit) £29.95

Construction Details

Full construction details may be found in the Maplin Projects Book No. 7. See inside back cover of this catalogue.

ZX81 HI-RES GRAPHICS MODULE



For producing extra high resolution graphics for the ZX81, this board features full 256 x 192 fine pixel display with normal/inverted video, enabling the user to draw lines, circles and triangles, and produce fill-ins and textures. Up to 32 user defined graphics available, operating directly from extended BASIC. The module plugs in at the back of the ZX81, and requires a 16K RAM pack (8K minimum) to plug into the module. There is 2K of ROM pre-programmed with Graphics Routines on the board. Access to the HI-RES screen is made from extended BASIC commands to produce the pixel display and at the same time keep programming very simple for the operator. Characters, numbers or letters can be placed at will anywhere on the display, and both HI/LO RES screens can be SAVED, LOADED or COPYed from BASIC. A pre-programmed ROM as well as a printed circuit board are available separately.

The following items are not described anywhere else in this catalogue.

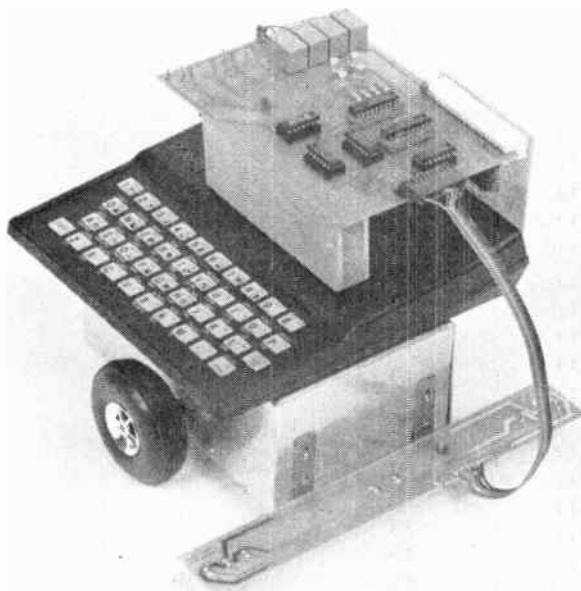
EPROM, PCB, Kit and Construction Details

The pre-programmed EPROM included in the kit is also available separately. Full constructional details may be found in the Maplin Magazine Issue 9. See inside back cover of this catalogue.

Order

QY58N (2716/M8)	£5.95
GB43W (ZX81 Hi Res Grph PCB)	£12.95
LK23A (ZX81 Hi-Res Graphics)	£27.95

TRUNDLE – THE CHANNEL FOUR ROBOT NEW



Strictly a robot of the path-follower variety, the Trundle package consists of an interface and memory expansion board for a ZX81 computer and the extra pieces necessary to make a ZX81 based 'Trundle' robot. The system is supplied in kit form with a comprehensive set of instructions. The interface was designed with the aim of encouraging participation in robotics and allowing other applications of interfacing. This exciting field is often avoided by both software writers as being too complicated electronically and by electronic enthusiasts as being too complicated from the programming angle. However, these fears are not justified. An interfacing project may be as hardware or software intensive as the designer wishes. A lack of skill in the hardware field can usually be made good with an extra piece of software and vice-versa. Trundle was designed to bring the beginner up to a reasonable level of competence with both a computer keyboard and a soldering-iron.

The package itself breaks down into four main sections:- The Interface; The Memory Expansion; The Sensor Board; and The Motor/Chassis Unit. The Interface provides eight input lines and eight output lines, the latter being buffered by relays to enable the direct control of small motors, buzzers etc. The Memory Expansion consists of a CMOS memory board which raises the ZX81's 1k of memory by a further 2k. It also serves to connect the ZX81 to the interface board. The Sensor Board carries Trundle's eyes, an arrangement of infra-red LED's and sensors whereby it detects and locates the edge of the path or maze. In order to stay on course Trundle requires the route or maze to be fairly carefully drawn out, using 3/4in. wide black PVC tape 16cm apart, on a pure white background – a large panel of melamine faced board would be ideal, as the tape can easily be moved and re-used. The Chassis and Motor assemblies provide the base for a self contained structure which will carry the ZX81 computer on the back of the robot itself – and with the additional hardware and a little work to finish, Trundle is ready to go bar programming.

The following parts are not described elsewhere in this catalogue.

Printed Circuit Boards

Order

GB89W (Trundle I/F PCB)	£2.25
GB90X (Trundle Sensor PCB)	£2.45
GB88V (Trundle Memory PCB)	£2.45

Motor Assembly and Hardware

Order

FT41U (Trundle Motor Ass)	£3.99
FT42V (Trundle Wheel)	£1.95
FT43W (Trundle Bracket)	35p

Kit

A complete kit of all parts excluding a D cell size battery is available. Note that a ZX81 computer will be additionally required.

Order

LK62S (Trundle Kit)	£49.95
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Construction Details

Full constructional details may be found in the Maplin Magazine Issue 14. See inside back of this catalogue.

LEAFLETS

The following books and leaflets are published by Maplin. Those marked 'Free' are not shown on our price list and will be sent to you on request. An s.a.e. would be appreciated. However, please note that when you order any book or leaflet, its component schedule is automatically included.

MES12	5600S/3800 Synthesiser Book	XF11M
MES15	Audio Oscillator Leaflet	XH24B
MES15B	Audio Oscillator Component Schedule	XF14Q (Free)
MES16	Car Ignition Leaflet	XH27E
MES16B	Car Ignition Component Schedule	XF15R (Free)
MES35B	50W Amp Component Schedule	XF25C (Free)
MES37	10-Channel Graphic Equaliser Leaflet	XH21X
MES37B	10-Channel G.E Component Schedule	XF06G (Free)
MES41	150W Stereo Disco Leaflet	XF04E
MES41B	Disco Component Schedule	XF05F (Free)
MES42	Light Modulator Leaflet	XH23A
MES42B	Light Mod Component Schedule	XF23A (Free)

All other publications are described with the projects they refer to.

BEST OF ELECTRONICS & MUSIC MAKER PROJECTS VOLUME 1

A compilation of the best projects from E&MM's first year in one 64-page book. The projects included are Continuity Tester, Power Controller, Car Ignition Timing Strobe, Car Battery Monitor, Car Aerial Booster, Car Digital Tachometer, Hi-Fi Sub Bass Woofer, MOSFET Amplifier, Partylite, Syntom Drum Synthesiser, Synwave, Synclock, Direct Inject Box, Noise Gate, Noise Reduction Unit, Guitar Tuner, Harmony Generator, Hexadrum, Quadramix, Volume Pedal and Auto Swell.



Order

XH61R (E&MM Projects Vol 1)	£1.00NV
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Electronics THE MAPLIN MAGAZINE

This quarterly magazine is available on subscription or from any good newsagent. It is published on the second Friday of every third month commencing November (i.e. November, February, May and August). Past issues are available while stocks last, then the projects from the issues are reprinted in the form of Project Books. Order a subscription now and we will deliver the next four issues of the Maplin Magazine to your door as soon as they're published.

Order

XA00A (Maplin Mag Subscrptn) £3.00NV

Maplin Project Books and Magazines

Reprints of the constructional articles from previous issues of Electronics — The Maplin Magazine.

Maplin Projects Book One

Contains full construction details of a Combo-Amp, Universal Timer, Temperature Gauge, Pass The Bomb, Battery Monitor, Colour Snap Game, CMOS Logic Probe, Peak Level Indicator, Games Timer and Multicolour Pendant.

Order

XA01B (Projects Book One) 75pNV

Maplin Projects Book Two

Contains full construction details of a Home Security System, 14-Channel 2-wire Model Train Controller, Multi-Mode Stopwatch and Miles-Per-Gallon Meter.

Order

XA02C (Projects Book Two) 75pNV

Maplin Projects Book Three

Contains full construction details of our ZX81 Keyboard with Electronics, Stereo 25W MOSFET Amp, Radar Doppler Intruder Detector and Model Train Controller Remote Control Facilities.

Order

XA03D (Projects Book Three) 75pNV

Maplin Projects Book Four

Contains full construction details of a Car Burglar Alarm, 8-Digit Frequency Counter, ZX81 I/O Port, Remote Control for Amplifiers, Telephone Exchange and Ultrasonic Intruder Detector.

Order

XA04E (Projects Book Four) 75pNV

Maplin Projects Book Five

Contains full construction details of the Maplin Modem, Central Heating Controller, 240V Inverter, Timer for the External Horn on our Home Security System, Panic Button, Sounds Generator for the ZX81 and more Model Train Projects.

Order

XA05F (Projects Book Five) 75pNV

Maplin Projects Book Six

Contains full construction details of Speech Synthesisers (the Talkback) for ZX81 and VIC20, TV Sound and Normal/Inverse Video For ZX81, Scratch Filter, Bridging Module for MOSFET Amps, Moisture Meter, Portable Stereo Amplifier, Sinewave Generator, Headphone Enhancer, and Stylus Organ.

Order

XA06G (Projects Book Six) 75pNV

Maplin Project Book Seven

Contains full construction details of RS232 Interfaces for ZX81 and VIC20, Enlarger Timer/Controller, DXer's Audio Processor, CMOS Crystal Calibrator and Sweep Oscillator.

Order

XA07H (Projects Book Seven) 75pNV

Maplin Projects Book Eight

Contains full construction details of RS232 Interfaces for the Spectrum and Dragon Computers, I/O Ports for the Dragon, Synchime, Codelock, Logic Probe, Doorbell For The Deaf and Minilab Power Supply

Order

XA08J (Projects Book Eight) 75pNV

Maplin Magazine Issue Nine

Contains full constructional details of an improved, full size keyboard for the ZX Spectrum, a three port extendi-board for the VIC 20, a speech synthesiser for the Oric 1 with a large vocabulary, an Infra-Red Movement Detector for security of premises, offering protection by detecting an intruder up to 30 metres away outdoors; TDA 7000 Radio, a simple FM receiver using the TDA 7000 chip, High Resolution Graphics plug-in module for the ZX81, Dynamic Noise Limiter for Personal Stereo Cassette players, Logic Pulser, 1K Extendi-RAM for the ZX81, TTL/RS232 Converter, Pseudo-Stereo AM Radio.

Order

XA09K (Maplin Mag Vol 3 No 9) 70pNV

Maplin Projects Book Ten

Contains full construction details of Spectrum Easyload, simple single-sideband, direct conversion 80 Metre Receiver, Driver Module for 12V 8W Fluorescent Tubes, a 2.8KW Power Controller, Auto-Waa effects unit, Digi-Tel expansion for the Maplin Digi-Tel telephone exchange, Oric 1 Modem Interface, and the Dragon Extendiport.

Order

XA10L (Projects Book Ten) 75pNV

Maplin Projects Book Eleven

Contains full constructional details of the Mapmix six channel mixer, compact Xenon flash tube Driver Module with internal strobe, Enlarger Exposure Meter, Eight Channel Fluid Detector, Model Servo and Driver Module, Mark II Noise Reduction Unit, Cautious Ni-Cad Charger, and a Motherboard for the BBC Micro.

Order

XA11M (Projects Book Eleven) 75pNV

Maplin Projects Book Twelve

Contains full constructional details of the TU1000 RTTY Unit, Computadrum, a Light Pen for micro's, Navigation System using ZX81 (part 1), Pulse Width Modulation Proportional Model Motor Driver Module.

Order

XA12N (Projects Book Twelve) 75pNV



Maplin Magazine Issue 13

Contains full constructional details of Explosive Gas Alarm, Flash Meter, Musical Announcer, Mains Controller for 8-Channel Fluid Detector, and part 2 of the Navigation System using ZX81.

Order

XA13P (Maplin Mg Vol 4 No 13) 75pNV

Maplin Magazine Issue 14

Contains full constructional details of Live Wire Detector, Trundle the Channel 4 Robot, 4-Channel PWM Controller, Display Driver Module, and Control-A-Train inertia model train controller.

Order

XA14Q (Maplin Mg Vol 4 No 14) 75pNV

Maplin Magazine Issue 15

Contains full constructional details of a Z80 CPU Module, Ultrasonic Car Alarm, Active Crossover and matched 3-Channel Amplifier, Guitar Equaliser, and Serial Interface for the Sharp MZ80K.

Order

XA15R (Maplin Mg Vol 4 No 15) 75pNV

Maplin Magazine Issue 16

Contains full constructional details of a Data Communications System using the mains wiring, a Parallel/Serial Port for the Sinclair Spectrum, a 16-Channel Logic IC Tester interface for oscilloscopes, a Floodlight Controller for burglar alarms, and the mechanical details of an IBM Golfball Printer project (part 1).

Order

XA16S (Maplin Mg Vol 4 No 16) 75pNV

PROTECTION

Burglar Alarm Accessories 274
Fuses 273

Panic Horn 275
Suppressors 274

Thermal Fuses 274
Vibration Sensor 275

FUSE HOLDERS

20mm Type



A panel mounting 20mm fuseholder with screwdriver release to meet the latest safety regulations. 6.3A max.

Overall length: 32mm. Bezel dia. 15mm. Panel cut-out 12.7mm.

Order

RX96E (Safuseholder 20) 60p

6A 1 1/4in Type



A panel mounting 1 1/4in fuseholder with a flush fitting, square red coloured cap bearing the legend 'FUSE' in black. Fuse cartridge is simply inserted into the cap which pushes into the body, but the latch must align with slot in bevel. Only a small narrow screwdriver or similar tool can be pushed down into the slot to release the latch in order to gain access to the fuse. Restrain the cap to prevent it flying out of the body. Complies with BS standards. Max rating 6A @ 250V AC.

Length: 50mm. Bezel 16mm x 16mm square. Panel cut-out 15mm (5/8in.)

Order

FA39N (1.1/4 Clickcatch F/H) 60p

16A 1 1/4in Type



A panel mounting 1 1/4in fuseholder with screwdriver release to meet the latest safety regulations. 16A max. Overall length: 59mm. Bezel dia. 18mm. Panel cut-out: 115mm.

Order

RX97F (Safuseholder 1.1/4in) £1.98

Fuseholder Insulating Boot

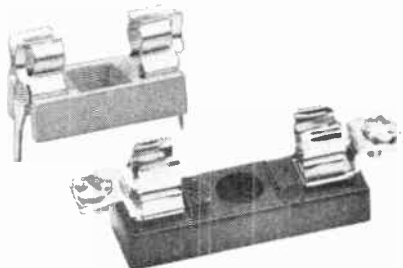


A pliable PVC insulating boot for enclosing and covering cables connected to the terminals at the rear of any of our panel mounting cartridge fuseholders.

Order

FT35Q (Fuseholder Boot) 28p

Chassis Types



Chassis mounting moulded fuse holders with tinned phosphor-bronze clip. Single 6BA clear fixing hole. Size: For 20mm fuses — 22mm long, 16mm high, 8mm wide. For 1 1/4in fuses — 41mm long, 16mm high, 12mm wide.

Order

RX49D (Chassis F/H 20mm) 14p
RX50E (Chassis F/H 1.1/4 in) 28p

Fuse Clips

Tinned brass fuse clips for 20mm fuses. The lugs on the clip are on a 2.54 x 2.54mm (0.1in x 0.1in) matrix and will fit into 1.5mm dia. holes. Two clips are required per fuse.



Order

WH49D (Fuse Clip) 2p

In-Line Type



Bayonet-action in-line car type fuseholder with moulded body, suitable for 1 1/4in fuses. Length 52mm, diameter 14mm.

Order

RX51F (F/H Car) 15p

FUSES

20mm Quickblow Type



Quickblow glass cartridge fuses. Size: 20mm long x 5mm dia.

Available in the following ratings:

50mA, 100mA, 160mA, 250mA, 315mA, 500mA, 630mA, 800mA, 1A, 1.6A, 2A, 3A, 5A.

Order

WR93R (Fuse 20mm 50mA) 6p
WR00A (Fuse 20mm 100mA) 6p
WR94C (Fuse 20mm 160mA) 6p
WR01B (Fuse 20mm 250mA) 6p
RA01B (Fuse 20mm 315mA) 6p
WR02C (Fuse 20mm 500mA) 6p
RA02C (Fuse 20mm 630mA) 6p
RA03D (Fuse 20mm 800mA) 6p
WR03D (Fuse 20mm 1A) 6p
WR04E (Fuse 20mm 1.6A) 6p
WR05F (Fuse 20mm 2A) 6p
WR06G (Fuse 20mm 3A) 6p
WR07H (Fuse 20mm 5A) 6p

20mm Anti-Surge Type



Anti-surge glass cartridge fuses, will withstand surges of up to ten times the rated current for 20 milliseconds.

Size: 20mm long x 5mm dia.

Available in the following ratings.

80mA, 160mA, 250mA, 315mA, 500mA, 630mA, 800mA, 1A, 1.6A, 2A, 3.15A, 5A, 6.3A.

Order

RA04E (Fuse A/S 80mA) 18p
RA05F (Fuse A/S 160mA) 15p
RA06G (Fuse A/S 250mA) 12p
RA07H (Fuse A/S 315mA) 12p
WR18U (Fuse A/S 500mA) 12p
RA08J (Fuse A/S 630mA) 12p
RA09K (Fuse A/S 800mA) 12p
WR19V (Fuse A/S 1A) 12p
RA10L (Fuse A/S 1.6A) 12p
WR20W (Fuse A/S 2A) 12p
RA11M (Fuse A/S 3.15A) 12p
RA12N (Fuse A/S 5A) 12p
RA13P (Fuse A/S 6.3A) 12p

1 1/4in Quickblow Type



Quickblow glass cartridge fuses. Size: 1 1/4in (32mm) long x 1/4in (6.4mm) dia.

Available in the following ratings.

50mA, 100mA, 150mA, 250mA, 500mA, 1A, 1.5A, 2A, 3A, 5A, 10A, 15A

Order

WR95D (Fuse 1.1/4 50mA) 8p
WR08J (Fuse 1.1/4 100mA) 8p
WR96E (Fuse 1.1/4 150mA) 8p
WR09K (Fuse 1.1/4 250mA) 8p
WR10L (Fuse 1.1/4 500mA) 8p
WR11M (Fuse 1.1/4 1A) 8p
WR12N (Fuse 1.1/4 1.5A) 8p
WR13P (Fuse 1.1/4 2A) 8p
WR14Q (Fuse 1.1/4 3A) 8p
WR15R (Fuse 1.1/4 5A) 8p
WR16S (Fuse 1.1/4 10A) 8p
WR17T (Fuse 1.1/4 15A) 8p

1in Type Domestic Mains Fuses



Standard electrical plug fuses to BS1362. Size 1in (25.4mm) long x 1/4in (6.4mm) dia.

Available in the following ratings.

2A, 3A, 5A, 13A.

Order

HQ31J (Plug Fuse 2A) 10p
HQ32K (Plug Fuse 3A) 10p
HQ33L (Plug Fuse 5A) 10p
HQ34M (Plug Fuse 13A) 10p

Thermal Fuses

NEW

A range of thermal fuses which will protect any equipment or appliance from excessive temperature rise by cutting off the supply, since they are connected into a circuit in the same way as an 'ordinary' fuse would be. These thermal fuses offer a low impedance when operational, but will go open circuit if their temperature range threshold is exceeded. They will serve to protect equipment from heat damage if the source of excess heat originates within the equipment itself as the result of a fault, cutting off the power where the ordinary fuse fails to do so because the current load is not great enough, yet there is enough power being converted to heat to start a fire.

These devices are extensively applied in industry in the manufacture of sandwich toasters, water heaters, hair curlers etc. They are not resettable and must be replaced if 'blown'.

NOTE: when installing any of these devices *never* solder directly to the wire leads - you must use screw terminals, terminal blocks or crimped on connectors.

Size of body: 14mm long x 4mm dia.

Lead length (each end): 34mm.

Rating: 240V @ 15A max.

Rupture current: 40A (resistive), 20A (inductive).

Open circuit breakdown voltage: 1200V AC

Opening threshold temperature tolerance: +0°C -4°C.

General Purpose Range

A range of thermal fuses covering a wide range of operating temperatures, available as follows:
91°C, 128°C, 141°C, 152°C, 169°C, 184°C, 194°C, 216°C, 228°C, 240°C

Order

RA14Q (Thermal Fuse 91C)	48p
RA15R (Thermal Fuse 128C)	48p
RA16S (Thermal Fuse 141C)	48p
RA17T (Thermal Fuse 152C)	48p
RA18U (Thermal Fuse 169C)	48p
RA19V (Thermal Fuse 184C)	48p
RA20W (Thermal Fuse 194C)	48p
RA21X (Thermal Fuse 216C)	48p
RA22Y (Thermal Fuse 228C)	48p
RA23A (Thermal Fuse 240C)	48p

Audio Range

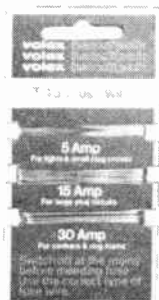
A range of thermal fuses formulated especially for applications in audio equipment, test instruments etc. Temperature ratings available are:

72°C, 84°C, 100°C, 109°C, 121°C

Order

RA61R (Thermal Fuse 72C)	48p
RA62S (Thermal Fuse 84C)	48p
RA63T (Thermal Fuse 100C)	48p
RA64U (Thermal Fuse 109C)	48p
RA65V (Thermal Fuse 121C)	48p

Fuse Wire



A card on which is wound three pieces of fuse wire. 5A, 15A and 30A.

Order

HB51F (Fuse Wire)	30p
-------------------	-----

SUPPRESSORS RF Suppressor Chokes

Designed for use at 250V AC these small heavy current rf chokes are ideal for the suppression of motor-driven appliances and in input circuits of power units. Inductance is approximately 6μH. PVC sleeve is colour coded. Three types are available.

Rating	Length	Diameter	Colour code
1 Amp	15mm	5.1mm	White
2 Amp	19mm	5.1mm	Yellow
3 Amp	23mm	7.6mm	Black

Order

HW04E (RF Supp Choke 1A)	32p
HW05F (RF Supp Choke 2A)	35p
HW06G (RF Supp Choke 3A)	38p

Contact Suppressor



A 100Ω resistor (±5% tolerance) and 0.1μF (±10% tolerance) capacitor connected in series. Connect directly across switch or relay contacts etc. to suppress interference when switching reactive loads. Also useful as a snubber network in SCR and triac protection. Max voltage 250V AC.

Order

YR90X (R-C Network)	£1.80
---------------------	-------

Mains Transient Suppressor

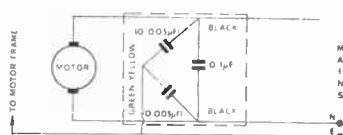


Simply connect this device across the mains. It has a very high resistance at 240V rms and therefore usually may be ignored, but the moment a spike appears on the supply line which exceeds the peak level of mains voltage, the impedance of the device drops immediately to a very low level while it dissipates the unwanted energy.

Order

HW13P (Mains Trans Supp)	48p
--------------------------	-----

Motor Suppressor



For radio suppression of small electric motors and domestic appliances. 250V AC. Connect as close as possible to the source of interference. 0.1μF + 0.005μF + 0.005μF.

Order

HW07H (Delta Cap)	98p
-------------------	-----

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BURGLAR ALARM ACCESSORIES

Reed Switch Recessed



A reed switch and magnet encapsulated in identical white plastic mouldings designed to be recessed into door or window frames. Reed moulding has four wires, two form a security loop, the other two are connected to the reed. Reed contact makes when subjected to a magnetic field.

Operate resistance:	14mm
Release distance:	15.5mm
Flange dimensions:	12mm dia x 3/4mm thick
Main body dimensions:	27.5 x 8mm dia.

Order

YW46A (Door Contact Reed)	£1.95
---------------------------	-------

Five Terminal Flush Contact Reed Switch



A magnet and reed switching sensor for burglar alarms, normally to be recessed into doors or windows and their frames. One part contains the magnet, while the other part contains the reed switch which is normally closed in the presence of the magnet. Opening the door/window will cause the reed to open. The reed switch terminates in a pair of screw terminals, and there are a further three terminals for the security loop. Operating distance, reed to magnet: Reed closes at 17mm, and opens at 23mm. Dimensions, magnet or reed: Length 35mm, width 22mm. Requires a recess at rear in door or frame 19mm diameter (3/4in), by 15mm deep. Fixing centres 27mm.

Order

FK77J (Flush Contact Reed)	£1.75
----------------------------	-------

Reed Switch Surface



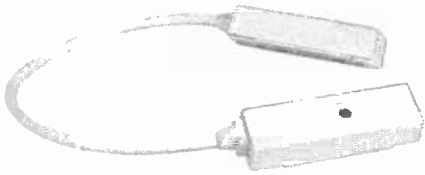
A surface mounting reed switch and magnet in similar white plastic mouldings. Reed unit has four wires, two for making security loops and two (with ends stripped) are connected to the reed. Suitable fixings (not supplied), four 1in. countersunk No. 6 woodscrews. Reed contact makes when subjected to a magnetic field.

Operate distance:	12mm
Release distance:	15.5mm
Dimensions:	65 x 13 x 13.5 (reed unit) 65 x 13 x 10mm (magnet)
Fixing centres:	56.5mm

Order

YW47B (Surface BA Reed)	£1.95
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Door Loop

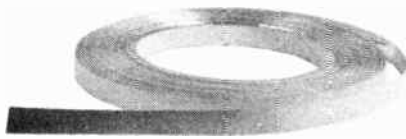


Two junction boxes connected together with 300mm of four-core cable. Each box contains five screw terminals and two others, connected to a contact which makes when the lid is removed. Junction boxes and cable are white. Suitable fixings (not supplied), four 1/2in. countersunk No. 6 woodscrews. Dimensions of each box: 80 x 24 x 18mm. Fixing centres: 56.5mm.

Order

YW48C (Door Loop) £1.95

Window Foil

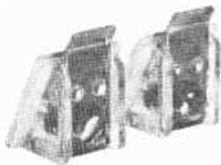


A self-adhesive aluminium foil with a strong adhesive on one side and a shiny finish on the other. Stick about 1in. from the frame all round the glass. If the glass cracks the foil will break. Supplied on reel 33m x 9mm.

Order

YW50E (Window Foil) £1.45

Window Foil Terminations

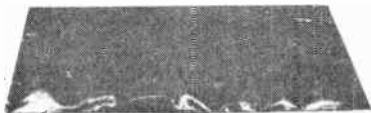


Two self-adhesive terminating blocks which clamp onto the ends of the window foil and provide a screw terminal connection to the foil. Moulded in clear acrylic plastic.

Order

YW51F (Foil Terms) 60p

Pressure Mat



Designed for use with intruder alarms etc., the mat is placed under a carpet, rug etc. and gives an abrupt change from open to short circuit when stepped on. Size: 750 x 420 x 2mm.

Order

YB91Y (Pressure Mat) £3.55

Stair Pressure Mat



A four contact pressure mat as above, but having dimensions 750mm x 150mm in order to lay along the top of a step or stair.

Order

FK79L (Stair Press Mat) £2.25

Junction Box 5-Way

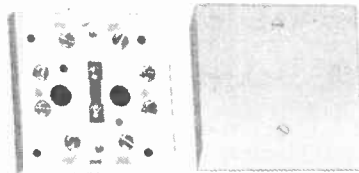


A white PVC junction box with five screw terminals and two others connected to a contact which makes when the lid is on and breaks when the lid is removed. Suitable fixings (not supplied), two 1/2in. countersunk No.6 woodscrews. Dimensions: 80 x 24 x 18mm. Fixing centres: 56.5mm

Order

YW49D (BA Junction Box) 58p

Junction Box 8-Way



A junction box for interconnecting cables of a security system. The box has a pair of contacts at centre which are normally closed with the lid in position, but which are released if any attempt is made to remove the lid. There are eight additional screw terminals, and a number of holes are provided in the back for cable entry and screw fixing. Dimensions: 65mm square x 18mm deep.

Order

FK76H (Junc Box JB8S) 95p

Panic Button

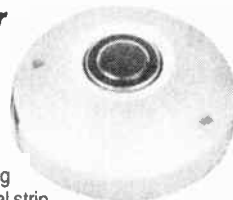


A red button in a round, off-white mounting for fixing to a wall, under-side of a table or counter or any flat surface, which may be used to trigger an alarm system manually. Contacts are single pole push to make, with screw terminals. The red button is surrounded by a shallow, concave recess to prevent it being depressed accidentally. Dimensions: - 44mm diameter x 18mm deep. Fixing centres 28mm, two screws supplied.

Order

FK46A (Panic Button) £1.45

Heat Detector

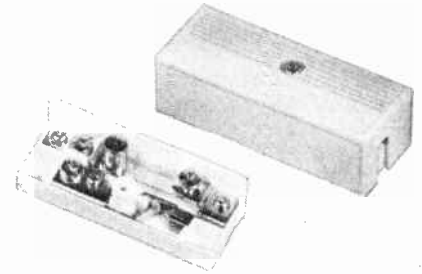


A heat sensor comprising an encapsulated bi-metal strip acting as a normally open single pole make switch. The round metal sensor is mounted in a white, bevelled patress, although this may be dispensed with if space is at a premium since the sensor is easily removable. It is secured in its mounting by the two contact tags and two screws. The bi-metal strip operates at 60°C ±5°C. Contacts are rated at 0.3A at 24VDC. Dimensions: 49mm diameter x 20mm deep. Sensor unit is 16mm diameter. Has two pairs of screw terminals.

Order

FK47B (Heat Detector) £4.95

Vibration Sensor



A simple mechanical vibration sensor comprising a weighted moving contact which can be adjusted by a set-screw for varying degrees of sensitivity. Usually the screw setting is chosen for the contacts to be normally closed; physical displacement of the unit causing the contacts to open since the weighted movable portion remains inert relative to the body of the unit. The detector reacts best to a displacement in the same direction as the moving contact's natural direction of movement (it will operate with a displacement applied at right-angles, but to a lesser degree). Greatest sensitivity can be achieved by mounting the unit vertically with the bob-weight of the movable contact uppermost (cable entry hole at top). To ensure equal sensitivity in both directions two such units may be used mounted vertically with one turned 90° to the other. The two units are then wired together in series. In addition, a second contact is provided in series with the movable contact which is normally held closed by the cover so that the cover cannot be removed without triggering the alarm. Readily applicable to automotive security systems, for example.

Dimensions: 66.5mm long x 21mm wide x 18mm deep.

Order

FK78K (Vibration Detector) £1.95

PANIC HORN



A portable audible warning device, used as a crime prevention aid. The Panic Horn produces a loud, piercing noise to deter any would-be attacker, and summon help in an emergency situation. The horn is sounded by pressing the large, red bar, and can only be stopped by dialling in its personal code number with the two numbered knobs. This code is set at the factory and there are 36 different combinations. The unit has a wrist-strap for easy carrying, and by which it can be hung from the door handle of a hotel room, for example, for use as an intruder alarm. In this case a leaf spring switch, provided, can be inserted between the door and door frame, and connects to the Panic Horn via a jack plug and a 900mm long lead. The leaf spring switch will drop out if the door is opened and set off the alarm. Supplied with full instructions for use.

Dimensions: 117mm long x 65mm x 58mm.

Weight: 160g.

Requires one PP3 size battery which must be an alkaline type, e.g. Gold Seal FK67X.

Order

FK75S (Panic Horn) £12.95

RECORD, TAPE AND VIDEO

Cartridges 277
Cassette Care Products 282
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Cassette Tapes 284
Music Centre Guide 280
Record Care Products 281

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SPARE PARTS FOR RECORD DECKS

12V Disco Record Deck

NEW

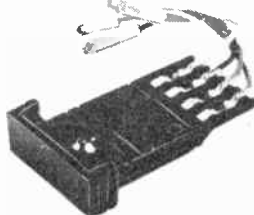


A good quality record deck for general purpose usage and suitable for use in mobile discos etc. Finished in matt black, it features a counter-balanced tone arm supported in gimbal bearings, having anti-skate adjustment, and an arm lift or cue lever. An unusual feature of this deck is that it uses an electronically controlled drive motor which operates from 12V DC. Two controls are provided to select either 33 or 45 RPM, and provide for a degree of fine speed adjustment. The turntable motor is started and stopped by simply lifting the tone arm away from, and returning it to the arm rest. The integral headshell is wired for stereo, but no cartridge or carrier is supplied. Connections are brought out to a five way tag strip, which includes chassis earth. The motor and control circuit require a DC power supply of 9 to 15V DC at 40mA (12V DC typical) – motor stall current (turntable stopped) is 225mA. The complete unit measures 330mm x 285mm at base, and requires a clearance of 50mm below this (depth of plinth). Weight, 1.7kg.

Order

XG68Y (12V Disco Deck) £39.95

BSR Cartridge Slide



Fitted with four leads, red, green, black and white. This slide is suitable for use as a replacement or as a quick and easy way to use alternative cartridges. Fit one cartridge to each slide; then to change cartridges simply slide out one and slide in the other. Slide type MP60 for use with MP60, HT70, 510, 610, P128, P144 and BDS80. Dimensions: 22mm front width, 18mm carrier width, 35mm depth.

Order

FQ17T (Cartridge Slide MP60) £1.95

BSR Drive Wheel



A rubber drive wheel or jockey pulley with metal centre. Suits most models except 710 and 810.

Order

LB75S (Drive Wheel BSR) £2.20

BSR Drive Belt

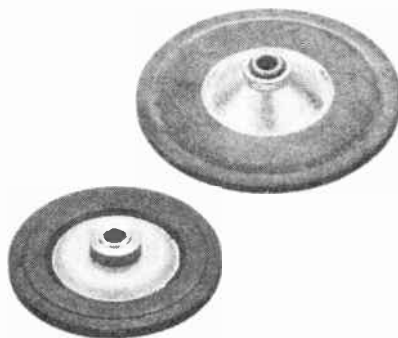


A replacement drive belt to suit models BDS95 and P163. BSR part number A110684.

Order

YW58N (BSR Drive Belt) £2.40

Garrard Drive Wheels



Rubber drive wheels (interwheels) with metal centre. Two types available. Large type suits SP25 series, AT series, SL series, 2025 series, AP76, 1000, 1025 and others. Small type suits 6100C, 6200C, 6200CP, 6300 and 6400.

Order

LB76H (Dr Wheel Garrard Lrg) £2.75
FQ30H (Dr Wheel Garrard Sm) £2.75

Garrard Drive Belt

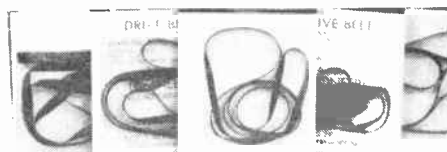


A replacement drive belt to suit models SP25V, 86SBI, 86SB11, 125SB, GT10, GT20, GT35, GT55, 35SB. Garrard part number 79633.

Order

FQ36P (Garrard Drive Belt) £2.95

Drive Belts For Japanese Turntables



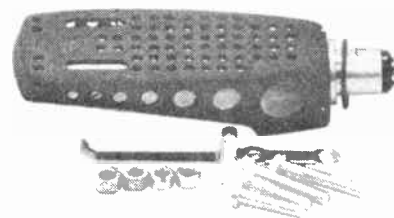
A range of Record Turntable Drive Belts for the most popular Japanese record decks. All types have a flat cross-section and are 0.6mm thick.

	National Panasonic	Pioneer	Sony/ Nat Pan
Diameter:	187	189	195
Width:	4	5	5
Inside Circumference:	588	594	613
	Trio/ Sharp	Sansui	Hitachi
Diameter:	201	205	210
Width:	6	6	4
Inside Circumference:	632	644	660

Order

FJ18U (Dr/Belt N/Pan AS8187) £2.95
FJ19V (Dr/Belt Pionr AS8189) £2.95
FJ20W (Dr/Belt Sony AS8195) £2.95
FJ21X (Dr/Belt Trio AS8201) £2.95
FJ22Y (Dr/Belt Snsui AS8205) £2.95
FJ23A (Dr/Belt Htchi AS8210) £2.95

UNIVERSAL HEADSHELL



A very attractive matt black alloy headshell that fits most tonearms on sale in the U.K. Supplied with hardware. Minimum mass 7.2 grams.

Order

XX34M (Headshell) £2.95

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CARTRIDGES

Mono Crystal BSR X5M



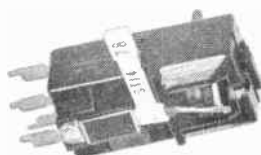
A crystal mono cartridge which is suitable for playing stereo records. Supplied with carrier for centre hole fixing or standard 1/2in. fixing. Overall size: 28 x 15 x 11mm (excl tabs and lugs). Fitted with a diamond stylus.

Output at 1cm/sec: 400mV
Tracking Weight: 3 to 6gm
Frequency Response: 40Hz to 10kHz
Recommended Load: 2M Ω and 100pF
Stylus Fitted: ST15 LP/LP Changeover
Replacement stylus: ST15

Order

HR01B (Ctrdg BSR X5M) £3.95

Stereo Crystal BSR SX6M and SX6H



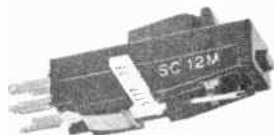
A crystal stereo cartridge supplied with carrier for centre hole fixing or standard 1/2in fixing. Overall size: 28 x 15 x 11mm (excl. tabs and lugs). Fitted with a diamond stylus.

Output at 1cm/sec: 280mV (6M), 700mV (6H)
Tracking weight: 4 to 6gm (6M), 5 to 7gm (6H)
Frequency response: 40Hz to 10kHz
Recommended load: 2M Ω and 100pF
Stylus fitted: ST15 LP/LP changeover
Replacement stylus: ST15

Order

HR04E (Ctrdg BSR SX6M) £4.45
HR05F (Ctrdg BSR SX6H) £5.45

Stereo Ceramic BSR SC12M and SC12H



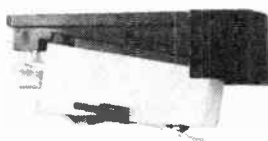
A ceramic stereo cartridge supplied with carrier for centre hole fixing or standard 1/2in fixing. Overall size: 28 x 9 x 8mm (excl tabs and lugs) Fitted with a diamond stylus.

Output at 1cm/sec: 100mV (12M), 170mV (12H)
Tracking weight: 2 to 6g (12M), 4 to 6g (12H)
Stylus fitted: ST17 LP/LP changeover
Replacement stylus: ST17

Order

HR09K (Ctrdg BSR SC12M) £4.75
HR10L (Ctrdg BSR SC12H) £4.75

Rigonda 2SB



A replacement cartridge for Rigonda, Symphonia, Marksman and Bolshoi audio equipment. Sapphire stylus.

Order

FY75S (Ctrdg Rigonda 2SB) £6.95

Sonotone 3509/3549



A stereo ceramic cartridge supplied with brackets for either centre hole or standard 1/2in fixing. Overall size: 27 x 11 x 10mm (excluding tabs and lugs) Fitted with a diamond stylus.

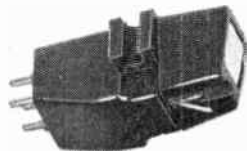
Output at 1cm/sec: 140mV (09), 100mV (49)
Tracking weight: 5 to 7g (09), 3 to 6g (49)
Recommended load: 1 to 2M Ω and 100pF
Stylus fitted: KS40A LP/LP changeover

Order

HR12N (Ctrdg Sono 3509) £5.95
HR13P (Ctrdg Sono 3549) £6.95

MAGNETIC CARTRIDGES

Sonotone V100



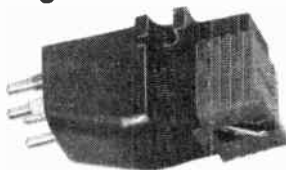
A stereo magnetic cartridge. Standard 1/2in fixing only. Overall size: 28 x 11.5 x 13mm (excl tabs and lugs) Fitted with a diamond stylus.

Output at 5cm/sec: 7mV rms
Tracking weight: 2 to 2 1/2gm
Frequency response: 20Hz to 20kHz
Stereo separation: >20dB at 1kHz
Recommended load: 47k Ω
Channel balance: <2dB at 1kHz
Stylus: 0.0006in diamond
Replacement stylus: V100

Order

HR17T (Ctrdg Sono V100) £6.95

Goldring G850



A stereo magnetic cartridge. Standard 1/2in fixing only.

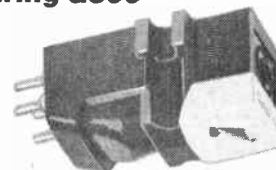
Overall size: 29 x 12 x 15mm (excl tabs and lugs). Fitted with a diamond stylus.

Output at 5cm/sec: 8mV rms
Tracking weight: 2 1/2 to 4gm
Frequency range: 20Hz to 18kHz
Stereo separation: 20dB at 1kHz
Recommended load: 47k Ω to 100k Ω
Cartridge weight: 7gm
Stylus: 0.0007in diamond
Replacement stylus: D120SR

Order

HR15R (Ctrdg Goldring G850) £9.95

Goldring G800



A stereo magnetic cartridge. Standard 1/2in fixing only.

Overall size: 28 x 13.5 x 15mm (excl tabs and lugs) Fitted with a diamond stylus.

Output at 5cm/sec: 5mV rms
Tracking weight: 1 1/2 to 2 1/2gm
Frequency range: 20Hz to 20kHz
Stereo separation: 20dB at 1kHz
Recommended load: 47k Ω to 100k Ω
Channel balance: 2dB
Compliance (static): 20 x 10⁻⁶ cm/dyne
Tip mass: 1 mgm
Cartridge weight: 7.5gm
Stylus: 0.0005in diamond
Replacement stylus: D110SR

Order

HR16S (Ctrdg Goldring G800) £11.95

Goldring G800H



A stereo magnetic cartridge. Standard 1/2in fixing only. The heavier tracking version of the G800, ideal for playing 45's owing to its slightly larger stylus tip.

Overall size: 28 x 13.5 x 15mm (excl tabs and lugs) Fitted with a diamond stylus

Output at 5cm/sec: 8mV
Tracking weight: 2 1/2 to 3 1/2gm
Frequency range: 20Hz to 20kHz
Stereo separation: 20dB at 1kHz
Recommended load: 47k Ω to 100k Ω
Channel balance: 2dB
Compliance (static): 18 x 10⁻⁶ cm/dyne
Tip mass: 1.2mgm
Cartridge weight: 8gm
Stylus: 0.0007 in diamond.

Order

FQ38R (Ctrdg Goldring G800H) £11.95

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282 London Rd., Westcliff. ☎0702 554000

Goldring G800E



A high quality stereo magnetic cartridge with an elliptical stylus. Standard 1/2in fixing only.

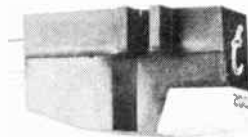
Overall size: 28 x 13.5 x 15mm (excl tabs and lugs)
Fitted with a diamond stylus

Output at 5cm/sec: 5mV
Tracking weight: 1 to 2gm
Frequency range: 10Hz to 25kHz
Stereo separation: 25dB at 1kHz
Recommended load: 47kΩ to 100kΩ
Channel balance: 2dB
Compliance (static): 20 x 10⁻⁶ cm/dyne
Tip mass: <1mgm
Cartridge weight: 8gm
Stylus: Elliptical 0.0008in x 0.0003in diamond
Replacement stylus: D110E

Order

FQ39N (Ctrdg Goldring G800E) £16.95

Tenorel T2001D



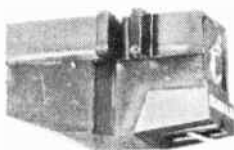
A stereo magnetic cartridge. Standard 1/2in fixing only.

Output at 5cm/sec: 5.5mV
Tracking weight: 1.5 to 3gm
Frequency range: 15Hz to 25kHz
Stereo separation: 25dB at 1kHz
Recommended load: 47kΩ
Channel balance: 2dB at 1kHz
Compliance (static): 20 x 1⁻⁶ cm/dyne
Tip mass: 1 mgm
Cartridge weight: 7 gm
Stylus: 0.0006in diamond
Replacement stylus: N2001D

Order

FQ40T (Ctrdg Tenorel T2001D) £5.95

Tenorel T2001ED



A high quality stereo magnetic cartridge with a nude elliptical stylus. Standard 1/2in. fixing only.

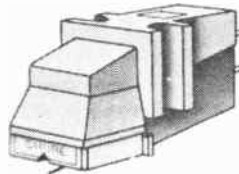
Output at 5cm/sec: 5.5mV
Tracking weight: 1 to 2.5gm
Frequency range: 15Hz to 32kHz
Stereo separation: 25dB at 1kHz
Recommended load: 47kΩ
Channel balance: 1.2dB at 1kHz
Compliance (static): 25 x 10⁻⁶ cm/dyne
Tip mass: 0.75mgm
Cartridge weight: 7 gms
Stylus: Elliptical 0.0007in x 0.0002in diamond
Replacement stylus: N2001ED

Order

FQ41U (Cdg Tenorel T2001ED) £8.95

Shure Encore ME70-B

NEW



A stereo magnetic cartridge. 1/2in fixing only.

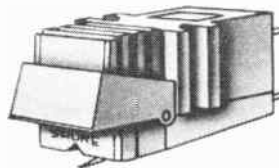
Output, 1kHz at 5cm/sec: 6mV
Tracking force: 1 1/2 to 3gm
Frequency response: 20Hz to 20kHz
Stereo separation: 20dB
Channel balance: <2dB
Stylus: 0.0006in spherical diamond
Replacement stylus: N70B

Order

FV16S (ME70-B Shure Cart) £11.50

Shure Encore ME75-6S

NEW



A stereo magnetic cartridge. 1/2in fixing only.

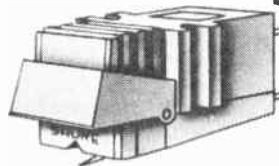
Output, 1kHz at 5cm/sec: 6mV
Tracking force: 1 1/2 to 3gm
Frequency response: 20Hz to 20kHz
Stereo separation: 20dB at 1kHz
Channel balance: <2dB
Stylus: 0.0006in conicle diamond
Replacement stylus: N75-6

Order

FV13P (ME75-6S Shure Cart) £13.75

Shure Encore ME75-EJ Type 2

NEW



A stereo magnetic cartridge. 1/2in fixing only. This cartridge has a biradial elliptical stylus with high trackability characteristics, and a hinged stylus guard.

Output, 1kHz at 5cm/sec: 6mV
Tracking force: 1 1/2 to 3gm
Frequency response: 20Hz to 20kHz
Stereo separation: 20dB
Channel balance: <2dB
Stylus: 0.0004 x 0.0007 elliptical diamond
Replacement stylus: N75EJ T2

Order

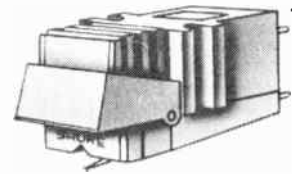
FV15R (ME75-EJ 2 Shure Cart) £17.95

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Shure Encore ME75-ED Type 2

NEW



A stereo magnetic pick-up cartridge. 1/2in fixing only. This cartridge features an ultra light stylus tip mass to provide for excellent tracking characteristics. Includes hinged stylus guard.

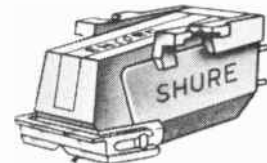
Output 1kHz at 5cm/sec: 6mV
Tracking force: 3/4 to 1 1/2gm
Frequency response: 20Hz to 20kHz
Stereo separation: 25dB at 1kHz
Channel balance: <2dB at 1kHz
Stylus: 0.0002 x 0.0007in elliptical diamond
Replacement stylus: N75ED T2

Order

FV14Q (ME75-ED 2 Shure Cart) £22.95

Shure Encore ME95-ED

NEW



A high quality stereo magnetic cartridge which introduced was second only to the Shure V15 Mk III. Its high trackability performance and flat frequency response is aided by a low-loss/high output magnetic pole-piece, and a low mass biradial elliptical stylus. 1/2in fixing only.

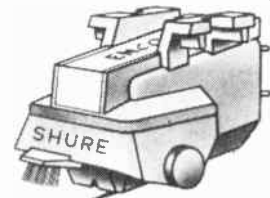
Output 1kHz at 5cm/sec: 4.7mV
Tracking force: 3/4 to 1 1/2gm
Frequency response: 20Hz to 20kHz
Stereo separation: 25dB
Channel balance: <2dB
Stylus: 0.0002 x 0.0007in elliptical diamond
Replacement stylus: NE95ED

Order

FV18U (ME95-ED Shure Cart) £26.50

Shure Encore ME97-HE

NEW



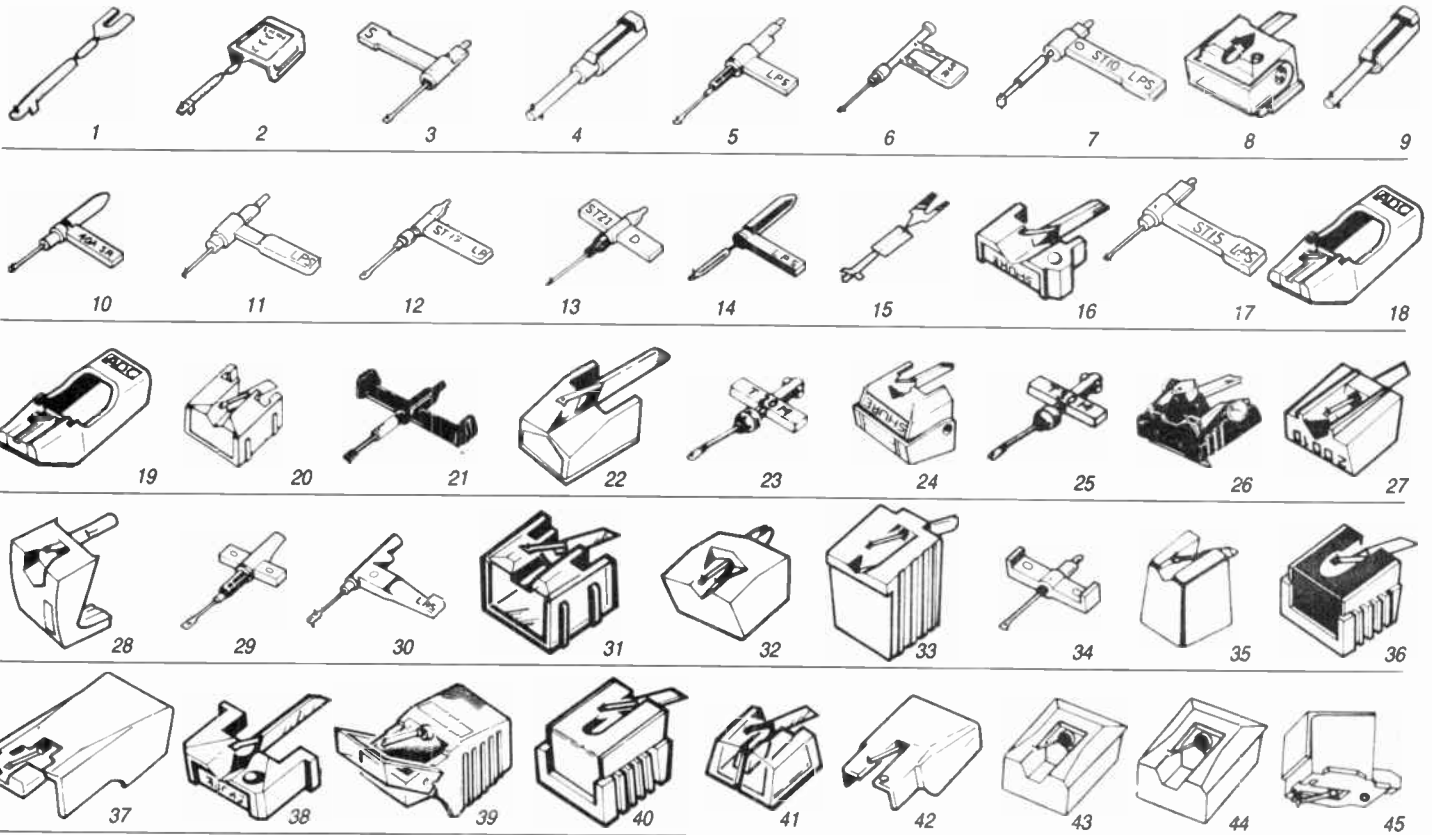
Top of the Encore range is this high quality stereo magnetic cartridge. Features include trackability enhancing dynamic stabilizer; built in brush which neutralises static electricity and sweeps away minute dust particles from the record surface; low-mass stylus shank for improved trackability, stylus side guards and hyper-elliptical stylus tip. 1/2in fixing only.

Output 1kHz at 5cm/sec: 4mV
Tracking force: 3/4 to 1 1/2gm
Frequency response: 20Hz to 20kHz
Stereo separation: 25dB
Channel balance: <2dB
Stylus: 0.0002 x 0.00015in hyper-elliptical diamond
Replacement stylus: NE95HE

Order

FV17T (ME97-HE Shure Cart) £42.50

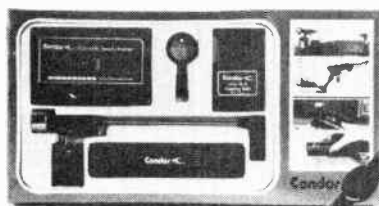
STYLI



Model	Stock Code	Diagram Number	Model	Stock Code	Diagram Number	Model	Stock Code	Diagram Number	Model	Stock Code	Diagram Number	Model	Stock Code	Diagram Number
Acos			Electro Voice			V201	HR81C	15	Ronette			3509	HR53H	10
GP83-2	HR39N	1	3005D	HR51F	2				BF40	HR51F	2	9TAHC	HR60Q	6
GP91-1	FV26D	9	3006	HR51F	2	Mitsubishi			DC208/284/395	HR51F	2	Sony		
GP91-1SC	HR25C	4	3008	HR51F	2	3D/20	HR81C	15	ST105/106	HR51F	2	D235	HR81C	15
GP92-1	FV26D	9	Fuji			3D/33M	HR97F	31				ND15P	YX27E	8
GP93-1	FV26D	9	SP16	HR81C	15	Garrard			Sansui			ND129	BK12N	42
GP94-1	FV26D	9	ST15	HR81C	15	D3	FM70M	30	SN28	HR95D	36	ND138G	BK07H	44
GP95-1	FV26D	9	National Panasonic			GCM31	FQ45Y	14	ST1D	HR81C	15	ND150P	HR49D	33
GP96-1	FV26D	9	EPS04	HR81C	15	GCS35/36	FQ45Y	14	Sanyo			Stanton		
GP101	HR39N	1	EPS31	BK12N	42	GDD1	FQ45Y	14	ST35D	FV21X	43	D5107AL	BK19V	28
GP104	HR31J	11	EPS34	BK12N	42	GDS1	FQ45Y	14	ST41J	FV21X	43	Tenorel		
ADC			EPS36	FV29G	34	GKS25	FM70M	30	ST55D	BK07H	44	2001D	FQ51F	27
RSQ30 Mk III	YX06G	18	EPS270	FV23A	41	GSS1	FQ45Y	14	ST107	FV24B	20	2001ED	FQ52G	27
RSQ33	FV25C	19	EPS75	FV21X	43	KS40A	HR53H	10	STG3	HR81C	15	Tetrad		
Aiwa			EPS77	FV21X	43	Goldring			STG6	FV22Y	21	T20MD	FM76H	23
AN5	BK07H	44	SPJ4	HR81C	15	D110E	HR76H	32	STL1	HR81C	15	T30M	FV20W	25
Akai			NEC			D110H	HR77J	32	2611K	HR97F	31	Toshiba		
RS100	HR79L	39	LP15S	HR81C	15	D11DSR	HR48C	32	2611 Super	FV24B	20	TP102/106/114	HR81C	15
Astatic			SP15S	HR81C	15	D12DSR	HR49D	33	Sharp			TPN2C	HR81C	15
160	FV27E	3	Onkyo			Hitachi			N01/02/04/11/21	HR81C	15	TPN6C	HR81C	15
N-320	HR51F	2	DN1	HR81C	15	DS	HR81C	15	N20D	BK12N	42	N14D	BK12N	42
N-601	HR51F	2	DN27	BK12N	42	DS-HT35	BK07H	44	RP1	HR81C	15	Trio		
Audio Technica			DN52	BK07H	44	HN-ST6	FM76H	23	STY104	FV28F	40	N32/33	BK12N	42
ATS10L	BK12N	42	SN2	HR81C	15	HN-ST7	HR99H	37	STY113	HR81C	15	Vaco		
ATN3400	BK07H	44	SN11	HR81C	15	SP1	HR81C	15	STY117	FV24B	20	Luxor	HR81C	15
ATN3401	FV21X	43	Perpetuum-Ebner			ST2	HR81C	15	STY118	FV21X	43	Ronette	HR81C	15
ATN3600	FG94C	45	PE20/30/35/90	HR51F	2	ST9	HR81C	15	STY123	FG94C	45	SN54	HR39N	1
BSR			Philips			ST13	HR79L	39	STY207	BK12N	42	ST20-1-40	HR39N	1
Monarch TC8	HR39N	1	AG-3306	HR87U	5	ST103	HR79L	39	STY717	HR99H	37	ST100	HR39N	1
ST34/5/6/7	FV27E	3	AG-3310	HR87U	5	ST110	HR61R	35	STY451	HR81C	15	Victor		
ST8-9/10	HR42V	7	AG-3224	HR87U	5	Jensen			T500	HR81C	15	DT7	HR81C	15
ST12/14/15	HR45Y	17	GP200	HR87U	5	CRA	HR51F	2	1013	HR81C	15	DT29	HR97F	31
ST16/17	HR47B	12	GP204/205	HR89W	29	JVC			Shure			Webster		
ST20/21	HR74R	13	GP224	HR87U	5	DT7	HR81C	15	N70-B	FV32K	38	MC-1	HR39N	1
Calrad			GP300/306/310	HR87U	5	DT31	BK12N	42	N75-ED			Zenith		
Calrad	HR81C	15	GP400	HR90X	22	SS2	HR81C	15	Type II	FV30H	16	56-371	HR39N	1
Columbia			Piezo			SS14	HR81C	15	N75-EJ			56-403B	HR51F	2
CP900	HR81C	15	Y250	HR81C	15	ST4	HR81C	15	Type II	FV31J	16	56-421B	HR51F	2
JN33D	HR81C	15	Y610	HR81C	15	Lenco			N95-ED	FV33L	24	56-442B	HR51F	2
JN38D	HR81C	15	YM308	HR79L	39	VM95P	HR49D	33	N97-HE	FV34M	26	56-480	HR39N	1
JN78D	HR81C	15	Pioneer			Luxor			Sonotone			142-124	HR39N	1
Decca			PLN3	HR81C	15	65977	HR81C	15	V100	HR61R	35	142-146	HR51F	2
Binofluid	HR51F	2	Rigonda			SC501	HR81C	15	2109	FQ45Y	14	Webster		
Dual			2SB	FM70M	30	Magnavox			2509	FQ45Y	14	MC-1	HR39N	1
DN32S	FV19V	16	560*83	HR39N	1	MicroSound			2539	FQ45Y	14			
Electronic Reproducers			120*1ST	HR81C	15	ERHC3/2SB	FM70M	30						

RECORD CARE PRODUCTS

Hi-Fi Care Kit



A very popular care kit containing a high quality cleaning arm, cassette head cleaning tape, velvet pad record cleaner, stylus brush and a 20cc bottle of cleaning fluid. Attractively packaged with instructions.

Order

YB47B (Hi-Fi Care Kit)..... £4.95

Record Cleaning Arm



A record cleaning brush that cleans the record while it is playing. It looks like a miniature high quality pick-up arm and is finished in black. The base is weighted so that it may be used free-standing or it can be fixed by removing protective backing from self-adhesive base. The aluminium arm has its own armrest and the heavy counterweight gives a tracking weight of about 2½gms to ensure that the brush that sweeps the grooves and the velvet roller that collects the dust do not slow down the record speed appreciably. Arm height is adjustable to suit most turntables. The velvet roller may be set in eight positions so as to present fresh cleaning surfaces to the record. A separate brush for cleaning the roller is provided. Supplied with instructions.

Order

LX06G (Cleaning Arm)..... £3.45

Record Cleaning Cloth

NEW



An anti-static cleaning cloth for removing damaging dust and grit from record grooves. Can also be used for cleaning TV screens, hi-fi equipment and all plastic surfaces. Cloth is impregnated with cleaning fluid and comes in re-sealable plastic bag. Size 260 x 168mm.

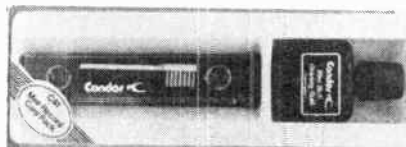
Order

FV36P (Record Clean Cloth)..... 60p



0702 552911

Record Cleaner



A velvet record cleaning pad, with a protective plastic cap. The ends slide open to reveal holes where the supplied cleaning fluid can be inserted to moisten the pad. The top also holds a stylus brush.

Order

FR48C (Record Cleaner)..... £2.95

Conductive Fibre Record Cleaner



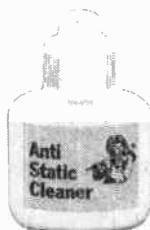
The record cleaner has a million tiny conductive fibre filaments to discharge and remove dust particles from the base of the record grooves.

Order

YW82D (Fibre Cleaner)..... £4.95

Anti-Static Cleaner

NEW



A small bottle of anti-static cleaning fluid, suitable for use with cleaning cloths, cotton buds etc, and re-moistening 'ioniser pads' (conductive record cleaner brushes). Can be used on tape heads, records, TV screens, hi-fi equipment, glass and all plastic surfaces. Bottle has applicator nozzle.

Order

FV35Q (Anti-stat Cleaner)..... 50p

Stylus Cleaning Fluid

NEW



However scrupulously clean you may keep your record collection, the stylus will inevitably collect the remaining microscopic particles deep down in the groove. This deposit concentrates and grows, attracting more dirt and altering the shape of the stylus and its tracking performance and hence, the quality of the sound, as well as accelerating record wear. This especially formulated stylus cleaning fluid will remove stubborn deposits of this nature. Supplied with stylus brush and instructions for use.

Order

FV38R (Stylus Cleanr Fluid)..... 98p

Stylus Microscope

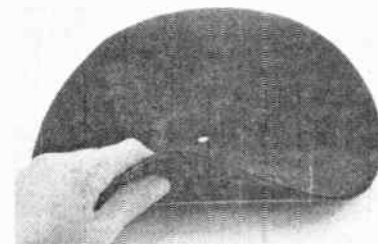


A microscope for inspecting styli etc. Size 40mm long, 16mm diameter. Good quality optics.

Order

YX93B (Stylus Microscope)..... £1.98

Anti-Static Turntable Mat



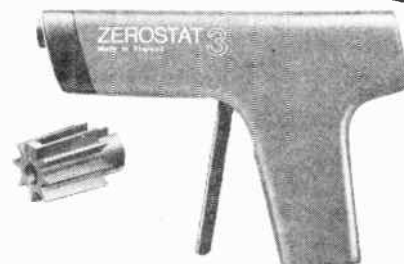
A fibre turntable mat that reduces the static on a disc while it is playing. It is the static charge on discs that causes them to attract dust and this mat will greatly reduce this. The mat also holds the disc firmly on the platter reducing ambient rumble and lateral movement which will improve clarity in the bass on the disc.

Order

LX10L (Anti-Stat Mat)..... £3.95

Anti-Static Gun

NEW



A piezo-electric type anti-static pistol which will remove the electrostatic charge from records, photographic film and plastic surfaces. On squeezing the trigger the gun projects a stream of positive ions - negative ions are produced on releasing the trigger - that will cover an area approximately 16 inches wide. The gun should be approximately 12 inches from the surface. This anti-static gun includes a newly developed ion indicator which can be inserted into the nozzle of the gun for testing purposes, and incorporates a neon lamp which glows when the gun has been 'fired'. It is recommended that the end of the indicator be held against an earthed metal object e.g. water pipe, radiator, for this test. The gun cannot function normally with the indicator fitted. Life, 50,000 operations.

Order

YJ93B (Anti-Stat Gun)..... £9.95

Stylus Balance

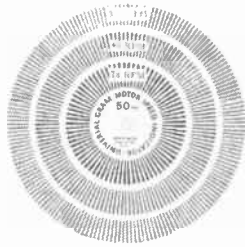


Precision made knife-edge type stylus balance for exact measurement and adjustment of stylus pressure. A small weight is used to counter balance the tone-arm, and fits into one of a number of graduated holes. Calibrated in ¼ gram steps from ½ to 5 grams. Base has a non-slip surface.

Order

FR49D (Stylus Balance)..... 98p

Record Turntable Speed Indicator

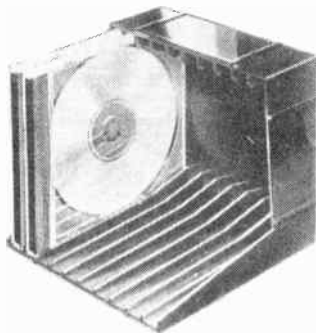


Place this indicator on record player turntable and view with a mains lamp or neon. With turntable rotating at precise speed (33 1/3, 45 or 78 rpm) spokes on indicator appear stationary. One side is calibrated for 50Hz mains and the other for 60Hz mains.

Order

FR50E (Gram Speed Indicator) 10p

Compact Disc Box



A storage system which will hold up to ten digital audio Compact Discs, allowing for easy access. It can be wall or shelf mounted, and is stackable. Dimensions H140 x W130 x D145mm overall. Colour black.

Order

YJ27E (Compact Discbox) £3.95

CASSETTE CARE PRODUCTS

NOTE: All cassette care products can be successfully used with computer cassette players and car cassette players.

Tape Head Care Kit



A kit comprising a multi-purpose tool and a 20cc bottle of cleaning fluid. The specially shaped 'bits' for the tool allow access to concealed heads e.g. car cassette heads, for inspection, dusting and cleaning.

Order

FG73Q (Tape Head Kit) £2.50

Tape Editing And Care Kit

A must for all tape recorder enthusiasts, the kit comprises a splicing block for cassette (1/4in) and 1/2in tapes, a cutting blade, a roll of splicing tape, a cassette head cleaner tape, a tape head cleaning stick and a 30cc bottle of tape head and capstan cleaning fluid.



Order

YB56L (Edit and Care Kit) £3.95

Tape Head and Capstan Cleaner

A 20cc bottle of head and capstan cleaner, with a double-ended cleaning tool. One end has a velvet pad and the other a soft brush.



Order

FG74R (Head + Capstan Kit) £1.20

Safeclene

A tape drive cleaning fluid with an internationally approved solvent for cleaning delicate equipment. It is used with Safewipes and Safebuds for cleaning tape drives. It will dissolve light oil and grease, and leaves no residue and will not affect sensitive plastics. Supplied in 439gm aerosol can.



Order

YK89W (Safeclene Spray) £4.95

Cassette Head Cleaner Tape



A non-abrasive head cleaner tape for cassette recorders. If used regularly (approximately once every 10 hours of playing time) it will preserve the best sound performance for recording or playback from your recorder. Instructions supplied.

Order

FV37S (Cas Head Clean Tape) 98p

Cassette Head Cleaner and Demagnetiser



This cassette contains a special cleaning tape, but also incorporates a revolving magnet which quickly demagnetises the tape heads as well as cleaning them. Packed in a plastic library case.

Order

YW89W (Cassette Cln & Demag) £2.50

Cassette Care Kit

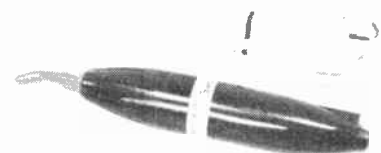


A cassette head cleaner and demagnetiser packaged together with a 30cc bottle of tape cleaning fluid and a double-ended cleaning tool.

Order

BK28F (Deluxe Head Cleaner) £2.95

Tape Head Demagnetiser

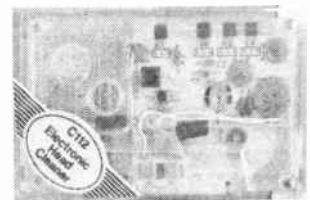


Tape head demagnetiser that operates directly on 240V AC mains. It produces a powerful alternating magnetic field which quickly demagnetises the tape heads. The tool has a curved flattened probe for cassette recorders or any difficult to reach head.

Order

FQ62S (Curved Demagnetiser) £3.95

Electronic Head Demagnetiser



An electronic head demagnetiser cassette powered by a hearing aid type battery. This item comes complete with case, battery and operating instructions. Particularly suited to car cassette players and other units where limited access makes demagnetisation difficult.

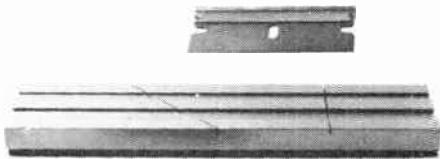
Order

BK27E (Elec. Head Demag.) £9.95



0702 552911

Tape Splicing Block



A professional, accurately machined aluminium block for cassette (1/4in) tape and 1/4in tape. The block has 45° and 90° cutting guides and a non-slip base. Overall size: 111 x 25 x 7mm. Supplied with tape cutting blade.

Order
YW91Y (Splicing Block)..... £2.50

Splicing Tape



A high quality splicing tape on a reel with cover. Suitable for 1/4in or 1/4in tape. Adhesive does not ooze.

Order
LX17T (Splicing Tape)..... 78p

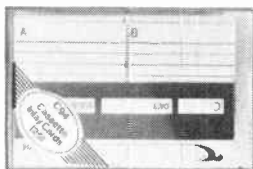
Library Case



An empty plastic library case for cassette tape.

Order
RB03D (Cassette Case)..... 28p

Cassette Index Cards



Blank index cards for library containers. Pack of 25.

Order
FR60Q (Index Cards)..... £2.45

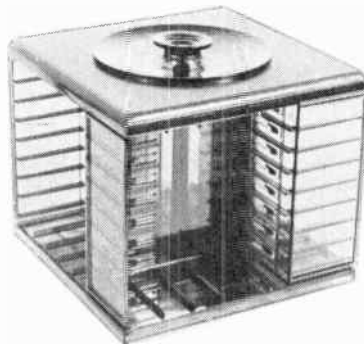
Cassette Fast Hand Winder



Very simple and easy to use cassette fast winder enables you to wind tape in one cassette while you are listening to another. If you have a battery recorder always use the fast winder to save the high battery consumption while fast winding. This winder will wind a C90 cassette in 60 seconds – faster than most recorders.

Order
RB01B (Cassette Fast Winder)..... £2.95

Cassette Rota-Rack



An attractive transparent smoke grey plastic cassette rack that revolves on a circular base. Four compartments will each hold eight cassettes not in their library cases, horizontally or five cassettes in their library cases vertically. Thus giving maximum storage for between 20 and 32 cassettes. When fully loaded the rack requires a space of 250mm diameter to revolve in and the height is 140mm. Supplied in a neat flat pack and easily assembled.

Order
RB07H (Rota-Rack)..... £1.95

SPARE PARTS FOR CASSETTE RECORDERS

Drive Belts

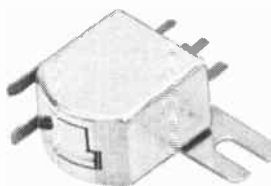


A range of good quality drive belts for use with cassette recorders. The following sizes are available: Diameters 46mm, 57mm, 66mm, 71mm, 76mm and 90mm.

Order
YX76H (Drive Belt 46mm)..... 80p
YX77J (Drive Belt 57mm)..... 80p
YX78K (Drive Belt 66mm)..... 80p
RK99H (Drive Belt 71mm)..... 98p
YX79L (Drive Belt 76mm)..... 80p
YX80B (Drive Belt 90mm)..... 80p

Cassette Tape Heads

Stereo Sendust

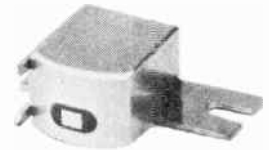


A long-life very high quality sendust cassette tape head with standard fixing bracket. Designed for use on stereo cassette recorders as the record and/or playback head. Has tape guide fitted.

Specification
 DC Resistance: 280Ω
 Impedance: 1KΩ at 1kHz
 Record current: 41μA (at 333Hz)
 Bias current: 450μA at 80kHz
 Playback sensitivity: 330μV at 333Hz (-68dB ±2dB)
 Dimensions of head: Width: 10.5mm
 Depth: 15.5mm
 Height: 8.5mm
 Bracket fixing centres: 17-19mm x M2 clear

Order
FQ63T (Send Cassette Head)..... £12.95

Standard Mono



A standard quality replacement cassette tape head with standard fixing bracket. Designed for use on mono cassette recorders as the record and/or playback head. Has tape guide fitted.

Specification
 DC Resistance: 250Ω
 Impedance: 650Ω at 1kHz
 Record current: 50μA
 Bias current: 400μA at 50kHz
 Playback sensitivity: 550μV at 330Hz
 Dimensions of head: Width: 11mm
 Depth: 12.6mm
 Height: 8.5mm
 Bracket fixing centres: 17mm x M2 clear

Order
FQ64U (Mono Cassette Head)..... £3.45

Erase



A standard quality replacement cassette tape head with standard fixing bracket. Designed for use on mono or stereo cassette recorders as the erase head. Has tape guide fitted.

Specification
 DC Resistance: 5Ω
 Impedance: 190Ω at 100kHz
 Erase current: 50mA
 Dimensions of head: Width: 10.5mm
 Depth: 12.4mm
 Height: 9.2mm
 Bracket fixing centres: 15.5mm x M2 clear

Order
FQ66W (Cassette Erase Head)..... £1.95

Standard Stereo



A standard quality replacement cassette tape head with standard fixing bracket. Designed for use on stereo cassette recorders as the record and/or playback head. Has tape guide fitted.

Specification
 DC Resistance: 220Ω
 Impedance: 850Ω at 1kHz
 Record current: 35μA
 Bias current: 350μA at 50kHz
 Playback sensitivity: 250μV at 333Hz
 Dimensions of head: Width: 11mm
 Depth: 12.6mm
 Height: 8.5mm
 Bracket fixing centres: 17mm x M2 clear

Order
FQ65V (Stereo Cassette Head)..... £3.95

CASSETTE TAPES

Maxell, Scotch and TDK



Presenting an extensive range of top quality audio cassette tapes selected from some of the world's leading manufacturers of magnetic tape. The different grades of ferrous/normal, chrome-dioxide and metal formulated cassette tapes we have available are as follows.

Normal

Cassette tapes utilising a fine-grained ferric-oxide coating for high sensitivity and minimum background noise. The BX, D and UL types are an ideal low cost choice for general purpose usage with consistently good performance. The CX, AD and UDI types offer improved high frequency response with lower background noise, and the XSI, AD-X and XLI feature an extended treble response with low distortion, having ultra-fine particle layers which allow more powerful bass response and very high saturation levels. The XLI-S offers the best performance from recorders using normal bias and EQ, having wide bias latitude and a performance nearly equal to chrome-dioxide, and has a precision injection moulded cassette shell designed to preserve phase accuracy. All types available with total playing times of 60 and 90 minutes.

CrO₂

Chrome-dioxide tapes provide a frequency response, dynamic range and signal-to-noise ratio much superior to ferric-oxide tapes. Cassette shells are precision injection moulded for best phase characteristics. Types XSII, SA and UDII will accept high recording levels over the full audio band providing high output with very low inherent tape noise. The SA-X and XLII types offer an even better signal-to-noise ratio and crystal clear clarity. All types available in both 60 and 90 minute sizes. The XLII-S offers slightly more dynamic range and 0.5dB less noise, with a wider bias latitude. Types HXS60 and 90 are unusual in that they are of the highest performance metal particle formulation but are CrO₂ compatible, giving recorders with only normal or CrO₂ bias access to metal tape fidelity.

Order

CT00A (Scotch BX-C60)	70p
CT01B (Scotch BX-C90)	82p
CT06G (Scotch CX-C60)	86p
CT07H (Scotch CX-C90)	£1.04
CT13P (Scotch XSI-C60)	96p
CT14Q (Scotch XSI-C90)	£1.18
CT21X (Scotch XSII-C60)	£1.25
CT22Y (Scotch XSII-C90)	£1.50
CT32K (Scotch XSMIV-C60)	£2.20
CT33L (Scotch XSMIV-C90)	£2.65
CT02C (TDK D-60)	80p
CT03D (TDK D-90)	£1.05
CT08J (TDK AD-60)	£1.10
CT09K (TDK AD-90)	£1.45



Metal

Cassette tapes of the modern high performance metal formulation can offer a dynamic range of up to twice the capability of CrO₂ tapes, with all other parameters to match, able to accept extremely high recording levels, with a high tolerance for inexact

bias latitude, giving recordings of great clarity and detail. Metal tapes are resistant to oxidation, ensuring optimum long life performance with any metal compatible cassette deck. The MA-R60 and 90 cassettes comprise tape as MA types contained in a precision die-cast alloy cassette shell.

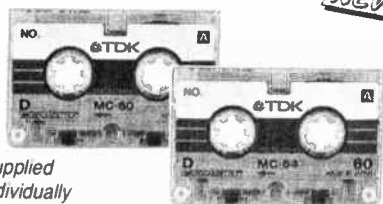
Oxide	Scotch		TDK		Maxell	
	Type	Stock Code	Type	Stock Code	Type	Stock Code
Normal	BX 60	CT00A	D-60	CT02C	UL 60	CT04E
	BX 90	CT01B	D-90	CT03D	UL 90	CT05F
	CX 60	CT06G	AD-60	CT08J	UDI 60	CT10L
	CX 90	CT07H	AD-90	CT09K	UDI 90	CT11M
	XSI 60	CT13P	AD-X60	CT15R	XLI 60	CT17T
	XSI 90	CT14Q	AD-X90	CT16S	XLI 90	CT18U
CrO ₂	XSII 60	CT21X	SA-60	CT23A	UDI-S 60	CT19V
	XSII 90	CT22Y	SA-90	CT24B	XLI-S 90	CT20W
			SA-X60	CT26D	XLII 60	CT28F
			SA-X90	CT27E	XLII 90	CT29G
			HXS60	CT30H	XLII-S 60	CT41U
			HXS90	CT31J	XLII-S 90	CT42V
Metal	XSMIV 60	CT32K	MA-60	CT34M	MX 60	CT36P
	XSMIV 90	CT33L	MA-90	CT35Q	MX 90	CT37S
			MA-R60	CT38R		
			MA-R90	CT39N		

CT15R (TDK AD-X60)	£1.25
CT16S (TDK AD-X90)	£1.65
CT23A (TDK SA-60)	£1.34
CT24B (TDK SA-90)	£1.90
CT26D (TDK SA-X60)	£1.55
CT27E (TDK SA-X90)	£2.20
CT30H (TDK HXS-60)	£2.00
CT31J (TDK HXS-90)	£2.85
CT34M (TDK MA-60)	£2.35
CT35Q (TDK MA-90)	£3.35
CT38R (TDK MA-R60)	£3.75
CT39N (TDK MA-R90)	£5.25
CT04E (Maxell UL-C60)	69p
CT05F (Maxell UL-C90)	£1.00

CT10L (Maxell UDI-C60)	95p
CT11M (Maxell UDI-C90)	£1.30
CT17T (Maxell XLI-C60)	£1.25
CT18U (Maxell XLI-C90)	£1.55
CT19V (Maxell XLI-S60)	£1.38
CT20W (Maxell XLI-S90)	£1.80
CT12N (Maxell UDII-C60)	£1.20
CT25C (Maxell UDII-C90)	£1.45
CT28F (Maxell XLII-C60)	£1.30
CT29G (Maxell XLII-C90)	£1.85
CT41U (Maxell XLII-S60)	£1.49
CT42V (Maxell XLII-S90)	£2.00
CT36P (Maxell MX-C60)	£1.90
CT37S (Maxell MX-C90)	£2.80

Micro Cassette

NEW



Supplied individually

A micro cassette for dictation machines and compact Micro Cassette players. The D-MC60 is a ferric-oxide tape ideal for speech and general purpose use including music, total playing time 60 minutes.

Order

CT40T (D Micro MC-60) £3.75

Low-Cost Cassette Tapes



Good quality, low noise cassette tapes offering incredible value for money. Available in C60 or C90 sizes.

Order

YG25C (Cassette Tape C60) 45p
YG26D (Cassette Tape C90) 60p

VIDEO ACCESSORIES

Video Tape Head Cleaner Aerosol



Removes contaminants from all magnetic tape heads, but is especially formulated for critical video recording heads. Ensures peak response and best quality reproduction. It is electrically inert and safe in contact with all paints, rubbers and plastics. Leaves no residue.

Supplied in 110gm aerosol can.

Order

YJ46A (Video Tape Hd Clnr) £1.35

Wet/Dry Video Head Cleaning Tapes

NEW



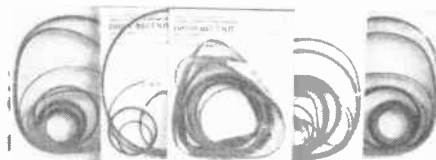
If there is one form of tape recording machine that is exceptionally fussy about tape head cleanliness it must be the home video recorder. Because the video head has to be able to record or playback signals on video tape at a frequency bordering on the limits of tape recording as a medium (typically 6MHz), even moderate deposits of dirt and grit can be sufficient to cause enough drop-out so as to lose the picture entirely. These video head cleaner cassettes contain a white fibre tape onto which a cleaner fluid is sprayed (aerosol supplied). The cassette is then played in the machine for 10 seconds during which time the fluid will act on the video head drum and all other heads and tape guides, which are then dried off by following dry tape. The tape is not reuseable and the cassette must be replaced as the end of the tape is reached. Do not use more often than necessary. Recommended usage: once for each 50 hours of playing time. Instructions on the cassette.

Available for VHS and Beta systems

Order

FV39N (VHS Video Head Clean) £6.95
FV40T (BETA Video Head Clnr) £6.95

Video Recorder Drive Belts



A range of kits containing a complete set of drive belts, for the most popular video recorders.

Type Use with Video Recorders type:

VSK9707 Ferguson 3292, Baird 3V22; JVC HR3300/3320/3330/3600.
VSK9806 Sony SL8000/8080.
VSK9876 Sony SLC7/SLJ7.
VSK9708 Ferguson 3V16, JVC HR3360/3660, Telefunken VR440.
VSK9794 Sanyo VTC9300, Fisher VRS7000.
VSK9605 National Panasonic NV7200.
VSK9635 National Panasonic NV7000.

Order

FJ06G (Video Belts VSK97C7) £2.40
FJ07H (Video Belts VSK9806) £2.40
FJ08J (Video Belts VSK9876) £2.40
FJ09K (Video Belts VSK97C8) £2.40
FJ10L (Video Belts VSK9794) £2.40
FJ11M (Video Belts VSK9605) £2.40
FJ12N (Vdeo Belts VSK9635) £2.40

Video Enhancer

A video/audio controller designed to improve the TV picture quality when dubbing or playing back home video, and is instrumental in improving poor recordings. A recording can be made on two VTR's at the same time, while audio can be recorded in stereo, or left and right channels may be mixed for recording in a mono system VTR. On playback the VTR can transmit to a remote TV monitor via 75Ω coaxial cable up to 100 metres in length, without degrading picture quality. Controls are provided for the precise adjustment of contrast and colour for optimum results. A filter will eliminate noise in the ALC circuit caused by repeated dubbing operations. Requires 1 PP9 battery (not supplied), or an external 9V supply via a DC input jack socket.



Order

XG59P (Video Enhancer VH607) £29.95

RESISTORS

Joysticks	292	Presets	289	Thermistors	293
Potentiometers	290	Slide Potentiometers	291	Wirewound Resistors	287

RESISTORS How To Order Resistors

To each range of resistors that we stock, we have allocated a code letter as follows:

Type	Code Letter	Description
Carbon Film 1/8W	U	Micro Res
Carbon Film 1/4W	B	Econ Res
Metal Film 0.6W	M	Min Res
Carbon Film 1/2W	S	Std Res
Carbon Film 1W	C	1W Res
Metal Oxide 1/2W	X	Oxide
Thick Film 1/2W 1%	T	1% Res
3W Wirewound	W	W/W Min
7W Wirewound	L	7W W/W
10W Wirewound	H	10W W/W
25W Wirewound	P	25W W/W
High Voltage Resistor	V	HV Res
Min Resistors in 10's	A	10 of one value of Min Res

Please note that the Metal Oxide (X), Thick Film (T), Metal Film 0.4W (M), and Carbon Film 1/2W (S) resistors have now all been replaced by the new Metal Film resistor with the Order Code M, now rated at 0.6W.

To order a particular resistor simply write the code letter followed by the value.

Examples

To Order	Write	To Order	Write
Min Res 1.8R	M1.8R	W/W Min 0.22R	W0.22
Min Res 1k	M1K	10W W/W 0.47R	H0.47
HV Res 2M2	V2M2	1W Res 2k7	C2K7

Carbon Film 1/8W

High Stability, Low Noise

Working Voltage (max):	150V
Tolerance:	±5%
Power Rating:	1/8W at 70°C
Temperature coefficient:	-300ppm/°C up to 100kΩ rising to -500ppm/°C at 1MΩ
Noise Level:	<0.5µV/V
Dimensions of body:	4.1mm long, 1.8mm dia.

The following values (Ω) only are available

10Ω	100Ω	1k	10k	100k	1M
15Ω	150Ω	1k5	15k	150k	
2.2Ω	22Ω	220Ω	2k2	22k	220k
3.3Ω	33Ω	330Ω	3k3	33k	330k
4.7Ω	47Ω	470Ω	4k7	47k	470k
6.8Ω	68Ω	680Ω	6k8	68k	680k

To order write 'U' and then the value.

E.g. U4.7R, U15R, U330R, U1K, U22K, U680K etc.

Order

U plus Value (Micro Res plus Value) 3p

Carbon Film 1/4W

High stability, low noise. This much reduced range is maintained to make available a low cost miniature resistor covering the values shown. For all other values, use our Metal Film 0.6W range for a superior product.

Working voltage (max):	250V
Tolerance:	±5%
Power rating:	1/4W at 70°C
Noise level:	Typical 0.5µV/V
Dimensions of body:	8mm long, 2.8mm dia.

The following values only are available:

1Ω, 1.2Ω, 1.5Ω, 1.8Ω, 2.2Ω, 2.7Ω, 3.3Ω, 3.9Ω, 4.7Ω, 5.6Ω, 6.8Ω, 8.2Ω, 1M2, 1M5, 1M8, 2M2, 2M7, 3M3, 3M9, 4M7, 5M6, 6M8, 8M2, 10M.

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All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

To order write 'B' and then the value.

E.g. B1.2R, B3.9R, B2M7, B3M9, B10M etc.

Order

B plus Value (Econ Res plus Value) 2p

Metal Film 0.6W

A 'Universal Resistor' with a superb specification. It may be used as a superior replacement wherever carbon film 1/4W, 1/2W or 1/2W are specified since its size is the same as 1/4W types, yet it can be run continuously at 0.6W with ambient temperatures up to 70°C, thanks to the highly even thermal characteristics of the ceramic substrate. It is also a superior replacement to most metal oxide and thick film resistors due to its very tight tolerance, ±1%, and its low temperature coefficient, only 50ppm.

The resistors are very easy to use as they are made with the traditional 3 colour bands indicating the value, and a fourth brown band indicating the tolerance, ±1%. A fifth red band, indicating the temperature coefficient, 50ppm, is provided so that the resistor value cannot be accidentally read the wrong way round, since no value begins red, brown (21..).

These resistors are also available in packs of ten of any one value at a considerable cost saving.

Working voltage max:	250V
Tolerance:	±1%
Power rating:	0.6W at 70°C
Temperature coefficient:	50ppm/°C
Noise level:	Typically 0.01µV/V
Dimensions of body:	6.5mm long, 2.5mm diameter

Note that to make up 'odd' values not stocked, resistor networks may be built and if all the resistors in the network have a 1% tolerance, then the tolerance of the whole network will still be 1% tolerance.

The following values (Ω) only are available

1Ω	10Ω	100Ω	1k	10k	100k	1M	10M
	11Ω	110Ω	1k1	11k	110k		
1.2Ω	12Ω	120Ω	1k2	12k	120k	1M2	
	13Ω	130Ω	1k3	13k	130k		
1.5Ω	15Ω	150Ω	1k5	15k	150k	1M5	
	16Ω	160Ω	1k6	16k	160k		
1.8Ω	18Ω	180Ω	1k8	18k	180k	1M8	
	20Ω	200Ω	2k	20k	200k		
2.2Ω	22Ω	220Ω	2k2	22k	220k	2M2	
	24Ω	240Ω	2k4	24k	240k		
2.7Ω	27Ω	270Ω	2k7	27k	270k	2M7	
	30Ω	300Ω	3k	30k	300k		
3.3Ω	33Ω	330Ω	3k3	33k	330k	3M3	
	36Ω	360Ω	3k6	36k	360k		
3.9Ω	39Ω	390Ω	3k9	39k	390k	3M9	
	43Ω	430Ω	4k3	43k	430k		
4.7Ω	47Ω	470Ω	4k7	47k	470k	4M7	
	51Ω	510Ω	5k1	51k	510k		
5.6Ω	56Ω	560Ω	5k6	56k	560k	5M6	
	62Ω	620Ω	6k2	62k	620k		
6.8Ω	68Ω	680Ω	6k8	68k	680k	6M8	
	75Ω	750Ω	7k5	75k	750k		
8.2Ω	82Ω	820Ω	8k2	82k	820k	8M2	
	91Ω	910Ω	9k1	91k	910k		

To order write 'M' and then the value.

E.g. M1.2R, M15R, M180R, M2K2, M27K, M330K, M3M9 etc.

To order a pack of ten of any one value write 'A' and then the value.

E.g. A1.2R, A15R etc. Note that if you order one A1.2R you will receive ten M1.2R and so on.

Order

M plus Value (Min Res plus Value) Prices M1R to M8R2 12p
M10R to M1M 3p
M1M2 to M10M 12p

A plus Value (Respack plus Value) Prices A1R to A8R2 95p
A10R to A1M 19p
A1M2 to A10M 95p

Starter Pack E12

A development pack of Min Resistors containing ten of each of the following values, 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68 and 82Ω, plus all the decades up to 1MΩ. 610 resistors in all.

Order

FA08J (E12 Resistor Pack) £9.95

Starter Pack E24

A development pack of Min Resistors containing ten of each of the values, 1Ω to 1MΩ as shown in the 'Min Res' table on the previous page. 1330 resistors in all.

Order

FA09K (E24 Resistor Pack) £19.95

Starter Pack MΩ Values

A pack of Min Resistors containing ten of each of the following values 1.2M, 1.5M, 1.8M, 2.2M, 2.7M, 3.3M, 3.9M, 4.7M, 5.6M, 6.8M, 8.2M and 10MΩ. 120 resistors in all.

Order

FA10L (Mega Resistor Pack) £9.95

Carbon Film 1W



High stability, Low noise

Working voltage: 750V max
 Tolerance: ±5%
 Power rating: 1W at 40°C
 Temperature coefficient: -180 to -500ppm/°C
 Noise level: <0.5μV/V
 Dimensions of body: 16mm long, 6.8mm dia.

The following values (Ω) only are available:

10Ω	100Ω	1k	10k	100k	1M	10M
12Ω	120Ω	1k2	12k	120k	1M2	
15Ω	150Ω	1k5	15k	150k	1M5	
18Ω	180Ω	1k8	18k	180k	1M8	
22Ω	220Ω	2k2	22k	220k	2M2	
27Ω	270Ω	2k7	27k	270k	2M7	
33Ω	330Ω	3k3	33k	330k	3M3	
39Ω	390Ω	3k9	39k	390k	3M9	
47Ω	470Ω	4k7	47k	470k	4M7	
56Ω	560Ω	5k6	56k	560k	5M6	
68Ω	680Ω	6k8	68k	680k	6M8	
82Ω	820Ω	8k2	82k	820k	8M2	

To order write 'C' and then the value.

E.g. C22R, C270R, C3K3, C3K9, C470K, C5M6 etc.

Order

C plus Value (1W Res plus Value) 6p

Metal Film 0.4W

Wherever these resistors are specified, the 0.6W Min Res will prove a superior replacement.

Metal Oxide ½W 2% (X)

Wherever these resistors are specified, Min Res will prove a superior replacement.

Thick Film ½W 1% (T)

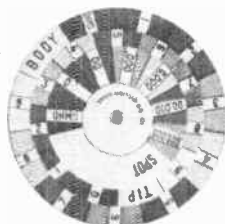
Wherever these resistors are specified, Min Res will prove a superior replacement.

Carbon Film ½W 5% (S)

Wherever these resistors are specified, Min Res will prove a superior replacement.

Resistor Colour Wheel

Simply set the three colours on the calculator wheel in the same sequence as on the resistor and read off the value.



Order

XL05F (Colour Wheel) 25p

RESISTOR COLOUR CODES

All our resistors except wirewound have coloured bands on them indicating their resistance value and tolerance.

The first band on the body of the resistor indicates the first figure of the value, the second band indicates the second figure of the value. The third band indicates the amount by which the first two numbers must be multiplied. (Except for Gold and Silver, it may be easier to remember that band 3 may be read in the same way as band 1 and 2, i.e. that Red = 2, Orange = 3 etc — Black means no zeros — except that in this case it indicates the number of zeros which follow the first two numbers). The fourth band indicates the tolerance, and the fifth band, if there is one, indicates the temperature coefficient in parts per million (ppm) per degree Centigrade.

You may also come across resistors where the value is denoted by four colour bands with one or two other bands denoting tolerance and temperature coefficient. On these resistors the first three bands indicate the numerical value and the fourth band the multiplier and so on.

However, for the resistors we supply the colour code is read as follows.

Colour	Band 1 1st Figure	Band 2 2nd Figure	Band 3 Multiplier	Band 4 Tolerance	Band 5 Temperature Coefficient
Black	0	0	x1		200ppm/°C
Brown	1	1	x10	1%	100ppm/°C
Red	2	2	x100	2%	50ppm/°C
Orange	3	3	x1000		15ppm/°C
Yellow	4	4	x10,000		25ppm/°C
Green	5	5	x100,000	0.5%	
Blue	6	6	x1,000,000	0.25%	10ppm/°C
Violet	7	7	x10,000,000	0.1%	5ppm/°C
Grey	8	8			1ppm/°C
White	9	9			
Gold			x0.1	5%	
Silver			x0.01	10%	
None				20%	

Examples

Band 1	Band 2	Band 3	Band 4	Value
Brown	Black	Black	Gold	Gold = 10 x 1 = 10 ohms at 5%
Red	Violet	Gold	Brown	Brown = 27 x 0.1 = 2.7 ohms at 1%
Green	Blue	Yellow	Red	Red = 56 x 10,000 = 560k ohms at 2%
Grey	Red	Green	Silver	Silver = 82 x 100,000 = 8.2M ohms at 10%

HIGH POWER RESISTORS

3 Watt



Type:	4.7Ω and less	10Ω and over
Tolerance:	Wirewound ±5%	Metal Film ±5%
Power rating at 70°C:	2.5W	2.5W
Power rating at 25°C:	3W	3W
Temperature coefficient:	≤299ppm/°C	≤500ppm/°C
Dimensions of body (length x dia.) mm:	10.5 x 5.2	16.7 x 5.2

The following values (Ω) only are available:

1Ω	10Ω	100Ω	1k	10k
		120Ω		
		15Ω	1k5	15k
0.22Ω	2.2Ω	22Ω	220Ω	2k2
0.27Ω			270Ω	
0.33Ω		33Ω	330Ω	3k3
	3.9Ω			
0.47Ω	4.7Ω	47Ω	470Ω	4k7
		68Ω	680Ω	6k8

To order write 'W' and then the value.

E.g. W0.22, W1R, W15R, W330R, W6K8, W10K etc.

Order

W plus Value (W/W Min plus Value) Prices W0.22R to W1R 30p
 W2R2 to W22K 20p

PHONE NOW
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Access, Visa, American Express, Mapcard.
 Phone before 2pm for same day despatch.

7-Watt Wirewound

A cement coated wirewound resistor offering high power ratings in a small case size.

Tolerance:	≥1Ω ±5%
	<1Ω ±10%
Power rating at 70°C:	6W
Power rating at 20°C:	7W
Temperature coefficient:	≤200ppm/°C Max
Dimensions of body:	19 mm long x 7.4mm dia.

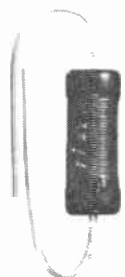
The following values (Ω) only are available:

1Ω	10Ω	100Ω	1k
	15Ω		
2.2Ω	22Ω	220Ω	2k2
3.3Ω			
0.47Ω	4.7Ω	47Ω	470Ω
			4k7

To order write 'L' and then the value.
E.g. L0.47, L3.3R, L22R, L100R, L4K7 etc.

Order

L plus Value (7W W/W plus Value) 33p



10 Watt Wirewound

A cement coated wirewound resistor offering high power ratings in a small case size.

Tolerance:	≥1Ω ±5%
	<1Ω ±5%
Power rating at 70°C	9W
Power rating at 20°C	11W
Temperature coefficient:	≤200ppm/°C
Dimensions of body:	34mm long x 7.4mm dia.

The following values (Ω) only are available:

1Ω	10Ω	100Ω	1k
	15Ω		
2.2Ω	22Ω	220Ω	2k2
3.3Ω			
0.47Ω	4.7Ω	47Ω	470Ω
			4k7

To order write 'H' and then the value.
E.g. H0.47, H2.2R, H15R, H470R, H2K2 etc.

Order

H plus Value (10W W/W plus Value) 42p



25 Watt Wirewound

A high quality, high power, wirewound resistor built into an aluminium casing to aid dissipation.

Tolerance:	±5%
Power rating at 70°C:	25W
Power rating without heatsink:	12.5W
Minimum heatsink for 25W at 25°C:	4.5°C/W
Working voltage (max):	550V AC/DC
Temperature coefficient 0.47Ω:	90ppm/°C
1Ω to 47Ω:	50ppm/°C
100Ω:	25ppm/°C

Dimensions:	Length:	28mm
	Width:	28mm
	Height:	14.5mm
	Fixing centres:	18.3 x 19.8mm x 6BA (M3) (2 holes)

The following values (Ω) only are available:

1Ω	10Ω	100Ω
2.2Ω		
3.9Ω		
0.47Ω	4.7Ω	47Ω
		8.2Ω

(3.9Ω and 8.2Ω are stocked for use as load resistors to replace loudspeakers in 4Ω and 8Ω systems. They may be built up in series/parallel networks to suit any power system.)

To order write 'P' and then the value.
E.g. P0.47, P8.2R, P10R, P100R etc.

Order

P plus Value (25W W/W plus Value) £1.95



High Voltage Resistor

High stability, low noise carbon film resistors.

Working voltage 1M to 33M:	2500V AC, 3500V DC
47M:	7000V AC, 10,000V DC
Tolerance:	±5%
Power rating 1M to 33M:	½W at 70°C
47M:	1W at 70°C
Temperature coefficient:	±200ppm/°C
Noise level:	<0.5µV/V
Dimensions of body 1M to 33M:	10mm long x 3.7mm dia.
47M:	18mm long x 6.8mm dia.

The following values (Ω) only are available:

1M	2M2	4M7
10M	15M	22M
	33M	47M

To order write 'V' and then the value.
E.g. V1M, V4M7, V22M, V47M etc.

Order

V plus Value (HV Res plus Value) Prices V1M to V33M 15p
V47M 29p



RESISTANCE WIRE

A 1oz reel of 28swg Constantan (55-60% copper, 45-40% nickel) wire suitable for making rheostats etc. Can be used as a thermocouple when twisted with copper wire. A temperature difference between the wires of approx 25°C gives around 1mV with temperatures in the range 0°C to 50°C. Resistance: 4.2Ω per metre.

Order

BL64U (Constantan 28swg) £2.95



RESISTOR NETWORKS DIL Arrays

Thirteen equal value, discrete, thick-film resistors in a standard 14-pin DIL pack. Designed for use in logic pull-up or pull-down applications or anywhere where several close-tolerance resistors in one pack will simplify and neaten circuit board layout.

Working voltage:	100V max.
Tolerance:	±2%
Temperature coefficient:	±100ppm/°C
Power rating (one resistor):	150mW at 25°C, 100mW at 70°C
(whole package):	1.95W at 25°C, 1.25W at 70°C

The following values are available: 220Ω, 470Ω, 1k, 10k

Order

YY13P (Resnet 220R)	93p
YY14Q (Resnet 470R)	93p
YY15R (Resnet 1k)	93p
YY18U (Resnet 10k)	93p

SIL Arrays

Eight equal value, discrete thick film resistors in a narrow Single In-Line package, with 9 pins spaced at 0.1in. Ideal for use as pull-up/pull-down arrays for a parallel 8-way data bus etc, or anywhere where several commoned resistors are required, but must fit in a very confined PCB layout.

Dimensions of package:	23mm long x 2.5mm thick
Height from PCB:	6.5mm
Working voltage:	150V max
Tolerance:	±5%
Temperature coefficient:	±250ppm/°C
Power rating (one resistor):	125mW @ 70°C
(whole package):	1W

The following values are available:-
220Ω, 330Ω, 470Ω, 1k, 2k2, 4k7, 10k, 47k, 100k.

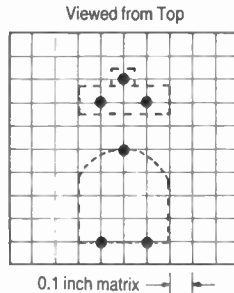
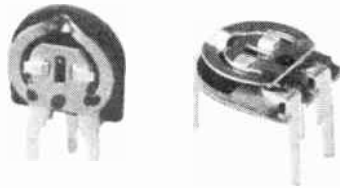
Order

RA24B (SIL Resistor 220R)	40p
RA25C (SIL Resistor 330R)	40p
RA26D (SIL Resistor 470R)	40p
RA27E (SIL Resistor 1k)	40p
RA28F (SIL Resistor 2k2)	40p
RA29G (SIL Resistor 4k7)	40p
RA30H (SIL Resistor 10k)	40p
RA31J (SIL Resistor 47k)	40p
RA32K (SIL Resistor 100k)	40p



PRESETS

Sub-Miniature Carbon Presets



Sub-miniature horizontal and vertical mounting, linear track preset controls. Power rating: 0.1W. Tolerance: $\pm 20\%$ The presets are either marked with their value or colour coded as follows:

Values Available	L.H. Tag	Centre Tag	R.H. Tag
100 Ω	Brown	Black	Brown
220 Ω	Red	Red	Brown
470 Ω	Yellow	Violet	Brown
1k	Brown	Black	Red
2k2	Red	Red	Red
4k7	Yellow	Violet	Red
10k	Brown	Black	Orange
22k	Red	Red	Orange
47k	Yellow	Violet	Orange
100k	Brown	Black	Yellow
220k	Red	Red	Yellow
470k	Yellow	Violet	Yellow
1M	Brown	Black	Green

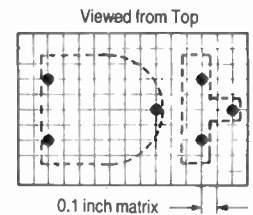
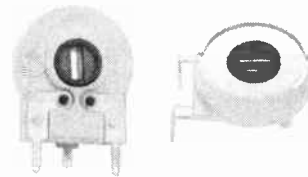
For Horizontal Types

Order		
WR52G	(Hor S-Min Prest 100R)	10p
WR53H	(Hor S-Min Prest 220R)	10p
WR54J	(Hor S-Min Prest 470R)	10p
WR55K	(Hor S-Min Prest 1k)	10p
WR56L	(Hor S-Min Prest 2k2)	10p
WR57M	(Hor S-Min Prest 4k7)	10p
WR58N	(Hor S-Min Prest 10k)	10p
WR59P	(Hor S-Min Prest 22k)	10p
WR60Q	(Hor S-Min Prest 47k)	10p
WR61R	(Hor S-Min Prest 100k)	10p
WR62S	(Hor S-Min Prest 220k)	10p
WR63T	(Hor S-Min Prest 470k)	10p
WR64U	(Hor S-Min Prest 1M)	10p

For Vertical Types

Order		
WR65V	(Vrt S-Min Prest 100R)	10p
WR66W	(Vrt S-Min Prest 220R)	10p
WR67X	(Vrt S-Min Prest 470R)	10p
WR68Y	(Vrt S-Min Prest 1k)	10p
WR69A	(Vrt S-Min Prest 2k2)	10p
WR70M	(Vrt S-Min Prest 4k7)	10p
WR71N	(Vrt S-Min Prest 10k)	10p
WR72P	(Vrt S-Min Prest 22k)	10p
WR73Q	(Vrt S-Min Prest 47k)	10p
WR74R	(Vrt S-Min Prest 100k)	10p
WR75S	(Vrt S-Min Prest 220k)	10p
WR76H	(Vrt S-Min Prest 470k)	10p
WR77J	(Vrt S-Min Prest 1M)	10p

0.25W Presets



Enclosed type presets with linear carbon tracks rated 0.25W at 40°C. Tolerance $\pm 20\%$ up to 220k, $\pm 30\%$ over 220k. Max. voltage 300V DC. Non-insulated slider operated by screwdriver from either side.

Available in the following values in vertical or horizontal types.

100 Ω , 220 Ω , 470 Ω , 1k, 2k2, 4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2, and 4M7

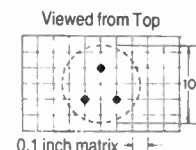
For Horizontal Types

Order		
WR78K	(Hor 0.25W Preset 100R)	12p
WR79L	(Hor 0.25W Preset 220R)	12p
WR80B	(Hor 0.25W Preset 470R)	12p
WR81C	(Hor 0.25W Preset 1k)	12p
WR82D	(Hor 0.25W Preset 2k2)	12p
WR83E	(Hor 0.25W Preset 4k7)	12p
WR84F	(Hor 0.25W Preset 10k)	12p
WR85G	(Hor 0.25W Preset 22k)	12p
WR86T	(Hor 0.25W Preset 47k)	12p
WR87U	(Hor 0.25W Preset 100k)	12p
WR88V	(Hor 0.25W Preset 220k)	12p
WR89W	(Hor 0.25W Preset 470k)	12p
WR90X	(Hor 0.25W Preset 1M)	12p
WR91Y	(Hor 0.25W Preset 2M2)	12p
WR92A	(Hor 0.25W Preset 4M7)	12p

For Vertical Types

Order		
WW00A	(Vrt 0.25W Preset 100R)	12p
WW01B	(Vrt 0.25W Preset 220R)	12p
WW02C	(Vrt 0.25W Preset 470R)	12p
WW03D	(Vrt 0.25W Preset 1k)	12p
WW04E	(Vrt 0.25W Preset 2k2)	12p
WW05F	(Vrt 0.25W Preset 4k7)	12p
WW06G	(Vrt 0.25W Preset 10k)	12p
WW07H	(Vrt 0.25W Preset 22k)	12p
WW08J	(Vrt 0.25W Preset 47k)	12p
WW09K	(Vrt 0.25W Preset 100k)	12p
WW10L	(Vrt 0.25W Preset 220k)	12p
WW11M	(Vrt 0.25W Preset 470k)	12p
WW12N	(Vrt 0.25W Preset 1M)	12p
WW13P	(Vrt 0.25W Preset 2M2)	12p
WW14Q	(Vrt 0.25W Preset 4M7)	12p

Cermet Preset



A miniature horizontal mounting cermet preset featuring high stability and excellent resolution. It has an integral dust cover, fits 0.1in matrix directly, and may be adjusted by a screwdriver from either side. Linear track only. Tolerance: $\pm 20\%$. Power rating: 0.5W at 50°C. Value is marked on case as shown in brackets below.

The following values are available:

100 Ω (101), 500 Ω (501), 1k (102), 5k (502), 10k (103), 50k (503), 100k (104), 1M (105)

Continued on next page.

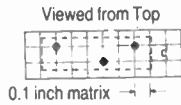
BIG CAT
HIGH POWER
LOUDSPEAKERS
for the BIG sound

Cermet Preset Continued

Order

WR38R (Cermet 100R)	56p
WR39N (Cermet 500R)	56p
WR40T (Cermet 1k)	56p
WR41U (Cermet 5k)	56p
WR42V (Cermet 10k)	56p
WR43W (Cermet 50k)	56p
WR44X (Cermet 100k)	56p
WR45Y (Cermet 1M)	56p

23-Turn Cermet Preset



A 23-turn Cermet preset with slipping clutch, end stops and infinite electrical resolution. 0.75W at 70°C. Max working voltage 315V. Tolerance: ±10%.

Values available:

500Ω, 1k, 5k, 10k, 50k, 100k

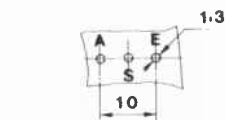
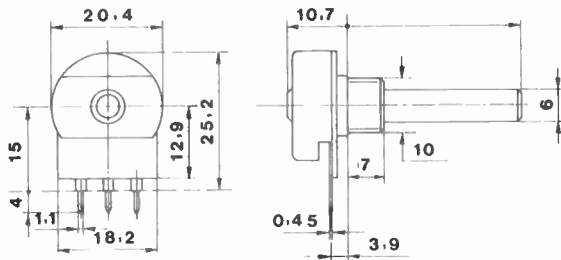
The dust proof and immersion proof case measures 19mm x 4.8mm x 6.4mm high and the terminal pins are at 7.62mm (0.3in) and 5.08mm (0.2in) spacing, the centre pin being offset by 2.54mm (0.1in).

Order

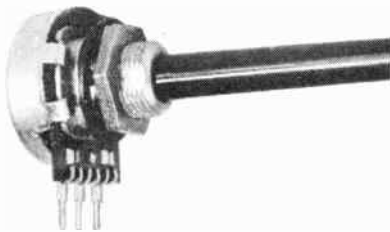
WR46A (23-Turn Cermet 500R)	85p
WR47B (23-Turn Cermet 1k)	85p
WR48C (23-Turn Cermet 5k)	85p
WR49D (23-Turn Cermet 10k)	85p
WR50E (23-Turn Cermet 50k)	85p
WR51F (23-Turn Cermet 100k)	85p

ROTARY POTENTIOMETERS

Single Types



Viewed on component side



A range of carbon track potentiometers with printed circuit board mounting terminals. Fixing hole required: 10.5mm (13/32in.). Power rating: 0.4W linear, 0.2W log. Max. voltage: 500V DC. Tolerance: ±20%.

The following values are available with a linear track:

1k, 4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2

Order

FW00A (Pot Lin 1k)	49p
FW01B (Pot Lin 4k7)	49p
FW02C (Pot Lin 10k)	49p
FW03D (Pot Lin 22k)	49p
FW04E (Pot Lin 47k)	49p
FW05F (Pot Lin 100k)	49p
FW06G (Pot Lin 220k)	49p
FW07H (Pot Lin 470k)	49p
FW08J (Pot Lin 1M)	49p
FW09K (Pot Lin 2M2)	49p

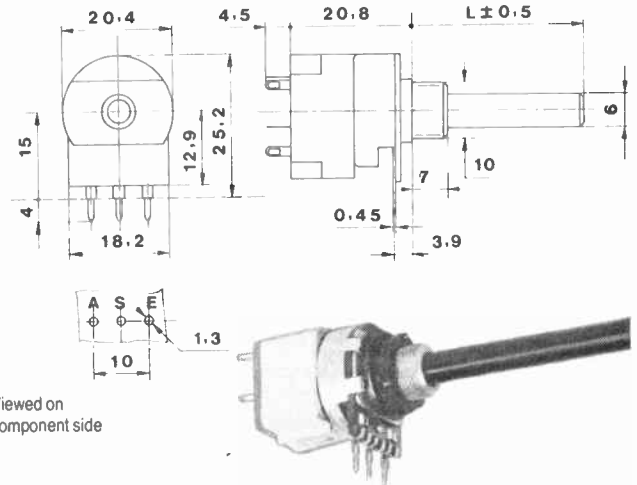
The following types are available with a logarithmic track:

4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2

Order

FW21X (Pot Log 4k7)	49p
FW22Y (Pot Log 10k)	49p
FW23A (Pot Log 22k)	49p
FW24B (Pot Log 47k)	49p
FW25C (Pot Log 100k)	49p
FW26D (Pot Log 220k)	49p
FW27E (Pot Log 470k)	49p
FW28F (Pot Log 1M)	49p
FW29G (Pot Log 2M2)	49p

Single Types With Switch



A range of rotary carbon track potentiometers with DPST switch. The potentiometer has printed circuit mounting terminals. Fixing hole required: 10.5mm (13/32in.). Power rating: 0.4W linear, 0.2W log. Max. voltage: 500V DC. Tolerance: ±20%. Switch rating: 2A at 250V AC.

The following types are available with a linear track:

4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2

Order

FW41U (Sw Pot Lin 4k7)	£1.35
FW42V (Sw Pot Lin 10k)	£1.35
FW43W (Sw Pot Lin 22k)	£1.35
FW44X (Sw Pot Lin 47k)	£1.35
FW45Y (Sw Pot Lin 100k)	£1.35
FW46A (Sw Pot Lin 220k)	£1.35
FW47B (Sw Pot Lin 470k)	£1.35
FW48C (Sw Pot Lin 1M)	£1.35
FW49D (Sw Pot Lin 2M2)	£1.35

The following types are available with a logarithmic track:

4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2

Order

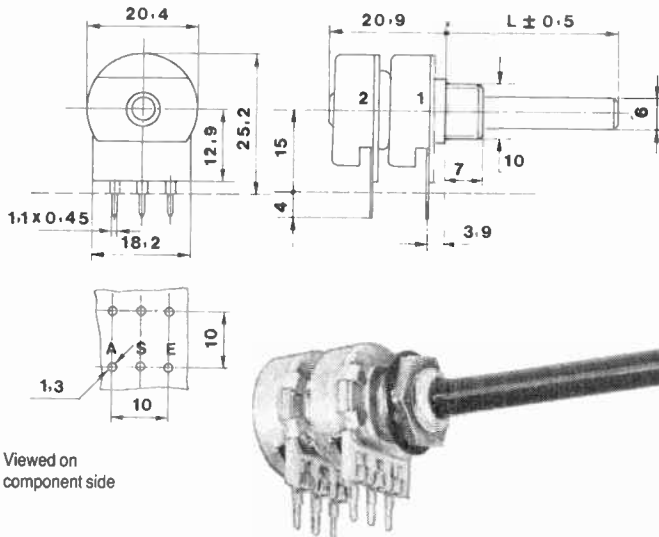
FW62S (Sw Pot Log 4k7)	£1.35
FW63T (Sw Pot Log 10k)	£1.35
FW64U (Sw Pot Log 22k)	£1.35
FW65V (Sw Pot Log 47k)	£1.35
FW66W (Sw Pot Log 100k)	£1.35
FW67X (Sw Pot Log 220k)	£1.35
FW68Y (Sw Pot Log 470k)	£1.35
FW69A (Sw Pot Log 1M)	£1.35
FW70M (Sw Pot Log 2M2)	£1.35

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Phone before 2pm for same day despatch.

Dual-Gang Types



Viewed on component side

A range of rotary dual-gang carbon track potentiometers with printed circuit mounting terminals. Fixing hole required: 10.5mm (13/32in.). Power rating: 0.4W linear, 0.2W log. Max. voltage: 500V DC. Tolerance: ±20%.

The following values are available with a linear track:

4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2

Order

FW84F (Dual Pot Lin 4k7)	£1.45
FW85G (Dual Pot Lin 10k)	£1.45
FW86T (Dual Pot Lin 22k)	£1.45
FW87U (Dual Pot Lin 47k)	£1.45
FW88V (Dual Pot Lin 100k)	£1.45
FW89W (Dual Pot Lin 220k)	£1.45
FW90X (Dual Pot Lin 470k)	£1.45
FW91Y (Dual Pot Lin 1M)	£1.45
FW92A (Dual Pot Lin 2M2)	£1.45

The following types are available with a logarithmic track:

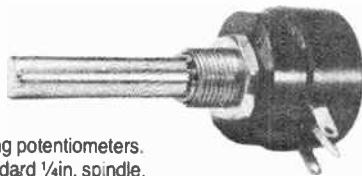
4k7, 10k, 22k, 47k, 100k, 220k, 470k, 1M, 2M2

Order

FX08J (Dual Pot Log 4k7)	£1.45
FX09K (Dual Pot Log 10k)	£1.45
FX10L (Dual Pot Log 22k)	£1.45
FX11M (Dual Pot Log 47k)	£1.45
FX12N (Dual Pot Log 100k)	£1.45
FX13P (Dual Pot Log 220k)	£1.45
FX14Q (Dual Pot Log 470k)	£1.45
FX15R (Dual Pot Log 1M)	£1.45
FX16S (Dual Pot Log 2M2)	£1.45

WIREWOUND POTENTIOMETERS

Front Panel Type



A range of wirewound panel mounting potentiometers. Panel cut-out: 10mm diameter. Standard 1/4in. spindle. Linear track.

Power rating: 1W at 20°C

Tolerance: ±10%

Dimensions of body: 23 x 23mm dia.

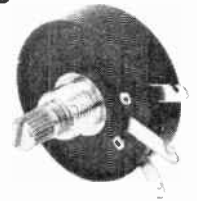
Available in the following values: 50Ω, 100Ω, 250Ω, 500Ω, 1k, 5k, 10k and 50k.

Order

FW52G (W/W Pot 50R)	£2.95
FW71N (W/W Pot 100R)	£2.95
FW72P (W/W Pot 250R)	£2.95
FW73Q (W/W Pot 500R)	£2.95
FW93B (W/W Pot 1k)	£2.95
FW94C (W/W Pot 5k)	£2.95
FW95D (W/W Pot 10k)	£2.95
FX18U (W/W Pot 50k)	£3.50

Loudspeaker Volume Controls

Enclosed wirewound controls with 6.3mm (1/4in.) dia. shaft, 9.5mm long. Standard 3/16in. hole mounting. Ideal for use as a loudspeaker volume control. Available in four values: 20Ω, 50Ω, 100Ω, and 200Ω.

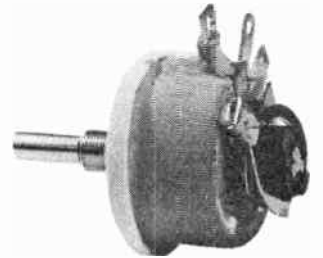


Order

FX40T (L/S Control 20R)	65p
FX97F (L/S Control 50R)	65p
FX98G (L/S Control 100R)	65p
FX99H (L/S Control 200R)	65p

Rheostats

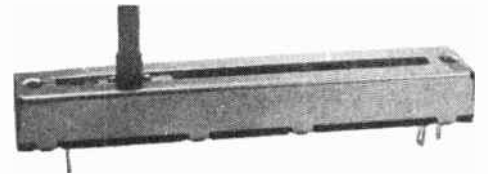
A 25W wirewound power rheostat. Standard 6.35mm (1/4in.) shaft. Panel cut-out 10mm. Bush length 12mm. Shaft length 19mm. Overall diameter 36mm. Overall depth 34mm. Available in the following values: 50Ω, 100Ω, 150Ω and 200Ω.



Order

YG04E (Rheostat 50R)	£5.45
YG05F (Rheostat 100R)	£5.45
YG06G (Rheostat 150R)	£5.45
YG07H (Rheostat 200R)	£5.45

SLIDE POTENTIOMETERS



A range of high quality carbon track slide potentiometers in a metal case which may be used as a screen. The potentiometers have a very smooth movement, low noise and low end-resistance. Single and double track versions are available with linear and logarithmic tracks. For suitable knobs see page 184. The potentiometers are tapped to accept M3 screws (max. depth in pot. 6mm). If you use a countersunk screw the screwhead can be covered by our Slide Bezel FX07H.

The terminals on the potentiometer are marked 1, 2 and 3. Terminal 2 is the slider, terminal 1 is the start of the track and terminal 3 is the end of the track. Even on linear types the best results are obtained if the pot is always used this way round. If the pot is to be used with a high DC voltage always try to arrange for the track ends to be more negative than the slider as this minimises the chance of the track becoming anodised.

Specification

Travel:	60mm
Size:	88 x 12.4mm (single) — 88 x 20mm (dual)
Depth:	11mm (body) plus 7.5mm (tag)
Fixing centres:	80mm x M3 tapped
Cut-out required:	68 x 2mm
Tang length:	15mm
Power rating:	0.5W (lin) — 0.25W (log) at 50°C
Max. voltage:	500V (lin) — 350V (log)
Tolerance:	±20%

Residual resistance between terminals	1 & 2	2 & 3
5k lin to 25k lin	<10Ω	<10Ω
50k lin to 500k lin	<20Ω	<20Ω
5k log to 50k log	<3Ω	<10Ω
100k log	<10Ω	<20Ω
250k log	<20Ω	<20Ω
500k log	<20Ω	<50Ω

Peak noise when slider moving: Better than 52dB at 20V
Track matching (dual types): 2dB (lin), 3dB (log)
Life — Noise increase after 15,000 cycles: <10dB
Marking: Linear: B, Logarithmic: A.
(Note that this is the opposite to most UK markings).

Continued on next page.

Slide Potentiometers Continued

These potentiometers are available in the following values:
Single-gang linear: 5k, 10k, 25k, 50k, 100k, 250k, 500k

Order

FX32K (Slide Pot Lin 5k)	85p
FX33L (Slide Pot Lin 10k)	85p
FX34M (Slide Pot Lin 25k)	85p
FX35Q (Slide Pot Lin 50k)	85p
FX36P (Slide Pot Lin 100k)	85p
FX37S (Slide Pot Lin 250k)	85p
FX38R (Slide Pot Lin 500k)	85p

Single-gang log: 5k, 10k, 25k, 50k, 100k, 250k, 500k

Order

FX53H (Slide Pot Log 5k)	85p
FX54J (Slide Pot Log 10k)	85p
FX55K (Slide Pot Log 25k)	85p
FX56L (Slide Pot Log 50k)	85p
FX57M (Slide Pot Log 100k)	85p
FX58N (Slide Pot Log 250k)	85p
FX59P (Slide Pot Log 500k)	85p

Dual-gang lin: 5k, 10k, 100k

Order

FX76H (Dual Slide Lin 5k)	£1.50
FX77J (Dual Slide Lin 10k)	£1.50
FX80B (Dual Slide Lin 100k)	£1.50

Dual-gang log: 10k, 50k, 100k, 500k

Order

HB02C (Dual Slide Log 10k)	£1.50
HB04E (Dual Slide Log 50k)	£1.50
HB05F (Dual Slide Log 100k)	£1.50
HB07H (Dual Slide Log 500k)	£1.50

Slide Control Bezel

A self-adhesive aluminium bezel to suit our Slide Pots and Dual Slides. Semi-matt anodised finish with black scale on each side of the cut-out.

Bezel overall size: 110 x 30mm.
Cutout required: 65 x 3mm.

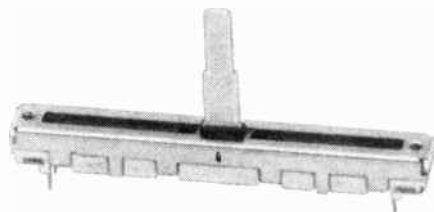


Order

FX07H (Slide Bezel)	48p
---------------------	-----

Miniature Slider Potentiometer

NEW



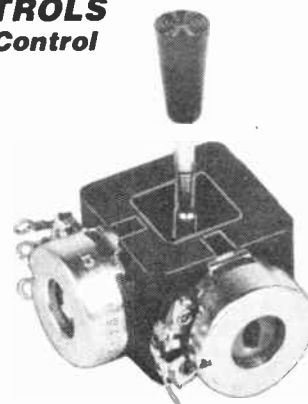
A 20kΩ linear track slider potentiometer measuring only 60mm long x 7.5mm wide with a 45mm track length. It has PCB insertion pins for directly mounting flat to a printed circuit board, to a height of 7.5mm excluding lever. The pin spacing is not compatible with 0.1in. Veroboard. Alternatively it can be attached to a front panel etc., having two M2 size threaded holes at front with fixing centres of 56mm. The 20mm long lever can accept our slider knob YG09K. The lever has a centre click-stop action.

Order

FT68Y (Min Slider 20k Lin)	£1.45
----------------------------	-------

JOYSTICK CONTROLS

Two-Axis Joystick Control

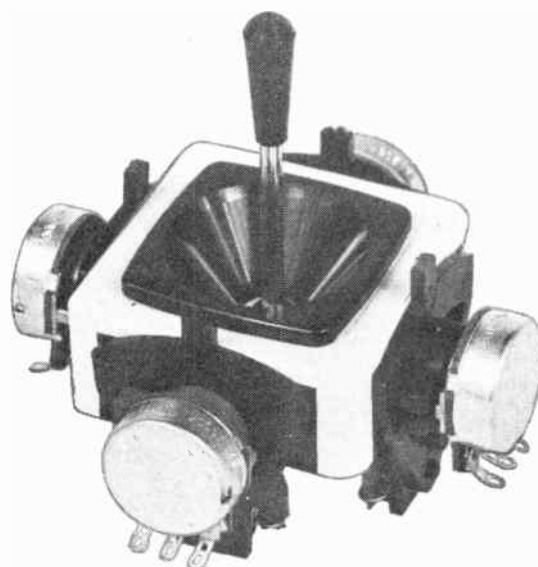


A good quality joystick control designed specially for use with TV games. Fitted with two 220kΩ linear potentiometers.

Order

HQ50E (2-Axis Joystick)	£2.98
-------------------------	-------

Four-Axis Joystick Control

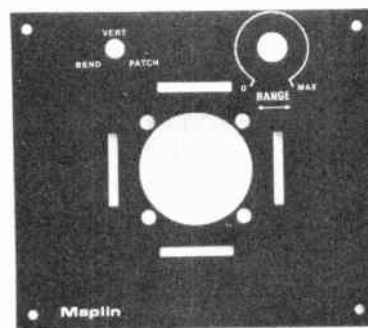


A four axis joystick potentiometer with four 100k linear potentiometers fitted. Lightweight action. Stick will only move potentiometers through 60° (around 20% of total track), but this can be any part of the track. Final adjustments can be carried out after mounting, with the fine trim controls which protrude through the fascia. The joystick is finished with a black plastic bezel and chrome stick with black knob. Overall size (excl. stick) 93 x 93 x 50mm high.

Order

XB09K (Joystick Pot)	£6.95
----------------------	-------

Four-Axis Joystick Mounting Plate



A fully punched aluminium plate for mounting our joystick pot. Finished in semi-matt black. Plate was originally designed for use with our 5600 synthesiser and for that reason has two additional holes; these however could be blanked off. Overall size: 124 x 110mm. Fixing holes: 111 x 97.5 x 6BA clear.

Order

XB06G (Joystick Mtg Plate)	£1.80
----------------------------	-------

THERMISTORS

A range of negative temperature coefficient thermistors. The resistance R_{T_1} of a thermistor at a temperature T_1 °K can be found by inserting the resistance R_{T_2} at a given temperature T_2 °K in the following equation:

$$R_{T_1} = R_{T_2} \cdot e^{\left(\frac{B}{T_1} - \frac{B}{T_2}\right)} \quad \text{or} \quad \log_{10} R_{T_2} + B \left(\frac{T_2 - T_1}{T_1 \cdot T_2}\right) \log_{10} e$$

where B is the characteristic temperature for any given thermistor in °K and e is the exponential factor (= 2.7183). °K = °C + 273.

Disc Thermistor

Disc type lacquer coated thermistor suitable for use in temperature measurement, control and compensation applications.



Diameter:	10mm (max.)		
Power (max):	1W at $T_{amb} = 25^\circ\text{C}$		
Dissipation factor:	5.5mW/°C		
Max. operating temperature:	125°C		
R at 25°C (±20%)	B(°K)	R at 125°C (approx)	Equivalent
1500Ω	4100	48Ω	VA1038

Order

FX87U (Thermistor KR152CW) £1.20

Rod Thermistors

Rod type thermistors for general applications including temperature measurement and circuit compensation.



Length:	12mm (max)			
Diameter:	3.7mm (max)			
Power (max):	0.6W			
Dissipation factor:	5.5mW/°C			
Max operating temperature:	150°C			
Type	R at 25°C (±20%)	B(°K)	R at 150°C (approx)	Colour code
VA1066S	4700Ω	3250	200Ω	Orange
VA1055S	15,000Ω	3550	440Ω	Green
VA1056S	47,000Ω	3925	940Ω	Blue
VA1067S	150,000Ω	4075	2500Ω	White

Order

FX21X (Thermistor VA1055S) 72p
FX22Y (Thermistor VA1056S) 68p
FX42V (Thermistor VA1066S) 72p
FX43W (Thermistor VA1067S) 78p

Bead Thermistor Type R53



Directly heated bead type thermistor housed in evacuated glass bulb, designed for operation at a very low power levels owing to its exceptionally high sensitivity and is thus particularly suitable for use in transistor circuits.

Length:	25.4mm (max)
Diameter:	4mm (approx)
Power at 20°C max:	3mW
Power sensitivity:	62.5°C/mW
Dissipation factor:	0.016mW/°C
Max. operating temperature:	175°C (ambient), 220°C (bead)
R at 20°C (±20%):	5000Ω
R at 25°C (±20%):	4200Ω
B (°K):	3100

Typical resistance at 3mW dissipation in free air at 20°C: 63Ω.

Order

FX62S (Thermistor R53) £6.95

Types GL16 and GL23



Directly heated bead type thermistor embedded in a solid glass pellet, suitable for temperature measurement, control and compensation.

Type:	GL16	GL23
Size:	10 x 2.5mm dia	10 x 2.5mm dia
Power at 20°C max:	370mW	140mW
Power sensitivity:	0.5°C/mW	0.5°C/mW
Dissipation factor:	1.3mW/°C	1.3mW/°C
Max operating temperature:	300°C	125°C
R at 20°C (±20%):	1MΩ	2kΩ
R at temp shown (±20%):	30kΩ at 100°C	1.65kΩ at 25°C
B(°K):	4850	3125
Min operating resistance:	170Ω	115Ω

Order

WH23A (Thermistor GL16) £5.95
WH24B (Thermistor GL23) £6.95

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QB01B AC126	Trans	1 297 40p	QQ18U BC559	Trans	4 298 17p	QF69A BZX61C47	Zener	17 302 17p
QB02C AC127	Trans	1 297 40p	QB74R BC650	Trans	4 298 35p	QF69A BZX61C47	Zener	17 302 17p
QB03D AC128	Trans	1 297 45p	QF00A BCY70	Trans	4 298 20p	QF70M BZX61C51	Zener	17 302 17p
QB04E AC141	Trans	1 297 40p	QF01B BCY71	Trans	4 298 20p	QF71N BZX61C56	Zener	17 302 17p
QB05F AC142	Trans	1 297 45p	QF03D BD131	Trans	6 299 74p	QF72P BZX61C62	Zener	17 302 17p
QB06G AC176	Trans	1 297 40p	QF04E BD131 2MP	Trans	6 299 £1 65	QF73Q BZX61C68	Zener	17 302 16p
QB07H AC187	Trans	1 297 40p	QF05F BD132	Trans	6 299 74p	QF74R BZX61C75	Zener	17 302 16p
QB08J AC188	Trans	1 297 40p	QF06G BD135	Trans	6 299 50p	QH00A BZY88C2V7	Zener	17 302 9p
QB10L ACY19	Trans	1 297 86p	QF75S BD136	Trans	6 299 45p	QH01B BZY88C3V0	Zener	17 302 9p
BL31J AD149	Trans	3 298 £1.50	QF07H BD139	Trans	6 299 45p	QH02C BZY88C3V3	Zener	17 302 9p
BL32K AD161	Trans	3 298 80p	QF08J BD140	Trans	6 299 45p	QH03D BZY88C3V6	Zener	17 302 9p
BL33L AD161 2MP	Trans	3 298 £1.70	WH15R BD711	Trans	6 299 68p	QH04E BZY88C3V9	Zener	17 302 9p
BL34M AD162	Trans	3 298 50p	WH16S BD712	Trans	6 299 86p	QH05F BZY88C4V3	Zener	17 302 9p
QQ00A ADC0804LCN A D	-	375 £4.40	QF09K BF115	Trans	7 300 51p	QH06G BZY88C4V7	Zener	17 302 9p
UF44X ADC0820CCN A D	-	375 £19.95	QF10L BF167	Trans	7 300 40p	QH07H BZY88C5V1	Zener	17 302 9p
UF45Y ADC0829CCN A D	-	375 £14.95	QY53H BF173	Trans	7 300 40p	QH08J BZY88C5V6	Zener	17 302 9p
UF46A ADC0831CCN A D	-	376 £3.95	QF11M BF180	Trans	7 300 45p	QH09K BZY88C6V2	Zener	17 302 9p
UF48C ADC0844CCN A D	-	376 £5.95	QF15R BF200	Trans	7 300 90p	QH10L BZY88C6V8	Zener	17 302 9p
QB19V AF139	Trans	2 297 54p	QF16S BF244	FET	9 300 85p	QH11M BZY88C7V5	Zener	17 302 8p
QB20W AF239	Trans	2 297 63p	QF17T BF258	Trans	8 300 36p	QH12N BZY88C8V2	Zener	17 302 9p
YH93B AM7910	Modem	-	QF18U BF259	Trans	8 300 45p	QH13P BZY88C9V1	Zener	17 302 9p
HQ51F AY-1-5050	Divider	-	QF19V BF337	Trans	8 300 40p	QH14Q BZY88C10	Zener	17 302 9p
YY89W AY-3-1350	Synth	-	QQ19V BF494	Trans	7 300 45p	QH15R BZY88C11	Zener	17 302 9p
WQ18U AY-3-1015D	UART	-	QQ20W BF495	Trans	7 300 45p	QH16S BZY88C12	Zener	17 302 9p
RA89W AY-3-8910	Sound Gen	-	QF177 BF258	Trans	9 300 £1 65	QH17T BZY88C13	Zener	17 302 9p
RA90X AY-3-8912	Sound Gen	-	QF21X BFX29	Trans	5 299 40p	QH18U BZY88C15	Zener	17 302 9p
RA91Y AY-3-8913	Sound Gen	-	QF22Y BFX30	Trans	5 299 40p	QH19V BZY88C16	Zener	17 302 9p
QQ13P BAR28	Diode	13 301 28p	QF23A BFX84	Trans	5 299 40p	QH20W BZY88C18	Zener	17 302 9p
QB28F BAX13	Diode	13 301 10p	QF24B BFX85	Trans	5 299 40p	QH21X BZY88C20	Zener	17 302 9p
QB29G BAX16	Diode	13 300 10p	QF25C BFX87	Trans	5 299 40p	QH22Y BZY88C22	Zener	17 302 9p
YH83E BB212	Varicap	14 301 £2.95	QF26D BFX88	Trans	5 299 40p	QH23A BZY88C24	Zener	17 302 9p
QB31J BC107B	Trans	4 298 16p	QF27E BFX50	Trans	5 299 36p	QH24B BZY88C27	Zener	17 302 9p
QB32K BC108C	Trans	4 298 16p	QF28F BFX51	Trans	5 299 36p	QH25C BZY88C30	Zener	17 302 9p
QB33L BC109C	Trans	4 298 16p	QF29G BFX52	Trans	5 299 36p	QH26D CA3046	Array	- 349 75p
QB34M BC117	Trans	4 298 28p	QQ64U BFY90	Trans	7 300 92p	YH58N CA3080E	Op-Amp	- 332 98p
QB35Q BC119	Trans	5 299 39p	QF31J BRY39	PUT	12 301 75p	QH28F CA3130E	Op-Amp	- 330 97p
QB36P BC139	Trans	5 299 46p	QF32K BSX20	Trans	7 300 34p	QH29G CA3140E	Op-Amp	- 330 54p
QB37S BC140	Trans	5 299 43p	QF35Q BT109	Thy	18 302 £1 95	WQ20W CA3189E	FM IF	- 346 £2 98
QB38R BC141	Trans	5 299 46p	YH94C BT149F	Thy	18 302 48p	WQ21X CA3240E	Op-Amp	- 330 £1.54
QB39N BC142	Trans	5 299 46p	YH95D BT149M	Thy	18 302 65p	YG37S CL8960	Radar	- 353 £39.95
QB40T BC143	Trans	5 299 43p	QF37S BU205	Trans	8 300 £2 95	QH30H C106D	Thy	18 302 42p
QB48C BC160	Trans	5 299 46p	QF39N BU208	Trans	8 300 £2.50	WQ22Y C116D	Thy	18 302 69p
QB49D BC161	Trans	5 299 46p	QF41U BY126	Rect	15 301 16p	WQ23A C126D	Thy	18 302 98p
QB50E BC168C	Trans	4 298 14p	QF42V BY127	Rect	15 301 13p	WQ24B C206D	Triac	19 302 64p
QB51F BC169C	Trans	4 298 14p	QF43W BY164	Bridge	16 302 75p	WQ25C C226D	Triac	19 302 79p
QB52G BC177	Trans	4 298 20p	QF44X BY206	Diode	13 301 24p	QL14Q C246D	Triac	19 302 £1 20
QB53H BC178	Trans	4 298 20p	QF45Y BZX61C4V7	Zener	17 302 17p	QQ01B DAC0801LCN	D A	- 376 £3.95
QB54J BC179	Trans	4 298 25p	QF46A BZX61C5V1	Zener	17 302 17p	UF47B DAC0832LCN	D A	- 377 £3.95
QB55K BC182L	Trans	4 298 11p	QF47B BZX61C5V6	Zener	17 302 17p	WQ28F HSCH1001	Diode	13 301 55p
QB56L BC183L	Trans	4 298 11p	QF48C BZX61C6V2	Zener	17 302 17p	YH59P ICL7109	A D	- 378 £21 95
QB57M BC184L	Trans	4 298 11p	QF49D BZX61C6V8	Zener	17 302 17p	YY75S ICL7660CPA	V Converter	- 361 £2.85
QB58N BC204	Trans	4 298 16p	QF50E BZX61C7V5	Zener	17 302 17p	YY93B ICM7045PI	Stopwatch	- 354 £16.95
QB59P BC209C	Trans	4 298 35p	QF51F BZX61C8V2	Zener	17 302 17p	Y994C ICM7216DPI	Counter	- 355 £25.95
QB60Q BC212L	Trans	4 298 12p	QF52G BZX61C9V1	Zener	17 302 17p	YH63T ICM 7555	Timer	- 357 98p
QB61R BC213L	Trans	4 298 11p	QF53H BZX61C10	Zener	17 302 17p	BH45Y J005	Bridge	16 302 £1.75
QB62S BC214L	Trans	4 298 12p	QF54J BZX61C11	Zener	17 302 17p	BL36P J02	Bridge	16 302 £3.40
QB63T BC301 5	Trans	5 299 40p	QF55K BZX61C12	Zener	17 302 17p	BH46A J04	Bridge	16 302 £2.95
QB65V BC303 5	Trans	5 299 40p	QF56L BZX61C13	Zener	17 302 17p	RA60Q KB3600	Keyboard	- 368 £6.95
QB66W BC327	Trans	5 299 17p	QF57M BZX61C15	Zener	17 302 17p	BH47B K01	Bridge	16 302 £3.45
QB67X BC328	Trans	5 299 15p	QF58N BZX61C16	Zener	17 302 17p	BH48C K04	Bridge	16 302 £4.95
QB68Y BC337	Trans	5 299 17p	QF59P BZX61C18	Zener	17 302 17p	YY74F L200	Regulator	- 362 £1.75
QB69A BC338	Trans	5 299 17p	QF60Q BZX61C20	Zener	17 302 17p	WQ29G LF347	Op-Amp	- 331 £1.35
QB70M BC441	Trans	5 299 39p	QF61R BZX61C22	Zener	17 302 17p	WQ30H LF351	Op-Amp	- 331 46p
QB71N BC441 461MP	Trans	5 299 £1.35	QF62S BZX61C24	Zener	17 302 17p	WQ31J LF353	Op-Amp	- 331 79p
QB72P BC461	Trans	5 299 39p	QF63T BZX61C27	Zener	17 302 17p	QY27E LF411CN	Op-Amp	- 331 £1.45
QQ14Q BC547	Trans	4 298 14p	QF64U BZX61C30	Zener	17 302 17p	QY28F LF412CN	Op-Amp	- 331 £2.75
QB73Q BC548	Trans	4 298 14p	QF65V BZX61C33	Zener	17 302 17p	QY29G LF441CN	Op-Amp	- 331 £1.25
QQ15R BC549	Trans	4 298 17p	QF66W BZX61C36	Zener	17 302 17p	QY30H LF442CN	Op-Amp	- 331 £1 95
QQ16S BC557	Trans	4 298 17p	QF67X BZX61C39	Zener	17 302 17p	QY31J LF444CN	Op-Amp	- 331 £3 25

Order	Device	Type	Table	Page	Price	Order As Device	Type	Table	Page	Price	Order As Device	Type	Table	Page	Price		
YY69A	LF13741	Op-Amp	-	331	95p	QH74R	OA200	Diode	13	301	9p	WQ89W	uA79M12UC	Regulator	-	363	70p
QH35Q	LH0042C	Op-Amp	-	331	£8.95	QH75S	OA202	Diode	13	301	9p	WQ90X	uA79M15UC	Regulator	-	363	70p
RA79L	LMC835	Graphic Eq	-	339	£19.95	QH82D	OC45	Trans	2	297	72p	WQ91Y	uA79MGU1C	Regulator	-	363	£1.20
UF51F	LM35CZ	Temperature	-	353	£4.95	QH84F	OC71	Trans	1	297	54p	WQ92A	uA79O5UC	Regulator	-	363	70p
UF52G	LM35DZ	Temperature	-	353	£2.95	QH87U	OC81	Trans	1	297	78p	WQ93B	uA7912UC	Regulator	-	363	70p
QH36P	LM301A	Op-Amp	-	328	54p	RA73Q	OP-07C	Op-Amp	-	329	£2.20	QL36E	uA7915UC	Regulator	-	363	70p
QH37S	LM308	Op-Amp	-	328	86p	RA74R	OP-27G	Op-Amp	-	329	£6.50	WQ94C	uA79M15UC	Regulator	-	363	£1.45
QY09K	LM311N	Comparator	-	332	51p	QY37S	PC1R	Pwr Cntl	-	365	£3.95	QY77J	UCN5801A	Driver	-	369	£7.95
RA87U	LM317L	Regulator	-	363	78p	QY38R	PC12R	Pwr Cntl	-	365	£7.95	QY78K	ULN2801A	Driver	-	369	£1.95
RA86T	LM317M	Regulator	-	363	86p	QH93B	PN3643	Trans	4	298	28p	QY79L	ULN2803A	Driver	-	369	£2.15
UF27E	LM317T	Regulator	-	363	85p	WQ57M	PW01	Bridge	16	302	£1.10	QQ27E	VN1010	VMOS	10	300	80p
UF26D	LM324	Op-Amp	-	328	50p	WQ58N	PW06	Bridge	16	302	£1.80	QQ28F	VN1010	VMOS	10	300	£1.80
WQ32K	LM334	Regulator	-	360	£1.30	RA82D	REF-01C	V Ref	-	360	£4.95	WQ96E	VN46AF	VMOS	10	300	£1.95
YY73Q	LM335Z	Temperature	-	353	£1.65	RA83E	REF-02C	V Ref	-	360	£4.50	WQ97F	VN66AF	VMOS	10	300	£2.40
RA88V	LM338K	Regulator	-	363	£7.95	RA84F	REF-03C	V Ref	-	360	£2.45	WQ98G	VN88AF	VMOS	10	300	£2.65
QH38R	LM377	Power-Amp	-	334	£2.98	QL00A	R2008B	Trans	8	300	£2.20	QQ11M	VQ1000CJ	VMOS	-	349	£6.95
QH40T	LM380	Power-Amp	-	335	£1.09	QY76H	SAA1027	Stepper	-	352	£3.75	QL37S	W005	Bridge	16	302	32p
QH41U	LM381	Pre-Amp	-	337	£2.50	RA81C	SAA1099	Music Gen	-	345	£5.95	QL38R	W001	Bridge	16	302	32p
YY84F	LM382	Pre-Amp	-	337	£1.49	QY71N	SA40A	Supprsr	17a	302	£1.58	QL39N	W02	Bridge	16	302	35p
WQ33L	LM383	Power-Amp	-	336	£2.95	QL02C	SAM77	Divider	-	208	98p	QL40T	W04	Bridge	16	302	38p
WQ34M	LM384	Power-Amp	-	335	£2.95	QL05F	SC146D	Trnc	19	302	£1.95	QY43W	XR2211CP	Modem	-	374	£2.95
WQ35Q	LM387	Pre-Amp	-	337	£1.88	QL06G	SG1495D	Multiplier	-	348	£6.95	QL41U	ZN414	AM Radio	-	348	£1.20
WQ36P	LM389	Power-Amp	-	333	£1.32	WQ61R	SH120A	TV Amp	-	346	£7.95	QY61R	ZN415E	AM Radio	-	348	£1.40
RA77J	LM592	Op-Amp	-	328	£1.40	RA93B	Si520	A D	-	376	£12.95	YH29A	ZN419/409CE	Servo	-	351	£1.80
RA78K	LM631	Power Amp	-	334	£3.65	YH66W	SL490	Xmitter	-	350	£3.45	UF38R	ZN425E-8	D/A-A/D	-	377	£3.95
UF49D	LM833N	Op-Amp	-	328	£1.65	QY50E	SP0256	Voice	-	345	£7.95	UF39N	ZN426E-8	D/A	-	377	£2.95
QY19V	LM1035	Vol Control	-	338	£4.45	QY18U	SP6880B	Divider	-	356	£12.95	UF40T	ZN427E-8	A/D	-	377	£9.95
QY33L	LM1037N	DC Switch	-	338	£3.95	QL08J	ST2	Diac	20	302	28p	UF41U	ZN428E-8	D/A	-	377	£6.95
YY85G	LM1818	Tape Deck	-	340	£1.95	QL09K	S005	Bridge	16	302	52p	UF42V	ZN435E	D/A-A/D	-	377	£6.50
YY99H	LM1830	Fluid Det	-	353	£2.98	QL10L	S04	Bridge	16	302	58p	UF43W	ZN448E	A/D	-	377	£8.95
QY36P	LM1851N	Ground Fault	-	359	£2.45	QL13P	TBA810P	Power Amp	-	335	£1.45	UF32K	ZN1034E	Timer	-	357	£2.30
YY71N	LM1871	Xmitter	-	351	£3.45	WQ67T	TBA820M	Power Amp	-	334	74p	QL42V	ZS120	Diode	13	301	45p
YY72P	LM1872	Receiver	-	351	£3.45	YH79L	TCA350Z	Bucket	-	343	£3.95	QL43W	ZTX107	Trans	4	298	18p
UF50E	LM1893N	Transceiver	-	352	£14.95	WQ64U	TCA4500A	Decoder	-	347	£3.45	QL44X	ZTX108	Trans	4	298	14p
QH39N	LM2879	Power Amp	-	335	£7.95	WH20W	TDA1022	Bucket	-	343	£4.50	QL45Y	ZTX109	Trans	4	298	20p
WQ38R	LM2917	F to V	-	378	£3.45	YY76H	TDA1024	0V Switch	-	358	£1.26	QL46A	ZTX300	Trans	4	298	20p
RA94C	LM2984	Power Sply	-	362	NYA	RA80B	TDA1097	Bucket	-	343	£6.95	QL48C	ZTX302	Trans	4	298	24p
WQ37S	LM3820	AM IF	-	346	£1.85	TDA2002A	see LM383	see LM383	-	336		QL50E	ZTX304	Trans	4	298	22p
QH42V	LM3900	Op-Amp	-	330	80p	YY70M	TDA2005M	Power Amp	-	336	£4.95	QL60Q	ZTX500	Trans	4	298	18p
WQ39N	LM3909	Flasher	-	358	£1.09	WQ66W	TDA2006	Power Amp	-	336	£2.95	QL62S	ZTX502	Trans	4	298	17p
WQ40T	LM3911	Thermometer	-	353	£1.98	WQ67X	TDA2030	Power Amp	-	336	£2.15	QL64U	ZTX504	Trans	4	298	28p
WQ41U	LM3914	Bargraph	-	354	£3.45	YY86T	TDA3410	Pre-Amp	-	337	£2.20	QL68Y	ZTX541	Trans	4	298	24p
YY96E	LM3915	Bargraph	-	354	£3.95	YH87U	TDA7000	Radio	-	349	£2.45	QL69A	ZTX542	Trans	4	298	28p
YY97F	LM3916	Bargraph	-	354	£3.45	YH91Y	TEA1058	Dimmer	-	359	£3.95	QL70M	Z5J	Noise Gen	21	302	£4.95
YH64U	LM13700N	Op-Amp	-	332	£1.95	QL15R	TIP31A	Trans	6	299	43p	QW00A	Z80-CPU	MPU	-	367	£2.98
QH45Y	MC1310P	Decoder	-	347	£1.98	QL16S	TIP32A	Trans	6	299	49p	UF35Q	Z80A-DART	UART	-	367	£8.95
YH89W	MC1488N	RS232	-	368	£1.15	WQ71N	TIP33A	Trans	6	299	80p	QW03D	Z80-PIO	PIO	-	367	£3.63
YH90X	MC1489N	RS232	-	369	£1.15	WQ72P	TIP34A	Trans	6	299	95p	QL71N	1N914	Diode	13	301	4p
QH47B	MC1496	Modulator	-	348	£1.35	QL17T	TIP41A	Trans	6	299	57p	QL72P	1N916	Diode	13	301	5p
QH48C	MC3302P	Comparator	-	332	86p	QL18U	TIP42A	Trans	6	299	62p	QL73Q	1N4001	Rect	15	301	5p
QH49D	MC3340P	Attenuator	-	340	£2.45	WQ73Q	TIP122	Darlington	6	299	84p	QL74R	1N4002	Rect	15	301	5p
WQ42V	MCM4027	RAM	-	370	£2.45	WQ74R	TIP127	Darlington	6	299	95p	QL75S	1N4003	Rect	15	301	6p
WQ44X	MC6802P	MPU	-	366	£4.95	HH55K	TIP295S	Trans	6	299	80p	QL76H	1N4004	Rect	15	301	6p
WQ45Y	MC6810AP	RAM	-	370	£2.95	QH56L	TIP305S	Trans	6	299	80p	QL77J	1N4005	Rect	15	301	6p
WQ46A	MC6821P	PIA	-	366	£2.95	QL19V	TIS43	Unijunction	11	300	57p	QL78K	1N4006	Rect	15	301	7p
QQ03D	MC6845	CRT	-	370	£6.95	RA75S	TLC251C	Op-Amp	-	331	£1.85	QL79L	1N4007	Rect	15	301	7p
WQ48C	MC6850P	ACIA	-	366	£2.45	RA76H	TLC555C	Timer	-	357	65p	QL80B	1N4148	Diode	13	301	4p
QY23A	MC10116P	RF Amp	-	347	£1.45	RA66W	TL064C	Op-Amp	-	331	£1.09	QL81C	1N5400	Rect	15	301	14p
QY35Q	MF10CN	Filter	-	340	£3.45	RA67X	TL071C	Op-Amp	-	331	46p	QL82D	1N5401	Rect	15	301	14p
QH54J	MJE340	Trans	6	299	62p	RA68Y	TL072C	Op-Amp	-	331	68p	QL83E	1N5402	Rect	15	301	16p
WQ51F	MJE350	Trans	6	299	£1.20	RA69A	TL074C	Op-Amp	-	331	£1.25	QL84F	1N5404	Rect	15	301	18p
QH57M	MJ2501	Darlington	6	299	£2.25	RA70M	TL081C	Op-Amp	-	331	34p	QL85G	1N5406	Rect	15	301	19p
BL38R	MJ2955	Trans	6	299	£1.12	RA71N	TL082C	Op-Amp	-	331	57p	QL86T	1N5407	Rect	15	301	20p
QH58N	MJ3001	Darlington	6	299	£2.80	RA72P	TL084C	Op-Amp	-	331	£1.15	QL87U	1N5408	Rect	15	301	22p
YH67X	ML922	Receiver	-	350	£5.95	WQ75S	TL170C	Hall Effect	-	352	£1.10	QL88V	1S921	Diode	13	301	10p
QR57M	ML926	Receiver	-	350	£4.75	WQ75H	TL172C	Hall Effect	-	352	£1.45	QH46A	1458C	Op-Amp	-	329	40p
QR58N	ML927	Receiver	-	350	£2.45	YY77J	TL430C	Adj Zener	-	360	£1.30	QR00A	2N697	Trans	5	299	36p
YH68Y	ML928	Receiver	-	350	£5.95	RA85G	TL494C	Power Sply	-	361	£1.95	QR01B	2N706	Trans	4	298	28p
YH69A	ML929	Receiver	-	350	£5.95	YY78K	TL497A	Switching Reg	-	360	£1.95	QR09K	2N1711	Trans	5	299	32p
QH59P	MFP102	FET	9	300	78p	YY88V	TMS1121	Timer	-	355	£5.95	QR10L	2N1893	Trans	5	299	70p
QH60Q	MPSA14	Darlington	4	298	28p	QY14Q	UAA170L	Bargraph	-	354	£4.45	QR11M	2N2219	Trans	5	299	32p
QH61R	MPSA65	Darlington	4	298	28p	QL24B	uA709C	Op-Amp	-	329	40p	QR12N	2N2369A	Trans	7	300	20p
QH62S	MPS3638	Trans	4	298	60p	BL22Y	uA723C TO99	Regulator	-	362	98p	QR14Q	2N2646	Unijunction	11	300	70p
QH63T	MPS3638A	Trans	4	298	65p	QL21X	uA723C 14-pin	Regulator	-	362	65p	QR17T	2N2905	Trans	5	299	32p
YH96E	MR751	Rect	15	301	58p	QL22Y	uA741C 8-pin	Op-Amp	-	329	25p	QR18U	2N2906	Trans	4	298	32p
YH97F	MR754	Rect	15	301	95p	QL23A	uA741C 14-pin	Op-Amp	-	329	55p	QR19V	2N2907	Trans	4	298	32p
WQ53H	MVAM115	Varicap	14	301	£3.25	QL24B	uA747C	Op-Amp	-	329	69p	QR20W	2N2926Or	Trans	4	298	11p
QY81C	MV2108	Varicap	14	301	78p	QL25C	uA748C	Op-Amp	-	329	40p	QR21Y	2N2926Ye	Trans	4	298	11p
UF29G	MVS460-2	Zener	-	361	95p	QL26D	uA78L05AWC	Regulator	-	363	34p	QR22X	2N2926Gn	Trans	4	298	11p
YH81C	M083	Organ	-	341	£4.45	WQ77J	uA78L12AWC	Regulator	-	363	34p	QR23A	2N3053	Trans	5	299	35p
YY90X	M108	Organ															

Order	Device	Type	Table	Page	Price	Order As	Device	Type	Table	Page	Price	Order As	Device	Type	Table	Page	Price
QR46A	2N4062	Trans	4	298	17p	QW62S	40104BE	CMOS	-	315	£1.38	QX78K	7416	TTL	-	310	40p
QR47B	2N4871	Unijunction	11	300	£1.30	QW63T	40105BE	CMOS	-	316	£2.52	QX79L	7417	TTL	-	310	40p
QR49D	2N5458	FET	9	300	49p	QW64U	40106BE	CMOS	-	309	46p	QX47B	7420	TTL	-	305	28p
QR50E	2N5459	FET	9	300	60p	QW65V	40107BE	CMOS	-	312	63p	UB11M	74HC20	HC	-	305	62p
QR51F	2N6073	Trnac	19	302	£1.10	QW66W	40108BE	CMOS	-	314	£3.50	YF14Q	74LS20	TTL	-	305	28p
QW08J	2N6609	Trans	6	299	£3.95	QW67X	40109BE	CMOS	-	310	£1.15	QX48C	7421	TTL	-	306	57p
QR56L	2SA715	Trans	6	299	85p	QW68Y	40110BE	CMOS	-	318	£2.70	UB12N	74HC21	HC	-	306	62p
QQ30H	2SA872	Trans	4	298	48p	QW70M	40161BE	CMOS	-	317	£2.20	YF15R	74LS21	TTL	-	306	28p
QY12N	2SA1085E	Trans	4	298	45p	QW73Q	40174BE	CMOS	-	312	86p	YF16S	74LS22	TTL	-	305	28p
QQ31J	2SB716	Trans	4	299	35p	QW74R	40181BE	CMOS	-	325	£2.52	QX80B	7425	TTL	-	307	40p
QR59P	2SC1162	Trans	6	299	51p	QW75S	40182BE	CMOS	-	325	92p	QX81C	7426	TTL	-	305	46p
QQ32K	2SC1307	Trans	8	300	£2.20	QW78K	40194BE	CMOS	-	315	80p	YF17T	74LS26	TTL	-	305	28p
QY11M	2SC2547E	Trans	4	298	46p	QW79L	40257BE	CMOS	-	321	£2.25	QX49D	7427	TTL	-	307	40p
QQ33L	2SD756	Trans	5	299	35p	QX34M	40673	FET	9	300	£2.20	UB13P	74HC27	HC	-	307	62p
QQ34M	2SJ48	VMOS	10	300	£4.95	QW93B	4116	RAM	-	371	£1.15	YF18U	74LS27	TTL	-	307	28p
QQ35Q	2SJ49	VMOS	10	300	£5.15	QQ05F	4118	RAM	-	370	£5.95	YF19V	74LS28	TTL	-	307	28p
QW09K	2SJ50	VMOS	10	300	£5.95	CY74R	41256	RAM	-	371	£6.95	QX50E	7430	TTL	-	306	28p
QQ36P	2SK133	VMOS	10	300	£5.25	XX01B	4136	Op-Amp	-	329	98p	UB14Q	74HC30	HC	-	306	62p
QQ37S	2SK134	VMOS	10	300	£5.45	QW80B	4151	V to F	-	374	£1.15	YF20W	74LS30	TTL	-	306	28p
QW10L	2SK135	VMOS	10	300	£5.75	QQ06G	4164	RAM	-	371	£2.30	QX51F	7432	TTL	-	307	34p
QW12N	2114	RAM	-	370	£2.95	XX02C	4195	Regulator	-	361	£1.80	UB15R	74HC32	HC	-	307	62p
QW13P	2708	EPROM	-	371	£7.95	QQ39N	4412VP	CMOS	-	327	£9.25	YF21X	74LS32	TTL	-	307	28p
QQ07H	2716	EPROM	-	371	£3.45	QX30H	4416BE	CMOS	-	323	£2.95	YF22Y	74LS33	TTL	-	307	28p
QQ08J	2732	EPROM	-	371	£3.95	QY55K	4419BE	CMOS	-	318	£3.98	YF23A	74LS37	TTL	-	305	28p
QQ09K	2764	EPROM	-	371	£5.95	QW81C	4502BE	CMOS	-	310	57p	QX82D	7438	TTL	-	305	46p
YH88V	27128	EPROM	-	372	£7.95	QQ41U	4503BE	CMOS	-	310	51p	YF24B	74LS38	TTL	-	305	28p
QY75S	27256	EPROM	-	372	£14.90	QW82D	4508BE	CMOS	-	314	£1.32	YF25C	74LS40	TTL	-	305	28p
QR52G	3N140	FET	9	300	£2.40	QW83E	4510BE	CMOS	-	317	57p	QX54J	7442	TTL	-	319	74p
QH51F	3403	Op-Amp	-	329	95p	QX31J	4511BE	CMOS	-	320	57p	UB17T	74HC42	HC	-	319	£1.55
QX00A	4000UBE	CMOS	-	307	23p	QW84F	4512BE	CMOS	-	321	57p	YF26D	74LS42	TTL	-	319	57p
QX01B	4001BE	CMOS	-	307	23p	QW85G	4514BE	CMOS	-	320	£1.32	QX55K	7447A	TTL	-	320	£1.09
QL03D	4001UBE	CMOS	-	307	23p	QW86T	4515BE	CMOS	-	320	£1.32	QQ52G	74LS47	TTL	-	320	92p
QX02C	4002BE	CMOS	-	307	23p	QW87U	4516BE	CMOS	-	317	57p	QQ53H	74LS48	TTL	-	320	£1.03
QX03D	4006BE	CMOS	-	316	80p	QX32K	4518BE	CMOS	-	317	57p	YF27E	74LS51	TTL	-	308	28p
QX04E	4007UBE	CMOS	-	311	23p	QX33L	4520BE	CMOS	-	317	57p	YF28F	74LS54	TTL	-	308	28p
QW14Q	4008BE	CMOS	-	324	69p	QQ44X	4526BE	CMOS	-	317	80p	QX56L	7470	TTL	-	313	57p
	4009UBE	see 4049UBE	-	310		UF24B	4527BE	CMOS	-	325	£1.65	QX57M	7472	TTL	-	313	57p
	4010BE	see 4050BE	-	310			4528BE	see 4098BE	-	326		QX58N	7473	TTL	-	313	57p
QX05F	4011BE	CMOS	-	305	23p	QW89W	4532BE	CMOS	-	319	£1.95	UB18U	74HC73	HC	-	313	68p
QL04E	4011UBE	CMOS	-	305	23p	UF23A	4536BE	CMOS	-	318	£2.85	YF30H	74LS73	TTL	-	313	34p
QX06G	4012BE	CMOS	-	305	23p	QQ47B	4541BE	CMOS	-	327	£1.09	QX59P	7474	TTL	-	312	51p
QX07H	4013BE	CMOS	-	312	34p	QW90X	4555BE	CMOS	-	319	69p	YF33L	74ALS74	HC	-	312	45p
QW15R	4014BE	CMOS	-	315	57p		4580BE	see 40108BE	-	314		UB19V	74HC74	HC	-	312	80p
QW16S	4015BE	CMOS	-	315	46p		4581BE	see 40181BE	-	325		YF31J	74LS74	TTL	-	312	40p
QX08J	4016BE	CMOS	-	323	28p		4582BE	see 40182BE	-	325		QX60Q	7475	TTL	-	314	63p
QX09K	4017BE	CMOS	-	317	51p		4585BE	see 4063BE	-	324		UB20W	74HC75	HC	-	314	68p
QX10L	4018BE	CMOS	-	317	63p	UF20W	4597BE	CMOS	-	314	£3.75	YF32K	74LS75	TTL	-	314	51p
QW17T	4019BE	CMOS	-	308	40p	UF21X	4598BE	CMOS	-	314	£2.85	QX61R	7476	TTL	-	313	51p
QX11M	4020BE	CMOS	-	318	57p	UF22Y	4599BE	CMOS	-	314	£2.40	UB21X	74HC76	HC	-	313	68p
QW18U	4021BE	CMOS	-	315	63p	QQ51F	45100BE	CMOS	-	324	£2.95	YF33L	74LS76	TTL	-	313	46p
QW19V	4022BE	CMOS	-	317	69p	UF35Q	4702B	Clock	-	356	£8.95	QX85G	7483	TTL	-	324	£1.15
QX12N	4023BE	CMOS	-	305	23p	QX35Q	5W Zener 5V6	Zener	17	302	£1.30		74LS83	see 74LS283	-	324	
QX13P	4024BE	CMOS	-	318	39p	QX36P	5W Zener 8V2	Zener	17	302	£1.30	QX62T	7485	TTL	-	324	£1.15
QX14Q	4025BE	CMOS	-	307	23p	UF33L	6116-3 (446-3)	SRAM	-	370	£2.30	UB22Y	74HC85	HC	-	324	£1.35
QX15R	4026BE	CMOS	-	318	£1.03	UF34M	6264-3	SRAM	-	370	£6.50	YF35Q	74LS85	TTL	-	324	80p
QX16S	4027BE	CMOS	-	313	34p	QR55K	634SS2	Hall Effect	-	352	£8.50	QX64U	7486	TTL	-	308	46p
QX17T	4028BE	CMOS	-	319	46p	QQ04E	6402	JART	-	369	£5.85	UB23A	74HC86	HC	-	308	69p
QW20W	4029BE	CMOS	-	317	51p	QQ02C	6502	Micro	-	366	£7.95	YF36P	74LS86	TTL	-	308	40p
	4030BE	see 4070BE	-	308	51p	UF25C	6522 VIA	VIA	-	366	£5.95	QX65V	7489	TTL	-	316	£2.30
QW22Y	4032BE	CMOS	-	325	74p	RA92A	65256	PSRAM	-	370	£16.95	QX66W	7490	TTL	-	317	63p
QW23A	4033BE	CMOS	-	318	£1.49	QW94C	7106	A D	-	378	£8.95	YF38R	74LS90	TTL	-	317	57p
QW25C	4035BE	CMOS	-	315	80p	QW95D	7107	A D	-	378	£9.95	QX88V	74109	TTL	-	315	80p
QW26D	4038BE	CMOS	-	325	86p	UF28F	7136CPL	A D	-	378	£8.95	QX67X	7492	TTL	-	317	£1.26
QW27E	4040BE	CMOS	-	318	51p	QX37S	7400	TTL	-	305	28p	YF39N	74LS92	TTL	-	317	63p
QW28F	4041UBE	CMOS	-	311	63p	UB00A	74HC00	HC	-	305	62p	QX68Y	7493	TTL	-	317	57p
QX19V	4042BE	CMOS	-	314	51p	YF00A	74LS00	TTL	-	305	28p	YF40T	74LS93	TTL	-	317	63p
QW29G	4043BE	CMOS	-	313	51p	QX38R	7401	TTL	-	305	28p	QX70M	7495	TTL	-	315	69p
QW30H	4044BE	CMOS	-	313	57p	YF01B	74LS01	TTL	-	305	28p	QX87U	7496	TTL	-	315	86p
QW32K	4046BE	CMOS	-	327	68p	QX39N	7402	TTL	-	307	28p	QX71N	74107	TTL	-	313	51p
QX20W	4047BE	CMOS	-	326	57p	UB01B	74HC02	HC	-	307	62p	UB24B	74HC107	HC	-	313	80p
QW33L	4048BE	CMOS	-	308	57p	YF02C	74LS02	TTL	-	307	28p	YF43W	74LS107	TTL	-	313	46p
QX21X	4049UBE	CMOS	-	310	28p	QX74R	7403	TTL	-	305	28p	QX88V	74109	TTL	-	313	80p

Order	Device	Type	Table	Page	Price	Order As Device	Type	Table	Page	Price	Order As Device	Type	Table	Page	Price		
YF55K	74LS145	TTL	-	319	£1.09	UB55K	74HC238	HC	-	319	£1.45	YH22Y	74LS393	TTL	-	317	£1.15
QX89W	74150	TTL	-	321	£1.95	UB56L	74HCT238	HC	-	319	£1.20	YH23A	74LS395	TTL	-	315	£1.26
WH07H	74151	TTL	-	321	69p	UB57M	74HC240	HC	-	311	£2.20	UB86T	74HC490	HC	-	317	£3.95
UB36P	74HC151	HC	-	321	98p	UB58N	74HCT240	HC	-	311	£1.55	UB87U	74HC533	HC	-	314	£1.95
YF56L	74LS151	TTL	-	321	80p	YF87U	74LS240	TTL	-	311	92p	UB88V	74HCT533	HC	-	314	£2.85
UB37S	74HC153	HC	-	321	£1.09	UB59P	74HC241	HC	-	311	£1.85	UB89W	74HC534	HC	-	312	£2.85
YF57M	74LS153	TTL	-	321	80p	UB60Q	74HCT241	HC	-	311	£2.85	UB90X	74HCT534	HC	-	312	£2.85
WH08J	74154	TTL	-	320	£1.49	YF88V	74LS241	TTL	-	311	£1.09	UB91Y	74HC540	HC	-	311	£1.95
UB38R	74HC154	HC	-	320	£2.35	UB61R	74HC242	HC	-	311	£1.35	UB92A	74HCT540	HC	-	311	£1.95
YF58N	74LS154	TTL	-	320	£1.78	UB62S	74HCT242	HC	-	311	£2.60	UB93B	74HC541	HC	-	311	£1.95
YF59P	74LS155	TTL	-	319	80p	UB63T	74HC243	HC	-	311	£1.35	UB94C	74HCT541	HC	-	311	£3.45
UB39N	74HC157	HC	-	321	£1.35	UB64U	74HCT243	HC	-	311	£2.60	QY42V	74LS604	TTL	-	321	£4.95
YF61R	74LS157	TTL	-	321	69p	YF90X	74LS243	TTL	-	311	£1.09	WH02C	74LS629	TTL	-	327	£1.49
UB40T	74HC158	HC	-	321	90p	UB65V	74HC244	HC	-	311	£1.85	UB95D	74HC640	HC	-	311	£2.20
YF62S	74LS158	TTL	-	321	69p	UB66W	74HCT244	HC	-	311	£2.85	UB96E	74HC643	HC	-	311	£2.20
WH09K	74160	TTL	-	317	£1.15	QQ56L	74LS244	TTL	-	311	92p	QQ63T	74LS684	TTL	-	323	£3.99
YF63T	74LS160	TTL	-	317	80p	UB67X	74HC245	HC	-	311	£2.20	YH30H	74C917	Decoder	-	354	£9.95
UB41U	74HC161	HC	-	317	£1.55	UB68Y	74HCT245	HC	-	311	£2.85	QY08J	74C925	Counter	-	355	£7.25
YF64U	74LS161	TTL	-	317	80p	YF91Y	74LS245	TTL	-	311	£1.15	UB97F	74HC4002	HC	-	307	62p
UB42V	74HC163	HC	-	317	£1.35	YF92A	74LS251	TTL	-	321	86p	UB98G	74HC4016	HC	-	328	£5.50
YF66W	74LS163	TTL	-	317	80p	UB69A	74HC257	HC	-	321	98p	UB99H	74HC4017	HC	-	317	£1.35
WH10L	74164	TTL	-	315	£1.26	YF95D	74LS257	TTL	-	321	86p	UF00A	74HC4020	HC	-	318	£1.60
UB43W	74HC164	HC	-	315	£1.55	YF96E	74LS258	TTL	-	321	86p	UF01B	74HC4024	HC	-	318	£1.60
YF67X	74LS164	TTL	-	315	86p	UB70M	74HC259	HC	-	314	£2.60	UF02C	74HC4040	HC	-	318	£1.45
YF68Y	74LS165	TTL	-	315	£1.26	YF97F	74LS259	TTL	-	314	£1.42	UF03D	74HC4046	HC	-	327	£5.50
YF69A	74LS166	TTL	-	315	£1.72	QY59P	74LS260	TTL	-	307	80p	UF04E	74HC4049	HC	-	310	95p
YF71N	74LS169	TTL	-	317	£1.15	UB71N	74HC266	HC	-	308	98p	UF05F	74HC4050	HC	-	310	95p
YF72P	74LS170	TTL	-	314	£1.60	YF99H	74LS266	TTL	-	308	69p	UF06G	74HC4051	HC	-	322	NYA
YF73Q	74LS173	TTL	-	314	£1.15	UB72P	74HC273	HC	-	312	£2.40	UF07H	74HC4052	HC	-	322	£2.40
WH11M	74174	TTL	-	312	£1.26	YH00A	74LS273	TTL	-	312	£1.38	UF08J	74HC4053	HC	-	323	NYA
UB44X	74HC174	HC	-	312	£1.38	YH01B	74LS279	TTL	-	313	80p	UF09K	74HC4060	HC	-	318	£1.20
YF74R	74LS174	TTL	-	312	86p	UB73Q	74HC283	HC	-	324	£3.85	UF10L	74HC4066	HC	-	323	£1.85
UB45Y	74HC175	HC	-	312	£1.38	YH02C	74LS283	TTL	-	324	92p	UF11M	74HC4075	HC	-	307	85p
YF75S	74LS175	TTL	-	312	80p	UB74R	74HC292	HC	-	318	NYA	UF12N	74HC4078	HC	-	307	85p
YF76H	74LS181	TTL	-	325	£2.18	YH06G	74LS298	TTL	-	321	£1.15	UF13P	74HC4316	HC	-	328	NYA
UB46A	74HC190	HC	-	317	£1.80	UB75S	74HC352	HC	-	321	£1.35	UF14Q	74HC4351	HC	-	322	NYA
YF78K	74LS190	TTL	-	317	97p	UB76H	74HC354	HC	-	321	£4.95	UF15R	74HC4352	HC	-	322	NYA
UB47B	74HC191	HC	-	317	£1.80	UB77J	74HC356	HC	-	321	£4.95	UF16S	74HC4353	HC	-	323	NYA
YF79L	74LS191	TTL	-	317	97p	UB78K	74HC365	HC	-	310	£1.35	UF17T	74HC4511	HC	-	320	£1.85
WH12N	74192	TTL	-	317	£1.38	YH11M	74LS365	TTL	-	310	57p	UF18U	74HC4514	HC	-	320	£1.95
UB48C	74HC192	HC	-	317	£1.80	YH12N	74LS366	TTL	-	310	57p	UF19V	74HC4538	HC	-	326	£1.85
YF80B	74LS192	TTL	-	317	92p	UB79L	74HC367	HC	-	310	£1.35	QY56L	7581 ADC	A/D	-	376	£24.95
UB49D	74HC193	HC	-	317	£1.80	YH13P	74LS367	TTL	-	310	57p	UF53H	75491	Driver	-	354	74p
YF81C	74LS193	TTL	-	317	92p	YH14Q	74LS368	TTL	-	310	57p	YH33L	76489	Sound Gen	-	344	£5.75
WH13P	74194	TTL	-	315	£1.15	UB80B	74HC373	HC	-	314	£1.95	YH34M	8T28	Interface	-	368	£2.75
UB50E	74HC194	HC	-	315	£1.35	UB81C	74HCT373	HC	-	314	£2.60	8T97	see 74LS367	Generator	-	371	
YF82D	74LS194	TTL	-	315	86p	YH15R	74LS373	TTL	-	314	£1.15	YH38R	8038CCPD	V Ref	-	310	£5.95
UB51F	74HC195	HC	-	315	£1.35	UB82D	74HC374	HC	-	312	£1.95	YH39R	8069CCZR	V Ref	-	359	£1.95
YF83E	74LS195	TTL	-	315	86p	UB83E	74HCT374	HC	-	312	£2.85	YH41U	8085A	MPU	-	366	£5.95
YF84F	74LS196	TTL	-	317	97p	YH16S	74LS374	TTL	-	312	£1.15	YH43W	8211CPA	Indicator	-	359	£2.95
YF85G	74LS197	TTL	-	317	97p	YH18U	74LS377	TTL	-	312	£1.49	YH44X	8212	IO	-	368	£2.50
UB52G	74HC221	HC	-	326	£2.85	YH19V	74LS378	TTL	-	312	£1.09	YH45Y	8216	Bus Driver	-	368	£1.72
YF86T	74LS221	TTL	-	326	97p	UB84F	74HC390	HC	-	317	£1.60	YH49D	8251	USART	-	367	£3.95
UB53H	74HC237	HC	-	319	£1.35	YH21X	74LS390	TTL	-	317	69p	YH50E	8255A	PIA	-	367	£4.15
UB54J	74HCT237	HC	-	319	£1.20	UB85G	74HC393	HC	-	317	£1.95	YH51F	8279	Interface	-	368	£7.95

IMPORTANT NOTE

With many of the IC's shown in this section of the catalogue we include an application circuit taken from the manufacturer's data sheet. These circuits are *not* intended to be complete projects in any way, but are to give the *experienced* constructor a basis on which to design circuits for his own particular application. The only assistance we can provide regarding these application circuits, is to supply the customer with the relevant data sheet for that particular IC.

We can supply data sheets for any of the IC's we stock, priced 40p each. Although some of these may only be a couple of sheets giving electrical specifications, the vast majority will usually contain a good deal of information on the use of the IC, including example application circuits. In addition, please note that we cannot provide data sheets for smaller devices such as diodes, transistors, triacs etc. We will have included any relevant information we have for such a device in this catalogue. The only other source of information will be semiconductor data books, see Books Section.

Table 1 Low and Medium Power Germanium Transistors Low Frequency

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
AC126	T01a	PNP	-12	-32	-10	100	220	140 @ 2mA	2.3	Pre-amp driver
AC127	T01a	NPN	32	32	10	500	340	>50 @ 20mA	2.5	Class 'B' outputs
AC128	T01a	PNP	-16	-32	-10	1A	1W	90 @ 300mA	1.5	Class 'A' and 'B' outputs (comp to AC176)
AC141	T01a	NPN	30	32		400	720	>80 @ 400mA	3	General purpose
AC142	T01a	PNP	-30	-30		400	720	<80 @ 400mA	1.5	General purpose
AC176	T01a	NPN	32	32	5	350	700	100 @ 500mA	1	Class 'B' outputs (comp to AC128)
AC187	T01a	NPN	15	25	10	1A	1W	200 @ 300mA	5	Class 'B' outputs up to 3W (comp to AC188)
AC188	T01a	PNP	-15	-25	-10	1A	1W	200 @ 300mA	1.5	Class 'B' outputs up to 3W (comp to AC187)
ACY19	T05	PNP	-40	-50	-12	500	260	>140 @ 300mA	1.3	Switching and general
OC71	T01b	PNP	-30	-30	-10	10	125	>41 @ 1mA	5kHz	A.F. amp
OC81	T01b	PNP	-16	-32		200	600	150 @ 50mA	1	Class 'B' output

Table 2 Small Signal Frequency Germanium Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
AF139	T072	PNP	-15	-22	-0.3	10	60	50 @ 1.5mA	550	UHF amps up to 860MHz
AF239	T072	PNP	-15	-20	-0.3	10	60	30 @ 5mA	700	TV-UHF pre-amps up to 900MHz
OC45	T01b	PNP	-15	-15	-8	5	70	60 @ 1mA	3	I.F. amps

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

Table 3 Germanium Power Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
AD149	T03	PNP	-50	-50	-20	3.5A	22.5W	65 @ 1A	0.5	Class 'B' push-pull outputs
AD161	SO55	NPN	20	32	10	1A	4W	150 @ 500mA	3	Audio outputs (comp to AD162)
AD162	SO55	PNP	-20	-32	-10	1A	6W	150 @ 500mA	1.5	Audio outputs (comp to AD161)

Table 4 Small Signal Low Frequency Silicon Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
BC107B	T018	NPN	45	50	6	100	300	290 @ 2mA	300	A.F. driver (comp to BC177)
BC108C	T018	NPN	20	30	5	100	300	520 @ 2mA	300	General purpose (comp to BC178)
BC109C	T018	NPN	20	30	5	100	300	520 @ 2mA	300	Very low noise high gain amp (comp to BC179)
BC117	T039	NPN	120	120	5	20	300	40 @ 30mA	40	High voltage
BC168C	T092	NPN	20	30	5	100	300	650 @ 2mA	85	General purpose
BC169C	T092	NPN	20	30	5	50	300	650 @ 2mA	150	High gain, low noise amp
BC177	T018	PNP	-45	-50	-5	100	300	240 @ 2mA	200	A.F. amp (comp to BC107)
BC178	T018	PNP	-25	-30	-5	100	300	240 @ 2mA	200	General purpose (comp to BC108)
BC179	T018	PNP	-20	-25	-5	100	300	410 @ 2mA	200	High gain, low noise (comp to BC109)
BC182L	T092	NPN	50	60	5	200	300	>125 @ 2mA	150	A.F. driver (comp to BC212L)
BC183L	T092	NPN	30	45	5	200	300	>125 @ 2mA	150	General purpose (comp to BC213L)
BC184L	T092	NPN	30	45	5	200	300	>125 @ 2mA	150	Low noise, high gain amp (comp to BC214L)
BC204	T0106	PNP	-45	-50	-5	100	300	160 @ 2mA	160	General amps
BC209C	T0106	NPN	20	25	5	100	300	520 @ 2mA	200	Audio amp inputs
BC212L	T092	PNP	-50	-60	-5	200	300	>60 @ 2mA	200	A.F. driver (comp to BC182L)
BC213L	T092	PNP	-30	-45	-5	200	300	>80 @ 2mA	200	General purpose (comp to BC183L)
BC214L	T092	PNP	-30	-45	-5	200	300	>140 @ 2mA	200	Low noise, high gain amp (comp to BC184L)
BC547	T092a	NPN	45	50	6	100	500	520 @ 2mA	300	BC107 in plastic package
BC548	T092a	NPN	30	30	5	100	500	520 @ 2mA	300	BC108 in plastic package
BC549	T092a	NPN	30	30	5	100	500	520 @ 2mA	300	BC109 in plastic package
BC557	T092a	PNP	-45	-50	-5	100	500	240 @ 2mA	150	BC177 in plastic package
BC558	T092a	PNP	-30	-30	-5	100	500	240 @ 2mA	150	BC178 in plastic package
BC559	T092a	PNP	-30	-30	-5	100	500	240 @ 2mA	150	BC179 in plastic package
BC650	T092b	NPN	30	30	5	100	625	750 @ 2mA	300	Ultra low noise high gain audio inputs
BCY70	T018	PNP	-40	-50	-5	200	350	300 @ 1mA	450	General purpose
BCY71	T018	PNP	-45	-45	-5	200	350	300 @ 1mA	450	General purpose
MPSA14	T092b	NPN	30	30	300	500	10,000 @ 10mA	125	125	Darlington amp
MPSA65	T092b	PNP	-30	-30	300	500	50,000 @ 10mA	175	175	Darlington amp
MPS3638	T092b	PNP	-25	-25	-4	500	310	>20 @ 10mA	100	General purpose amp and switch
MPS3638A	T092b	PNP	-25	-25	-4	500	310	>100 @ 10mA	150	General purpose amp and switch
PN3643	T092b	NPN	30	60	5	500	350	200 @ 150mA	250	General purpose (comp to MPS3638/A)
ZTX107	E-line	NPN	50	60	5	100	300	240 @ 2mA	300	
ZTX108	E-line	NPN	30	45	5	100	300	240 @ 2mA	350	
ZTX109	E-line	NPN	30	45	5	100	300	410 @ 2mA	350	
ZTX300	E-line	NPN	25	25	5	500	300	150 @ 10mA	150	(comp to ZTX500)
ZTX302	E-line	NPN	35	35	5	500	300	>100 @ 10mA	200	(comp to ZTX502)
ZTX304	E-line	NPN	70	70	5	500	300	>50 @ 10mA	150	(comp to ZTX504)
ZTX500	E-line	PNP	-25	-25	-5	500	300	150 @ 10mA	150	(comp to ZTX300)
ZTX502	E-line	PNP	-35	-35	-5	500	300	>100 @ 10mA	150	(comp to ZTX302)
ZTX504	E-line	PNP	-70	-70	-5	500	300	>50 @ 10mA	150	(comp to ZTX304)
ZTX541	E-line	PNP	-100	-100		100	500	>30 @ 2mA		
ZTX542	E-line	PNP	-120	-120		100	500	>40 @ 10mA		
2N706	T018	NPN	20	25	3	100	300	>20 @ 10mA	200	High speed switching
2N2906	T018	PNP	-40	-60	-5	600	400	80 @ 150mA	200	High speed switching
2N2907	T018	PNP	-40	-60	-5	600	400	200 @ 150mA	200	High speed switching
2N2926 (Or)	T098	NPN	18	18	5	100	200	150 @ 2mA	200	General purpose
2N2926 (Ye)	T098	NPN	18	18	5	100	200	210 @ 2mA	200	General purpose
2N2926 (Gr)	T098	NPN	18	18	5	100	200	360 @ 2mA	200	General purpose
2N3702	T092	PNP	-25	-40	-5	200	300	180 @ 50mA	100	Audio amp
2N3703	T092	PNP	-30	-50	-5	200	300	90 @ 50mA	100	Audio amp
2N3704	T092	NPN	30	50	5	800	360	200 @ 50mA	100	Audio amp
2N3705	T092	NPN	30	50	5	800	360	100 @ 50mA	100	Audio amp
2N3706	T092	NPN	20	40	5	800	360	315 @ 50mA		Audio amp
2N3707	T092	NPN	30	30	6	30	250	250 @ 0.1mA		Low level, low noise amp
2N3708	T092	NPN	30	30	6	30	250	360 @ 1mA		General purpose
2N3711	T092	NPN	30	30	6	30	250	420 @ 1mA		General purpose
2N3903	T092b	NPN	40	60	5	200	300	100 @ 10mA		General purpose
2N3904	T092b	NPN	40	60	6	200	310	>100 @ 10mA		General purpose
2N3905	T092b	PNP	-40	-40	-5	200	310	>50 @ 10mA		General purpose
2N3906	T092b	PNP	-40	-40	-5	200	310	>100 @ 10mA		General purpose
2N4058	T092	PNP	-30	-30	-6	100	360	250 @ 0.1mA		General purpose
2N4062	T092	PNP	-30	-30	-6	100	360	420 @ 1mA		General purpose
2SA872	T092	PNP	-90	-90	-5	50	300	500 @ 2mA	120	Low noise amp
2SA1085	T092	PNP	-120	-120	-5	100	400	400 @ 2mA	90	Very low noise amp
2SC2547	T092	NPN	120	120	5	100	400	400 @ 2mA	90	Very low noise amp

Matched Pairs

Some of the transistors we supply are available in matched pairs. They are matched by the manufacturer and in general, the ratio of the gains h_{FE2}/h_{FE1} does not exceed 1.25 (usually it is much closer). To achieve this, the manufacturer chooses a suitable range of gain groups into which the transistors, after automatic testing, are grouped. Now any transistor of a particular

group will be a match (within the above tolerance) with any other transistor in that group. So if we supply matched pairs to you (in one batch) and they are not joined in pairs, then any transistor in that batch will make a pair with any other transistor in that batch. If they are joined in pairs, however, it is best to assume that other joined pairs may not be from the same batch.

Table 5 Medium Power Low Frequency Silicon Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
BC119	T039	NPN	30	60	5	500	800	90 @ 150mA	40	Up to 1W class 'A', 6W class 'B' audio output stages
BC139	T039	PNP	-40	-40	-5	500	700	90 @ 100mA	200	For audio output and driver stages
BC140	T039	NPN	40	60	7	1A	800	140 @ 100mA	50	Audio amps and switching up to 1A (comp to BC160)
BC141	T039	NPN	60	80	7	1A	800	140 @ 100mA	50	Audio amps and switching up to 1A (comp to BC161)
BC142	T05	NPN	60	80	5	800	800	>20 @ 200mA	40	Audio driver
BC143	T05	PNP	-60	-60	-5	800	800	>25 @ 500mA	100	Audio driver
BC160	T039	PNP	-40	-60	-5	1A	800	140 @ 100mA	50	Audio amps and switching up to 1A (comp to BC140)
BC161	T039	PNP	-60	-80	-5	1A	800	140 @ 100mA	50	Audio amps and switching up to 1A (comp to BC141)
BC301/5	T039	NPN	60	90	7	500	850	105 @ 150mA	120	Audio driver stages (comp to BC303/5)
BC303/5	T039	PNP	-60	-85	-7	500	850	105 @ 150mA	75	Audio driver stages (comp to BC301/5)
BC327	T092h	PNP	-45	-50	-5	500	625	350 @ 100mA	100	Driver and output stages in audio amps (comp to BC337)
BC328	T092h	PNP	-25	-30	-5	500	625	350 @ 100mA	100	Driver and output stages in audio amps (comp to BC338)
BC337	T092h	NPN	45	50	5	500	625	350 @ 100mA	200	Driver and output stages in audio amps (comp to BC327)
BC338	T092h	NPN	25	30	5	500	625	350 @ 100mA	200	Driver and output stages in audio amps (comp to BC328)
BC441	T039	NPN	60	75	5	2A	1W	100 @ 500mA	50	Drivers and general purpose (comp to BC461)
BC461	T039	PNP	-60	-75	-5	2A	1W	100 @ 500mA	50	Drivers and general purpose (comp to BC441)
BFX29	T05	PNP	-60	-60	-5	600	600	125 @ 10mA	360	A.F. driver
BFX30	T05	PNP	-65	-65	-5	600	600	90 @ 10mA	100	A.F. switch
BFX84	T05	NPN	60	100	6	1A	800	112 @ 150mA	50	General purpose
BFX85	T05	NPN	60	100	6	1A	800	142 @ 150mA	50	General purpose
BFX87	T05	PNP	-50	-50	-4	600	600	125 @ 10mA	360	General purpose
BFX88	T05	PNP	-40	-40	-4	600	600	125 @ 10mA	360	General purpose
BFY50	T05	NPN	35	80	6	1A	800	112 @ 150mA	50	General purpose
BFY51	T05	NPN	30	60	6	1A	800	123 @ 150mA	50	General purpose
BFY52	T05	NPN	20	40	6	1A	800	142 @ 150mA	50	General purpose
2N697	T05	NPN	40	60	5	500	600	75 @ 150mA	100	Switching and amps
2N1711	T05	NPN	30	75	7	1A	800	200 @ 150mA	100	General purpose
2N1893	T05	NPN	80	120	7	500	800	80 @ 150mA	50	Amplifier outputs
2N2219	T05	NPN	30	60	5	800	800	200 @ 150mA	50	High speed switching
2N2905	T05	PNP	-40	-60	-5	600	600	200 @ 150mA	200	High speed switching
2N3053	T05	NPN	40	60	5	700	800	150 @ 150mA	100	Driver
2SB716	T092	PNP	-120	-120	-5	50	750	500 @ 2mA	350	High voltage amp (comp to 2SD756)
2SD756	T092	NPN	120	120	5	50	750	700 @ 2mA	150	High voltage amp

Table 6 High Power Low Frequency Silicon Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
BD131	T0126	NPN	45	70	6	3A	15W	>40 @ 500mA	60	A.F. output (comp to BD132)
BD132	T0126	PNP	-45	-45	-4	3A	15W	>40 @ 500mA	60	A.F. output (comp to BD131)
BD135	T0126	NPN	45	45	5	1A	8W	100 @ 150mA	250	A.F. driver amp (comp to BD136)
BD136	T0126	PNP	-45	-45	-5	1A	8W	100 @ 150mA	75	A.F. driver amp (comp to BD135)
BD139	T0126	NPN	80	100	5	1A	8W	100 @ 150mA	250	A.F. driver amp (comp to BD140)
BD140	T0126	PNP	-80	-100	-5	1A	8W	100 @ 150mA	75	A.F. driver amp (comp to BD139)
BD711	P1b	NPN	100	100	5	12A	75W	25 @ 4A	3	Audio amp (comp to BD712)
BD712	P1b	PNP	-100	-100	-5	12A	75W	25 @ 4A	3	Audio amp (comp to BD711)
MJ2501	T03	PNP	-80	-80	-5	10A	150W	1000 @ 5A (min)	1	High power darlington (comp to MJ3001)
MJ2955	T03	PNP	-60	-100	-7	15A	150W	45 @ 4A	4	General purpose (comp to 2N3055)
MJ3001	T03	NPN	80	80	5	10A	150W	1000 @ 5A (min)	1	High power darlington (comp to MJ2501)
MJE340	T0126	NPN	300	300	3	500	20W	150 @ 50mA	20	Audio output stages
MJE350	T0126	PNP	-300	-300	-3	500	20W	150 @ 50mA	20	Audio output stages (comp to MJE340)
TIP31A	P1b	NPN	60	60	5	3A	40W	25 @ 3A	3	Audio amp (comp to TIP32A)
TIP32A	P1b	PNP	-60	-60	-5	3A	40W	25 @ 3A	3	Audio amp (comp to TIP31A)
TIP33A	P3c	NPN	60	60	5	10A	80W	75 @ 3A	3	Audio amp (comp to TIP34A)
TIP34A	P3c	PNP	-60	-60	-5	10A	80W	75 @ 3A	3	Audio amp (comp to TIP33A)
TIP41A	P1b	NPN	60	60	5	5A	65W	50 @ 3A	3	Audio amp (comp to TIP42A)
TIP42A	P1b	PNP	-60	-60	-5	5A	65W	50 @ 3A	3	Audio amp (comp to TIP41A)
TIP122	P1b	NPN	100	100	5	5A	65W	5000 @ 2A	5	High power darlington (comp to TIP127)
TIP127	P1b	PNP	-100	-100	-5	5A	65W	3000 @ 2A	5	High power darlington (comp to TIP122)
TIP2955	P3c	PNP	-70	-100	-7	15A	90W	45 @ 4A	2	General purpose (comp to TIP3055)
TIP3055	P3c	NPN	70	100	7	15A	90W	45 @ 4A	2	General purpose (comp to TIP2955)
2N3054	T066	NPN	55	90	7	4A	29W	>25 @ 500mA	1	Audio amp
2N3055	T03	NPN	60	100	7	15A	115W	45 @ 4A	0.8	General purpose (comp to MJ2955)
*2N3055H	T03	NPN	60	100	7	15A	115W	45 @ 4A	0.8	General purpose (comp to MJ2955)
2N3772	T03	PNP	-60	100	7	20A	150W	30 @ 10A	0.8	High current power amps
2N3773	T03	NPN	140	160	7	16A	150W	40 @ 4A	0.2	Power switching, audio amps, inverters, solenoid drivers
2N6609	T03	PNP	-140	-160	-7	16A	150W	40 @ 4A	0.2	Power switching, audio amps, inverters, solenoid drivers (comp to 2N3773)
2SA715	T0126	PNP	-35	-35	-5	2.5A	10W	150 @ 500mA	160	Power switching
2SC1162	T0126	NPN	30	30	5	2.5A	10W	100 @ 500mA	180	Power switching

*2N3055H is a homotaxial base device which is highly resistant to secondary breakdown over a wide range of operating conditions.

Table 7 Small Signal High Frequency Silicon Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
BF115	S0-12A	NPN	30	50	5	30	145	40 @ 1mA	230	AM/FM
BF167	S0-12A	NPN	30	40	4	25	130	45 @ 1mA	600	TV video I.F.. Has very low feedback capacitance
BF173	T072a	NPN	25	25	3	25	260	38 @ 7mA	350	R.F. amps
BF180	T072	NPN	20	30	3	20	150	††24dB @ 200MHz	675	UHF TV R.F. amps, tuners
BF200	T072	NPN	20	30	3	20	150	††28dB @ 100MHz	270	TV VHF and FM tuners
BF494	T092k	NPN	20	30	5	30	300	115 @ 1mA	260	AM/FM Low noise receiver I.F. stages
BF495	T092k	NPN	20	30	5	30	300	67 @ 1mA	200	AM/FM input stages
BFY90	T072	NPN	15	30	2.5	50	200	52 @ 2mA	1850	Wideband amps (40 - 860MHz)
BSX20	T018	NPN	15	40	4.5	500	360	80 @ 10mA	500	High speed saturated switch and HF amps
2N2369A	T018	NPN	15	40	4.5	200	360	>40 @ 10mA	500	High speed saturated switch and HF amps

†† G_{UM}: Maximised unilateralised power gain.

Table 8 Medium and High Power High Frequency Silicon Transistors

Type No.	Case Style	Material	V _{CEO} (max) V	V _{CBO} (max) V	V _{EBO} (max) V	I _C (max) mA	P _{TOT} (max) mW	Typ h _{FE} @ I _C (mA)	Typ f _T (MHz)	Application
BF258	T05	NPN	250	250	5	100	800	>251 @ 30mA	90	High voltage video output amp
BF259	T05	NPN	300	300	5	100	800	>25 @ 30mA	90	High voltage video output amp
BF337	T039	NPN	200	250	5	100	800	60 @ 30mA	80	R-G-B and colour difference outputs in colour TV's
BU205	T03	NPN	†1500		7	2.5A	10W	2 @ 2A	7.5	Line output stages in TV's
BU208	T03	NPN	†1500		7	5A	12.5W	2.25 @ 4.5A	7	Line output stages in colour TV's
R2008B	T03	NPN	*660			8A	85W			Replacement for TV's
2N3866	T05	NPN	30	55	3.5	400	5W	105 @ 50mA	700	UHF amp
2SC1307	P1b	NPN	*70	70	4	8A	25W	100 @ 2A	150	CB output stages up to 10W in Class C

† Non repetitive peak voltage

* The maximum allowable continuous collector to emitter voltage with a small reverse bias applied to the emitter base junction.

Table 9 N Channel Field Effect Transistors

Type No.	Case Style	P _{TOT} (max) mW	V _{DS} (max) V	V _{DG} (max) V	V _{GS} (max) V	I _{GSS} (max) nA	Y _{FS} (typical) μmhos (V _{GS} = 0V)	Max input Capacitance (pF)	I _{loss} (max) mA	Application
BF244	T092d	360	30	30	30	7	4500	4	25	DC, low and high frequency amps
BFW 10	T012	300	30	30	30	0.1	3200	4	20	Very low noise at low frequency, wideband amps up to 300MHz
MPF102	T092c	200	25	25	25	2	1600 @ 100MHz	7	20	R.F. amps
2N3819	T092d	200	25	25	25	2	4000	8	20	General purpose
2N5458	T092c	310	25	24	25	0.1	3500	7	9	General purpose
2N5459	T092c	310	25	25	25	0.1	4000	7	16	General purpose
3N140	T072f	330	20	20	20	1	10,000	5.5	30	Dual insulated gate tetrode MOS R.F. amplifier
40673	T072f	330	20	20	6	50	12,000	6	35	Dual insulated gate tetrode MOS R.F. amplifier

Table 10 VMOS Power FET's

Type No.	Case Style	P _{TOT} (max) W	V _{OS} (max) V	V _{DG} (max) V	V _{GS} (max) V	Gate Threshold Voltage (min to max) V	I _{GSS} (max) μA	Forward Transconductance mS (typical)	I _o (max) A	I _{loss} (max) μA	Max Input Capacitance pF	Typical max Frequency MHz	Material
VN10KM	T092d	1	60	60	5*	0.3 to 2.5V	10	200	0.5	10	48		N-channel
VK1010	T092d	1	100	100	15*	2V max	10	200	0.5	10	48		N-channel
VN46AF	P1c	12.5	40	40	15*	0.8 to 2	10	250	2	10	50	600	N-channel
VN66AF	P1c	12.5	60	60	15*	0.8 to 2	10	250	2	10	50	600	N-channel
VN88AF	P1c	12.5	80	80	15*	0.8 to 2	10	250	2	10	50	600	N-channel
†2SJ48	T03v	100	-120	-120	14	-0.8 to -1.5		1000	7			900	P-channel
†2SJ49	T03v	100	-140	-140	14	-0.8 to -1.5		1000	7			900	P-channel
†2SJ50	T03v	100	-160	-160	±14	-0.8 to -1.5		1000	7			900	P-channel
†2SK133	T03v	100	120	120	14	1 to 1.5		1000	7			600	N-channel
†2SK134	T03v	100	140	140	14	1 to 1.5		1000	7			600	N-channel
†2SK135	T03v	100	160	160	±14	1 to 1.5		1000	7			600	N-channel

* Internal zener diode † Complementary pair

Table 11 Unijunction Transistors

Type No.	Case Style	P _{TOT} (max) mW	V _{EB20} V	I _E A	I _{EB} (max) nA	Peak point I _P (max) μA	Valley point I _V (mA)	Intrinsic stand-off ratio	Max static interbase resistance Ω	V _{B2-B1} V (max)
T1S43	T092e	300	30	1.5	10nA	5		0.55 to 0.82	4k to 9k1	35
2N2646	T018u	300	30	2	12μA	5	4	0.56 to 0.75		35
2N4871	T092g	300	30	1	1μA	5	4	0.7 to 0.85	4k to 9k1	35

Gain Groups

(BC107, BC108, BC109, BC168, BC169, BC209)

The above transistor types are all available in different gain (h_{FE}) groups. For example, say the design parameter calls for the transistor to have a gain of between 110 and 800, this will be divided into groups e.g. group A - 110 to 220; group B - 200 to 450; group C - 420 to 800. The transistors are then marked with their gain group after the type number (e.g. BC108C).

Transistors of the above types that have no suffix letter are ungraded and therefore where the plain-numbered device is specified a graded transistor will always, without qualification, do exactly the same job. Maplin only stock these transistors in the highest gain group and they are

therefore the best possible example of that transistor. Where a particular gain group is specified and it is not the highest gain group, a transistor capable of a higher gain will do exactly the same job in all practical commercial applications that we have ever seen. Therefore, for example our BC108C can be used with complete confidence where a BC108, BC108A, or BC108B is specified. (These latter types are often specified in manufacturers' data because the lower gain would suffice and they are marginally cheaper than the 'C' version and on large production runs, many thousands of pounds can be saved, although the price difference on just one transistor will probably be of the order of tenths of a penny).

Table 12 Programmable Unijunction Transistor, S.C.S. and Thyristor Tetrode

BRY39 (equivalent to 2N6027 and D13T1) may be used in any of three modes.

1. Programmable Unijunction Transistor: Applications include motor control, oscillators, relay replacement, timers, pulse shaper, trigger device and other switching applications. When used as a P.U.T. the cathode gate (G_k) is not used.

V _{G8A} (max)	Anode gate to anode voltage:	70V
I _A (max)	Anode current DC:	250mA
I _P	Peak point current (V _S = 10V, R _G = 10kΩ):	<5μA
I _V	Valley point current (V _S = 10V, R _G = 10kΩ):	>50μA
I _{ARM} (max)	Repetitive peak anode current:	2.5A
I _{G8AO} (max)	Anode gate to anode leakage current @ V _{G8A} = 70V:	10nA
I _{G8KS} (max)	Anode gate to cathode leakage current @ V _{G8K} = 70V:	100nA

2. Silicon Controlled Switch: It is an integrated PNP-NPN transistor pair, with all electrodes accessible. Applications include numerical indicator tube drivers and other switching applications.

	PNP transistor	NPN transistor
V _{CEO} (max)	-70V	
V _{CBO} (max)	-70V	70V*
V _{EB0} (max)	-70V*	5V*

* Higher voltages are permissible in numerical indicator tube driver circuits.

I _E (max)	DC emitter current:	175mA
I _{ERM}	Max repetitive peak emitter current:	2.5A
P _{TOT}	Max total dissipation:	275mW
V _{AK}	Forward on-state voltage:	<1.4V
I _H	Holding current:	<1mA
t _{on}	Turn on time:	<0.25μs
t _q	Turn off time:	<5μs
h _{fe}		>0.25 @ I _E = 1mA; >50 @ I _C = 10mA
f _T		300MHz (typ)

3. Thyristor Tetrode: Applications include relay and lamp drivers, sensing network for temperature and other switching application. Anode to cathode DC off-state voltage (V_D) and instantaneous total value of reverse voltage (V_R): 70V max.

Max DC on-state current:	205mA
On-state voltage:	1.4V
Peak reverse current @ V _R = 70V:	1nA (typ); 100nA (max)
Holding current (max):	250μA

	Cathode gate to cathode		Anode gate to anode	
Voltage that will trigger all devices (V _D = 6V):	V _{GKT} : 0.5V (min)	V _{GAT} : 1V (min)		
Reverse peak voltage:	V _{GKM} : 5V (max)	V _{GAM} : 70V (max)		
Current that will trigger all devices (V _D = 6V):	I _{GKT} : 1μA (min)	I _{GAT} : 100μA (min)		
Forward peak current:	I _{GKM} : 100mA (max)	I _{GAM} : 100mA (max)		

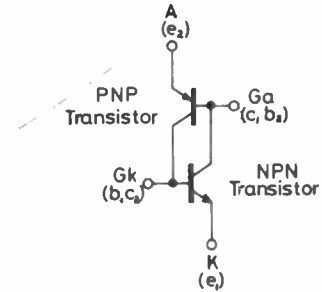
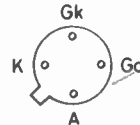


Table 13 Signal Diodes

Type No.	Construction	Case Style	PIV V	Max I _F (average) mA	Max reverse current I _R (μA @ V)	Application
AA119	Ge point contact	D07	45V	35mA	<350μA @ 45V	A.M. detector. In pairs as a ratio detector
BAR28	Schottky barrier	D035	70V		<200nA @ 50V	Low forward voltage (V _F = 410mV at 1mA), suitable replacement for germanium, very fast >10GHz
BAX13	Si diffused whiskerless	D035*	50V	75mA	<200nA @ 50V	Fast logic
BAX16	Si diffused whiskerless	D035*	150V	200mA	<100nA @ 150V	General purpose
BY206	Si double diffused	D014	350V	400mA	<2μA @ 300V	Top level detector and scan rectifier and for h.f. power supplies. Soft recovery
HSCH1001	Shottky barrier	D035	60V	15mA	<200nA @ 50V	Low forward voltage (V _F = 410mV at 1mA), suitable replacement for germanium, very fast >100GHz
0A47	Ge gold bonded	D07	25V	110mA	<100μA @ 25V	High speed switch
0A90	Ge point contact	D07	30V	10mA	<1.1mA @ 30V	High frequency detector
0A91	Ge point contact	D07	115V	50mA	<275μA @ 100V	General purpose
0A95	Ge point contact	D07	115V	50mA	<250μA @ 100V	General purpose
0A200	Si alloy junction	D07	50V	80mA	<100nA @ 50V	General purpose
0A202	Si alloy junction	D07	150V	40mA	<100nA @ 150V	General purpose
ZS120	Si alloy junction	D07	50V	250mA	<5μA @ 50V	General purpose
1N914	Si whiskerless	D035	100V	75mA	<25nA @ 20V	Fast logic
1N916	Si whiskerless	D035	100V	75mA	<25nA @ 20V	Low capacitance 1N914
1N4148	Si whiskerless	D035	100V	75mA	<25nA @ 20V	Fast logic
1S921	Si diffused	S06	100V	200mA	<100nA @ 100V	General purpose

* Sometimes supplied in SOD17 package.

Table 14 Varicaps

Type No.	Case Style	V _R (max)	I _R (typ)	Capacitance ratio	Capacitance at various voltages between (limits) 500 and 620pF @ V _R = 0.5V	typical	typical	typical	typical	Application
BB212	T092m	12V	50nA	>22.5 (V _R = 0.5V to 8V)		550pF @ 0.5V	200pF @ 3V	50pF @ 5.5V	17pF @ 8V	Matched pair of diodes, common cathode. For low voltage AM radios, LW, MW and SW bands
MV2108	T092j	30V		>2.5	24 and 30pF @ V _R = 4V	27pF @ 4V				General purpose
MVAM115	T092j	18V	100nA	<15 (V _R = 1V to 13V)	440pF and 560pF @ V _R = 1V	300pF @ 3V	150pF @ 6V	75pF @ 9V	27pF @ 15V	Electronic tuning of AM receivers

Table 15 Rectifier Diodes

Type No.	Case Style	PIV	I _F (av) A	Max V _F drop (V @ A)	Max I _R (μA @ V)
BY126	D015	650V	1A	<1.1V @ 1A	<10μA @ 650V
BY127	D015	1250V	1A	<1.1V @ 1A	<10μA @ 1250V
1N4001	D041	50V	1A	<1.1V @ 1A	<10μA @ 50V
1N4002	D041	100V	1A	<1.1V @ 1A	<10μA @ 100V
1N4003	D041	200V	1A	<1.1V @ 1A	<10μA @ 200V
1N4004	D041	400V	1A	<1.1V @ 1A	<10μA @ 400V
1N4005	D041	600V	1A	<1.1V @ 1A	<10μA @ 600V
1N4006	D041	800V	1A	<1.1V @ 1A	<10μA @ 800V
1N4007	D041	1000V	1A	<1.1V @ 1A	<10μA @ 1000V
1N5400	D027	50V	3A	<1.1V @ 3A	<10μA @ 50V
1N5401	D027	100V	3A	<1.1V @ 3A	<10μA @ 100V
1N5402	D027	200V	3A	<1.1V @ 3A	<10μA @ 200V
1N5404	D027	400V	3A	<1.1V @ 3A	<10μA @ 400V
1N5406	D027	600V	3A	<1.1V @ 3A	<10μA @ 600V
1N5407	D027	800V	3A	<1.1V @ 3A	<10μA @ 800V
1N5408	D027	1000V	3A	<1.1V @ 3A	<10μA @ 1000V
MR751	194	100V	6A	<1.1V @ 6A	<250μA @ 100V
MR754	194	400V	6A	<1.1V @ 6A	<250μA @ 400V

Table 16 Bridge Rectifiers

Type No.	Case Style	PIV	I _F (av) A	Max rms input voltage	Max capacitance load (μF)	Max V _F per diode	Max reverse current at PIV per diode
BY164	B1	60	1.4A	42V	4000μF	1.1V @ 1A	10μA
W005	B2	50	1.5A	35V	5000μF	1.1V @ 1A	10μA
W01	B2	100	1.5A	70V	2500μF	1.1V @ 1A	10μA
W02	B2	200	1.5A	140V	1250μF	1.1V @ 1A	10μA
W04	B2	400	1.5A	280V	625μF	1.1V @ 1A	10μA
S005	B3	50	2A	35V	5000μF	1.1V @ 1A	10μA
S04	B3	400	2A	280V	625μF	1.1V @ 1A	10μA
PW01	B4	100	6A	70V	5000μF	1.3V @ 3A	10μA
PW06	B4	600	6A	420V	800μF	1.3V @ 3A	10μA
J005	B4	50	10A	35V		1.1V @ 5A	10μA
J02	B4	200	10A	140V		1.1V @ 5A	10μA
J04	B4	400	10A	280V		1.1V @ 5A	10μA
K01	B5	100	25A	70V		1.2V @ 12.5A	10μA
K04	B5	400	25A	280V		1.2V @ 12.5A	10μA

Table 17 Zener Diodes

	BZY88C/BZX55C	BZX61C/BZX85C	5W ZENER	SA40A Transient Suppressor
Selection tolerance:	±5%	±5%	±5%	V _{BR} = 44.4V (min) 49.1V (max)
Max dissipation:	500mW	1.3W	5W	I _T = 1mA V _R = 40V
Case style:	D035	D035	ZD1	D015
Values available:	2.7V; 3V; 3.3V; 3.6V; 3.9V; 4.3V; 4.7V; 5.1V; 5.6V; 6.2V; 6.8V; 7.5V; 8.2V; 9.1V; 10V; 11V; 12V; 13V; 15V; 16V; 18V; 20V; 22V; 24V; 27V; 30V	4.7V; 5.1V; 5.6V; 6.2V; 6.8V; 7.5V; 8.2V; 9.1V; 10V; 11V; 12V; 13V; 15V; 16V; 18V; 20V; 22V; 24V; 27V; 30V; 33V; 36V; 39V; 43V; 47V; 51V; 56V; 62V; 68V; 75V	5.6V; (Diode marked: 5ZS5.6B or 1N5339B) 8.2V; (Diode marked: 5ZS8.2B or 1N5344B)	Max clamp V _C = 64.5V Max peak pulse I _{PP} = 7.8A Peak pulse power = 500W

Table 18 Thyristors (Silicon Controlled Rectifiers)

Type No.	Case Style	PIV	I _T (rms) A	I _T (av) A	V _{GT} (max) V	I _{GT} (max) mA	I _H (max) mA
BT149F	T092f	50V	1A	0.64A	0.8V	0.2mA	5mA
BT149M	T092f	600V	1A	0.64A	0.8V	0.2mA	5mA
C106D	P1a	400V	4A	2.5A	0.8V	0.2mA	3mA
BT109	P3b	500V	6.5A	4A	2V	10mA (min)	3mA
C116D	P1a	400V	8A	5A	1.5V	20mA	35mA
C126D	P1a	400V	12A	7.5A	1.5V	30mA	35mA

Note: In most cases, a thyristor having a higher PIV than the one specified can be used. Many thyristors use a suffix letter to indicate the PIV and the international standard is as follows:
A = 100V; B = 200V; C = 300V; D = 400V; F = 50V; M = 600V; N = 800V; P = 1000V; Y = 30V.

Table 19 Triacs (Bi-directional Silicon Controlled Rectifiers)

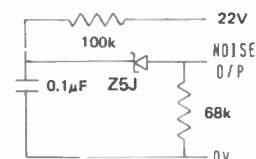
Type No.	Case Style	PIV	I _T (rms) A	V _{GT} (max) V	I _{GT} (max) mA	I _H (max) mA
C206D	P2	400V	3A	2V	5mA	30mA
2N6073	P2	400V	4A	2.5V	30mA	70mA
C226D	P2	400V	8A	2.5V	50mA	60mA
SC146D	P2	400V	10A	2.5V	50mA	75mA
C246D	P2	400V	15A	2.5V	50mA	50mA

Table 20 Diac (Bi-directional Trigger Diode) ST2

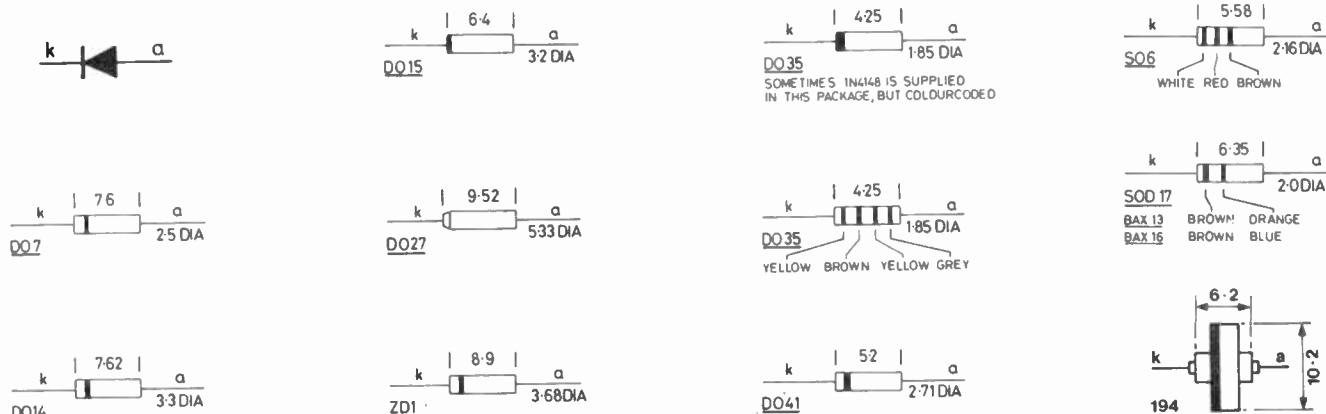
V _{BO} Breakdown voltage	32V + 4V
V _{BOII} - V _{BOIII} Breakover voltage symmetry	3V
P _{TOT} (max) Total power dissipation	150mW
I _{TRM} (max) Repetitive peak current	2A
I _{BO} (max) Breakover current	200mA
Case style	D07 or D014
Equivalents:	BR100, D32, D3202Y, GT32, MPT32, 1N5761, 133.

Table 21 Noise Generator Diode Z5J

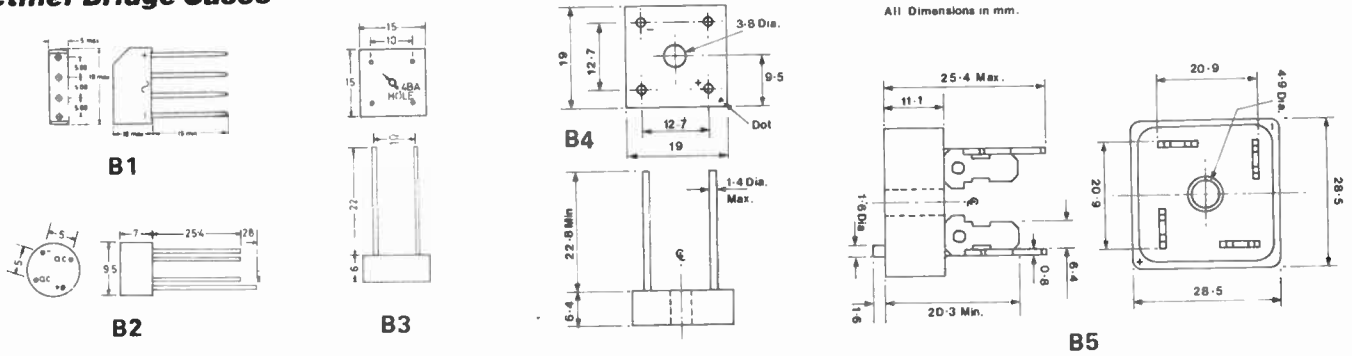
Noise output: 50mV peak to peak (min.)
Noise quality: Fine grass, no low frequency streaks.
The mean level remaining steady over the supply range 19-25V.



Diode Cases



Rectifier Bridge Cases



Transistor Cases (all viewed from below)

TO1a	TO1b	TO3v	TO3	TO5	TO5a	TO7	
TO12	TO18	TO18u	TO39	TO66	TO66t	TO66t	
TO72g	TO72c	TO72	TO72f	TO92	TO92a/k/m	TO92b	TO92c
TO92d	TO92e	TO92f	TO92g	TO92h	TO92j	TO92j	TO92j
TO98	TO106	TO106f	TO126	SO12a	SO55	SO55	SO55
E-line	C220	P1	P2	P3	P3	P3	P3

DIGITAL IC's

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Four ranges of Digital IC's are available: standard TTL, low-power LSTTL, CMOS and High Speed (HC) CMOS. For all new designs we recommend 74HC CMOS which combines the best qualities of the other ranges. It has an operating speed as high as LSTTL and power consumption similar to 4000-series CMOS.

Comparison of Digital IC Families

	74HC	CMOS	TTL	LSTTL
Power dissipation per gate (mW) static	0.0000025	0.001	10	2
at 100kHz	0.17	0.1	10	2
Propagation delay time (ns)	10	105	10	10
Maximum clock frequency (MHz)	40	12	35	40
Speed power product (pJ) at 100kHz	1.2	11	100	20
Output drive min (mA) (V _O = 0.4V)				
standard outputs	4	1.6	16	8
high-current outputs	6	1.6	48	24
Fan-out (LS loads) standard outputs	10	4	40	20
high current outputs	15	4	120	60
Input current max (mA) (V _{IN} = 0.4V)	±0.001	-0.001	-1.6	-0.4

74 and 74LS Series TTL

The newer 74LS series offers a superior performance to standard 74 series in most respects. However, both ranges are now gradually being superseded by the 74HC series. All inputs on 74 and 74LS have clamping diodes which stop voltages exceeding -1.5V, providing current into the input does not exceed -12mA (74 series) or -18mA (74LS series).

Unlike the other logic ranges, the current drawn by 74HC(T) devices from the power supply is almost directly proportional to the operating frequency. When quiescent, the current is almost 0, but at frequencies of about 5MHz and over, the current is about the same as 74LS devices.

Note: In the following, tables show only those major parameters that differ from those given in the General Parameters table, or those that permit comparison between types. Propagation delays are for load capacitances of 15pF unless stated. All values are typical at 25°C.

NAND GATES

Quad 2-Input

A range of IC's with four 2-input NAND gates in a single package. The '00' has a standard totem-pole output, whilst the '01' and '03' have open-collector (open-drain HC03) outputs. The '01' offers a different pin-out from the other TTL types. Types '26', '37' and '38' have "buffer-type" outputs permitting higher output currents. The '37' has totem-pole outputs whilst the '26' and '38' have open-collector outputs. The output of the '26' is configured for high voltages (15V max) for use as a level shifter.

A high speed 74S version of the '03' is available and there is a CMOS version available in buffered and unbuffered styles. The '00' and '03' types are also available in the 74HC series.

Note: In table where LS differs from standard types, values are shown thus: standard/LS.

74 and 74LS Types

	00	01 & 03	26	LS37	38	S03
High level output current (max)	-400µA	250µA/100µA	1mA @ 15V	-1.2mA	250µA	250µA
Low level output current (max)	16mA/8mA	16mA/8mA	16mA/8mA	24mA	48mA/24mA	20mA
Supply current avge per gate	2mA/0.4mA	2mA/0.4mA	2mA/0.4mA	0.86mA	4.88mA/0.86mA	3.25mA
Propagation delay low to high	11ns/9ns	35ns/17ns	*6ns/17ns	12ns	14ns/20ns	5ns
high to low	7ns/10ns	8ns/15ns	11ns/15ns	12ns	11ns/18ns	4.5ns

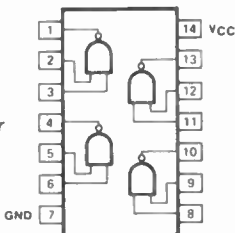
The max input currents of the 74S03 also differ from standard TTL as follows:

High level input current: 50µA
Low level input current: -2mA

CMOS and 74HC Types

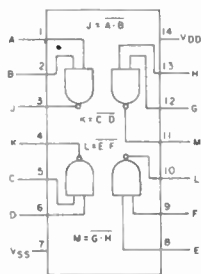
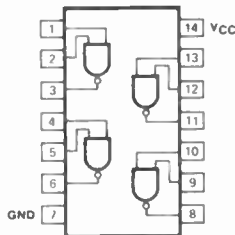
	4011BE	4011UBE	74HC00	74HC03
Propagation delay at 5V	125ns	90ns	8ns	10ns
at 10V	50ns	50ns		
at 15V	40ns	40ns		

7400, 74LS00, 74HC00 Standard
7403, 74LS03, 74S03, 74HC03 Open-collector
7426, 74LS26 High voltage buffer
74LS37 Standard buffer
7438, 74LS38 Open-collector buffer



7401, 74LS01
Open-collector

4011BE Standard
4011UBE Unbuffered



Order

QX37S (7400)	28p
YF00A (74LS00)	28p
UB00A (74HC00)	62p
QX38R (7401)	28p
YF01B (74LS01)	28p
QX74R (7403)	28p
YF03D (74LS03)	28p
QY24B (74S03)	46p
UB02C (74HC03)	62p
QX81C (7426)	46p
YF17T (74LS26)	28p
YF23A (74LS37)	28p
QX82D (7438)	46p
YF24B (74LS38)	28p
QX05F (4011BE)	23p
QL04E (4011UBE)	23p

Triple 3-Input

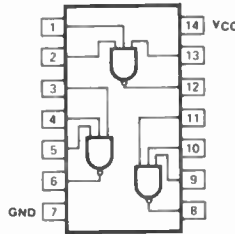
Three 3-input NAND gates in a single package, available in standard TTL, LS, CMOS and HC types. Type '10' has standard totem-pole outputs whilst the '12' has open-collector outputs.

74 and 74LS Types

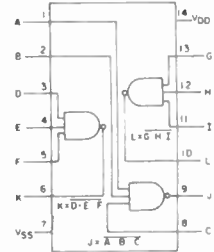
	7410	74LS10	74LS12
High level output current (max)	-400µA	-400µA	100µA
Low level output current (max)	16mA	8mA	8mA
Supply current avge per gate	2mA	0.4mA	0.42mA
Propagation delay low to high	11ns	9ns	17ns
high to low	7ns	10ns	15ns

CMOS and 74HC Types

	4023BE	74HC10
Propagation delay at 5V	160ns	10ns
at 10V	65ns	
at 15V	50ns	



7410, 74LS10, 74HC10 Standard
74LS12 Open-collector



4023BE Standard

Order

QX43W (7410)	28p
YF08J (74LS10)	28p
UB08J (74HC10)	62p
YF10L (74LS12)	28p
QX12N (4023BE)	23p

Dual 4-Input

A range of IC's with two 4-input NAND gates in a single package. Types '20' and '40' have standard totem-pole outputs whilst the '22' has open-collector outputs. Type '40' has a 'buffer-type' output permitting higher output currents. A CMOS version is available and type '20' is available in the 74HC series.

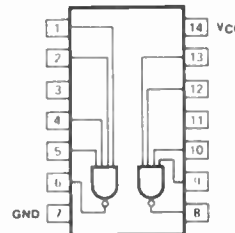
Note: In table where LS differs from standard types, values are shown thus: standard/LS.

74 and 74LS Types

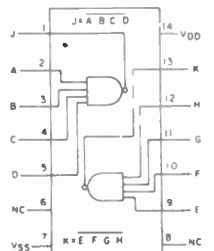
	7420	74LS22
High level output current (max)	-400µA	100µA
Low level output current (max)	16mA/8mA	8mA
Supply current avge per gate	2mA/0.4mA	0.4mA
Propagation delay low to high	12ns/8ns	17ns
high to low	8ns/10ns	15ns

CMOS and 74HC Types

	4012BE	74HC20
Propagation delay at 5V	160ns	8ns
at 10V	65ns	
at 15V	50ns	



7420, 74LS20, 74HC20 Standard
74LS22 Open-collector
7440, 74LS40 Standard Buffer



4012BE Standard

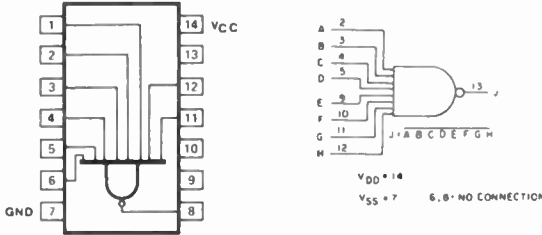
Order

QX47B (7420)	28p
YF14Q (74LS20)	28p
UB11M (74HC20)	62p
YF16S (74LS22)	28p
YF25C (74LS40)	28p
QX06G (4012BE)	23p

8-Input

One 8-input NAND gate in a 14-pin package available in standard TTL, LS, CMOS and HC types.

	7430	74LS30	4068BE	74HC30
Supply current avg per gate	2mA	0.48mA		
Propagation delay low to high/ high to low 5V	13ns/8ns	8ns/13ns	200ns	20ns
10V			60ns	
15V			60ns	



7430, 74LS30, 74HC30 Standard

4068BE Standard

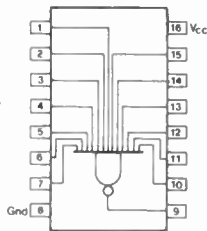
Order

QX50E (7430)	28p
YF20W (74LS30)	28p
UB14Q (74HC30)	62p
QX24B (4068BE)	23p

13-Input

One 13-input NAND gate in a 16-pin package, available in 74HC series only.

Propagation delay 5V: 20ns



74HC133 Standard

Order

UB30H (74HC133)	98p
------------------------------	------------

AND GATES

Quad 2-Input

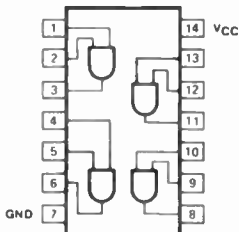
A range of IC's with four 2-input AND gates in a single package. The '08' has standard totem-pole outputs while the '09' has open-collector outputs. A CMOS version is available and type '08' is available in 74HC series.

74 and 74LS Types

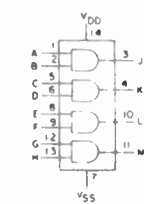
	7408	74LS08	74LS09
High level output current (max)	-800µA	-400µA	100µA
Low level output current (max)	16mA	8mA	8mA
Supply current avg per gate	3.88mA	0.85mA	0.85mA
Propagation delay low to high high to low	17.5ns 12ns	8ns 10ns	20ns 17ns

CMOS and 74HC Types

	4081BE	74HC08
Propagation delay at 5V	160ns	7ns/12ns
at 10V	65ns	(low to high/high to low)
at 15V	50ns	



7408, 74LS08, 74HC08 Standard
74LS09 Open-collector



4081BE Standard

Order

QX42V (7408)	28p
YF06G (74LS08)	28p
UB06G (74HC08)	62p
YF07H (74LS09)	28p
QW48C (4081BE)	23p

Triple 3-Input

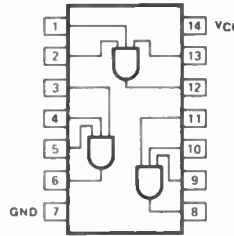
A range of IC's with three 3-input AND gates in a single package. The '11' has standard totem-pole outputs while the '15' has open-collector outputs. A CMOS version is available and type '11' is available in 74HC series.

74 and 74LS Types

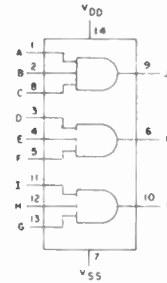
	7411	74LS11	74LS15
High level output current (max)	-800µA	-400µA	100µA
Low level output current (max)	16mA	8mA	8mA
Supply current avg per gate	3.5mA	0.85mA	0.85mA
Propagation delay low to high high to low	17.5ns 12ns	8ns 10ns	20ns 17ns

CMOS and 74HC Types

	4073BE	74HC11
Propagation delay at 5V	160ns	12ns
at 10V	65ns	
at 15V	50ns	



7411, 74LS11, 74HC11 Standard
74LS15 Open-collector



4073BE Standard

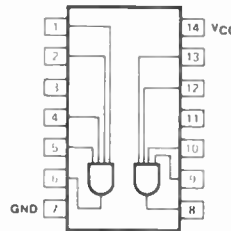
Order

QX44X (7411)	28p
YF09K (74LS11)	28p
UB09K (74HC11)	62p
YF13P (74LS15)	28p
QW44X (4073BE)	23p

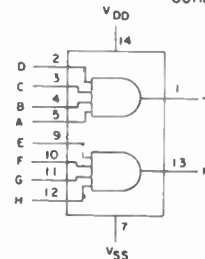
Dual 4-Input

Two 4-input AND gates in one 14-pin package available in standard TTL, LS, CMOS and HC types.

	7421	74LS21	4082BE	74HC21
Supply current avg per gate	3.5mA	0.85mA		
Propagation delay low to high/ high to low 5V	17.5ns/12ns	8ns/10ns	160ns	8ns
10V			65ns	
15V			50ns	



7421, 74LS21, 74HC21 Standard



4082BE Standard

Order

QX48C (7421)	57p
YF15R (74LS21)	28p
UB12N (74HC21)	62p
QW49D (4082BE)	23p

NOR GATES

Quad 2-Input

A range of IC's with four 2-input NOR gates in a single package. The '02' and '28' have standard totem-pole outputs while the '33' has open-collector outputs. The '28' and '33' have 'buffer-type' outputs permitting higher output currents. A CMOS version is available and type '02' is available in the 74HC series.

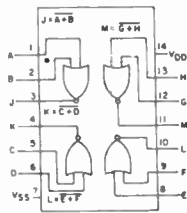
74 and 74LS Types

	7402	74LS02	74LS28	74LS33
High level output current (max)	-400µA	-400µA	-1.2mA	250µA
Low level output current (max)	16mA	8mA	24mA	24mA
Supply current avg per gate	2.75mA	0.55mA	1.09mA	1.09mA
Propagation delay low to high high to low	12ns 8ns	10ns 10ns	12ns 12ns	20ns 18ns

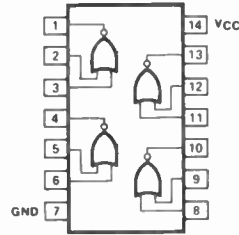
CMOS and 74HC Types

Propagation delay at 5V
at 10V
at 15V

4001BE	4001UBE	74HC02
125ns	90ns	8ns
50ns	50ns	
40ns	40ns	



7402, 74LS02, 74HC02 Standard
74LS28 Standard buffer
74LS33 Open-collector buffer



4001BE Standard
4001UBE Unbuffered

Order

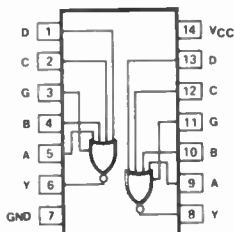
QX39N (7402)	28p
YF02C (74LS02)	28p
UB01B (74HC02)	62p
YF19V (74LS28)	28p
YF22Y (74LS33)	28p
QX01B (4001BE)	23p
QL03D (4001UBE)	23p

Dual 4-Input

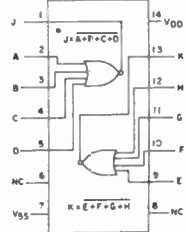
Two 4-input NOR gates in a single package available in standard TTL, CMOS and HC types.

	7425	4002BE	74HC4002
High level output current (max)	-800µA		
Supply current avge per gate	2.25mA		
Propagation delay low to high/ high to low 5V	13ns/8ns	160ns	10ns/11ns
10V		65ns	
15V		50ns	

The two gates of the 7425 may be independently strobed. The strobe input voltage levels are the same as gate inputs, but the input currents are different: 160µA for high level and -6.4mA for low level.



7425 Standard with strobe



4002BE, 74HC4002 Standard

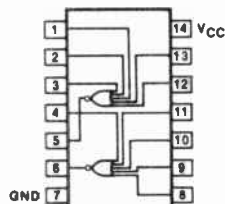
Order

QX80B (7425)	40p
QX02C (4002BE)	23p
UB97F (74HC4002)	62p

Dual 5-Input

Two 5-input NOR gates in a single package available in LSTTL only.

	74LS260
Propagation delay:	12ns
Supply current avge per gate:	1.4mA



74LS260

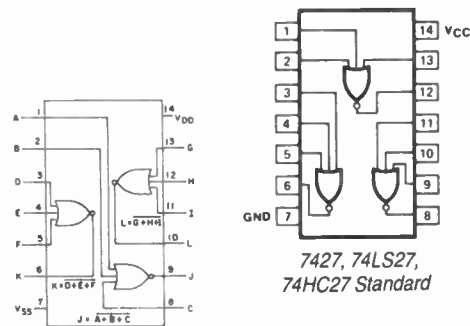
Order

QY59P (74LS260)	80p
------------------------	-----

Triple 3-Input

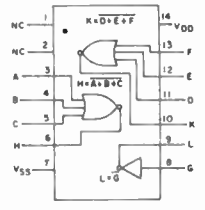
Three 3-input NOR gates in a single package available in standard TTL, LS, CMOS and HC types. In addition a second CMOS version, the 4000UBE is available, where one of the gates has been replaced with an inverter.

	7427	74LS27	4000UBE	4025BE	74HC27
High level output current (max)	-800µA	-400µA			
Supply current avge per gate	4.34mA	0.9mA			
Propagation delay low to high/ high to low 5V	10ns/7ns	10ns/10ns	115ns	160ns	8ns
10V			55ns	65ns	
15V			40ns	50ns	



7427, 74LS27,
74HC27 Standard

4025BE Standard



4000UBE Unbuffered.
Two 3-input NOR
gates and inverter.

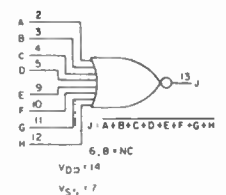
Order

QX49D (7427)	40p
YF18U (74LS27)	28p
UB13P (74HC27)	62p
QX00A (4000UBE)	23p
QX14Q (4025BE)	23p

8-Input

One 8-input NOR gate in a 14-pin package available in CMOS and HC types.

	4078BE	74HC4078
Propagation delay 5V	200ns	14ns
10V	80ns	
15V	60ns	



4078BE, 74HC4078 Standard

Order

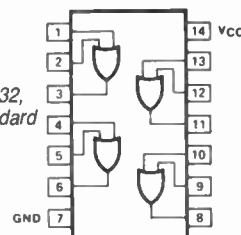
QX28F (4078BE)	28p
UF12N (74HC4078)	85p

OR GATES

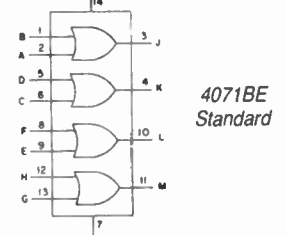
Quad 2-Input

Four 2-input OR gates in a single package available in standard TTL, LS, CMOS and HC types.

	7432	74LS32	4071BE	74HC32
High level output current (max)	-800µA	-400µA		
Supply current avge per gate	4.75mA	1mA		
Propagation delay low to high/ high to low 5V	10ns/14ns	14ns/14ns	160ns	10ns
10V			65ns	
15V			50ns	



7432, 74LS32,
74HC32 Standard



4071BE
Standard

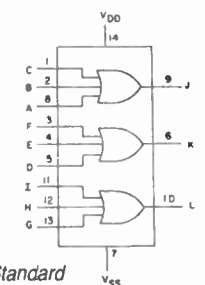
Order

QX51F (7432)	34p
YF21X (74LS32)	28p
UB15R (74HC32)	62p
QW43W (4071BE)	23p

Triple 3-Input

Three 3-input OR gates in a single package available in CMOS and HC types.

	4075BE	74HC4075
Propagation delay low to high/ high to low 5V	160ns	10ns/11ns
10V	65ns	
15V	50ns	



Order

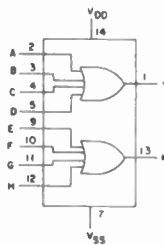
QW45Y (4075BE)	28p
UF11M (74HC4075)	85p

Dual 4-Input

Two 4-input OR gates in a single package. Available only in CMOS.

Propagation delay	5V	160ns
	10V	65ns
	15V	50ns

4072BE Standard



Order

QX27E (4072BE) 23p

COMPLEX GATES

Quad Exclusive-OR

Four 2-input exclusive-OR gates in a single package. Type '86' has standard totem-pole outputs while the '136' has open-collector outputs. CMOS and HC types are also available.

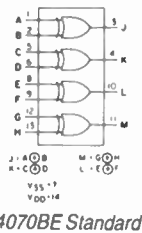
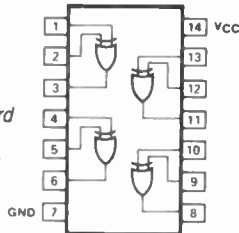
74 and 74LS Types

	7486	74LS86	74LS136
High level output current (max)	-800µA	-400µA	100µA
Supply current avge	30mA	6.1mA	6.1mA
Propagation delay low to high	18ns	20ns	18ns
high to low	13ns	13ns	18ns

CMOS and 74HC Types

	4070BE	74HC86
Propagation delay at 5V	175ns	8ns/9ns
at 10V	75ns	(low to high/high to low)
at 15V	50ns	

4070BE is a direct pin-for-pin replacement for 4030BE



7486, 74LS86,
74HC86 Standard
74LS136
Open-collector

Order

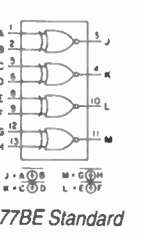
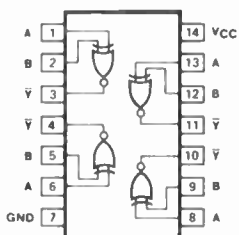
QX64U (7486) 46p
YF36P (74LS86) 40p
UB23A (74HC86) 69p
YF52G (74LS136) 51p
QX26D (4070BE) 28p

Quad Exclusive-NOR

Four 2-input exclusive-NOR gates in a single package. Available in LS, CMOS and HC types. The 74LS266 has open-collector outputs, and the 74HC266 has open drain outputs.

	74LS266	4077BE	74HC266
High level o/p current (max)	100µA		
Supply current avge	8mA		
Propagation delay at 5V	18ns	175ns	8ns/9ns
10V		75ns	(low to high/high to low)
15V		50ns	

74LS266
Open-collector
74HC266
Open-drain



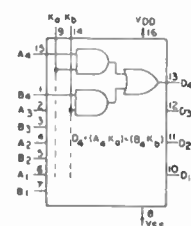
Order

YF99H (74LS266) 69p
UB71N (74HC266) 98p
QW47B (4077BE) 28p

4-Bit AND-OR Selector

A multi-function 16-pin package which may be used as a 4-bit AND-OR selector, a quad 2-channel data selector or a quad exclusive-NOR gate. With pins 9 and 14 at 0, the outputs will be 0. With pin 9 at 0 and pin 14 at 1, the level on pins 1, 3, 5, 7 will appear on pins 13, 12, 11, 10 respectively. With pins 9 and 14 both at 1, the device will perform an exclusive-NOR function.

4019BE Standard



Propagation delay at 5V:	250ns
10V:	115ns
15V:	90ns

The 4019BE is a plug-in replacement for the 4519BE in most applications.

Order

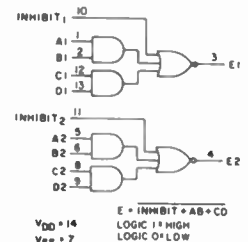
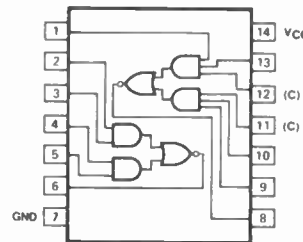
QW17T (4019BE) 40p

Dual AND-OR-invert

Two AND-OR-invert gates in a single package. The CMOS type has two identical gates both 2-wide, 2 input and each gate has an independent output inhibit pin. The LS type has one 2-wide, 2-input gate and one 2-wide, 3-input gate.

	74LS51	4085BE
Supply current avge per gate	0.55mA	
Propagation delay low to high/		
high to low 5V	12ns/12.5ns	310ns/225ns
10V		125ns/90ns
15V		90ns/65ns

(All with $C_L = 50pF$)



Order

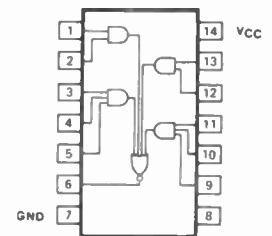
YF27E (74LS51) 28p
QW50E (4085BE) 69p

AND-OR-invert

A single AND-OR-invert gate, 4-wide with two 2-input and two 3-input gates.

Supply current avge per gate:	0.9mA
Propagation delay low to high:	12ns
high to low:	12.5ns

74LS54 Standard



Order

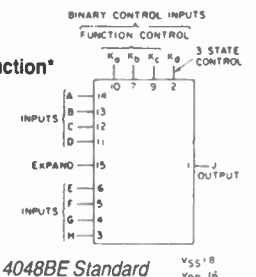
YF28F (74LS54) 28p

Multifunction Expandable 8-input

An 8-input gate having four control inputs and available only in CMOS. Three binary control inputs Ka, Kb and Kc, provide for the implementation of eight different logic functions: NOR, OR, NAND, AND, OR-NAND, OR-AND, AND-NOR and AND-OR. The fourth control input Kd, provides 3-state control. When Kd is low, the output is an open circuit and when high, the device functions normally. The Expand input enables two 4048's to be cascaded to provide a 16-input multifunction gate.

Logic Functions

Ka	Kb	Kc	Function	Expand Function*
0	0	0	NOR	OR
0	0	1	OR	OR
0	1	0	OR-AND	NOR
0	1	1	OR-NAND	NOR
1	0	0	AND	NAND
1	0	1	NAND	NAND
1	1	0	AND-NOR	AND
1	1	1	AND-OR	AND



4048BE Standard

*For expansion, the output of the first package should be connected to the expand input of the second package and the function of the first package should be set as shown. For example a 16-input NOR gate requires package one set to OR and package two set to NOR.

Propagation delay 5V:	300ns
10V:	150ns
15V:	120ns
(All with $C_L = 50pF$)	

Order

QW33L (4048BE) 57p

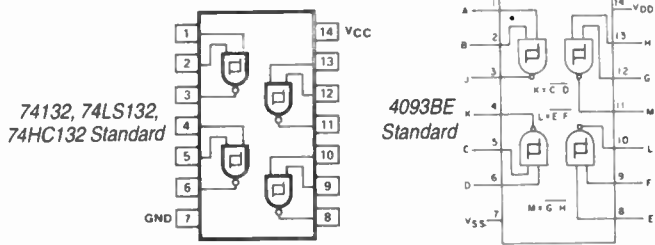
SCHMITT TRIGGERS

Quad 2-Input NAND

Four 2-input NAND Schmitt triggers in a single package, available in standard TTL, LS, CMOS and HC types.

	74132	74LS132	4093BE	74HC132
Positive going threshold voltage 5V	1.7V	1.6V	2.7V	2.9V
10V			4.43V	
15V			6.03V	
Negative going threshold voltage 5V	0.9V	0.8V	2.44V	1.7V
10V			4.05V	
15V			5.53V	
Supply current avge per gate	5.1mA	1.76mA		
Propagation delay at 5V	15ns	15ns	125ns	13ns
10V			50ns	
15V			40ns	

The high level output current (max) for 74132 is $-800\mu\text{A}$.



Order

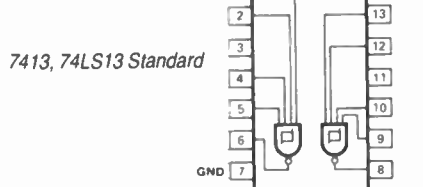
WH03D (74132)	80p
YF51F (74LS132)	69p
UB29G (74HC132)	98p
QW53H (4093BE)	28p

Dual 4-Input NAND

Two 4-input NAND Schmitt triggers in a single package, available in standard TTL and LS types.

	7413	74LS13
Positive going threshold voltage	1.7V	1.6V
Negative going threshold voltage	0.9V	0.8V
Supply current avge per gate	8.5mA	1.75mA
Propagation delay low to high	18ns	15ns
high to low	15ns	18ns

The high level output current (max) for 7413 is $-800\mu\text{A}$.



Order

QX45Y (7413)	46p
YF11M (74LS13)	40p

Hex Inverters

Six Schmitt trigger inverters in a single package, available in standard TTL, LS, CMOS and HC types.

	7414	74LS14	40106BE	74HC14
Positive going threshold voltage 5V	1.7V	1.6V	2.9V	2.8V
10V			5.9V	
15V			8.8V	
Negative going threshold voltage 5V	0.9V	0.8V	1.9V	1.7V
10V			3.9V	
15V			5.8V	
Supply current avge per gate	5.1mA	1.72mA		
Propagation delay at 5V	15ns	15ns	140ns	12ns
10V			70ns	
15V			60ns	

The high level output current (max) for 7414 is $-800\mu\text{A}$.



Order

QX46A (7414)	46p
YF12N (74LS14)	57p
UB10L (74HC14)	68p
QW64U (40106BE)	46p

HEX BUFFERS

Inverting

A range of IC's with six inverting buffers in a single package. The '04' has standard totem-pole outputs whilst the '05', '06' and '16' have open-collector outputs. In addition the '16' output can handle voltages up to 15V and the '06' up to 30V and both these devices have buffer-type outputs permitting higher output currents. The HCU04 is a unique device in the HC range as it is unbuffered and designed primarily for linear applications requiring a high input impedance amplifier and for high speed oscillators. The LS366 and LS368 devices have 3-state outputs, the LS366 has all six inverter outputs controlled from a single 2-input AND gate and the LS368, organised to facilitate the handling of 4-bit data, has four inverter outputs controlled from one input and the other two from a different input. The 4069 has standard inputs and outputs while the 4049 has high current outputs and on both the 4049 and HC4049 voltages up to 15V may be applied to the inputs regardless of the supply voltage. The 4502 has a strobe facility and 3-state outputs. The 4049 is capable of driving two TTL inputs.

74 and 74LS Types.

Note: Where LS differs from standard types, values are shown thus standard/LS.

	04	05	06	16
High level output voltage	3.4V	5.5V max	30V max	15V max
High level output current (max)	$-400\mu\text{A}$	250 μA /100 μA	250 μA	250 μA
Low level output current (max)	16mA/8mA	16mA/8mA	40mA	40mA
Supply current avge per gate	2mA/0.4mA	2mA/0.4mA	5.17mA	5.17mA
Propagation delay low to high	12ns/9ns	40ns/8ns	10ns	10ns
high to low	8ns/10ns	17ns/15ns	15ns	15ns

74 and 74LS 3-State Types

High level output current (max)	-2.6mA
Low level output current (max)	24mA
Supply current avge	12mA
Propagation delay low to high	7ns
high to low	12ns

LS366 & LS368

High level output current (max)	-2.6mA
Low level output current (max)	24mA
Supply current avge	12mA
Propagation delay low to high	7ns
high to low	12ns

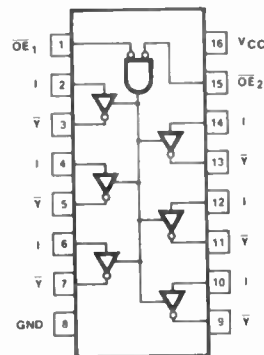
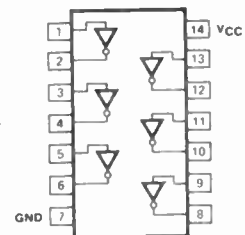
CMOS

	4049UBE	4069UBE	4502BE
High level output current (typ) 5V	-2.5mA	-0.88mA	-0.88mA
10V	-2.6mA	-2.25mA	-2.25mA
15V	-10mA	-8.8mA	-8.8mA
Low level output current (typ) 5V	6mA	0.88mA	6.6mA
10V	16mA	2.25mA	17mA
15V	40mA	8.8mA	66mA
Propagation delay low to high/			
high to low 5V	80ns/30ns	65ns	295ns/135ns
10V	40ns/15ns	40ns	130ns/55ns
15V	30ns/10ns	30ns	95ns/40ns

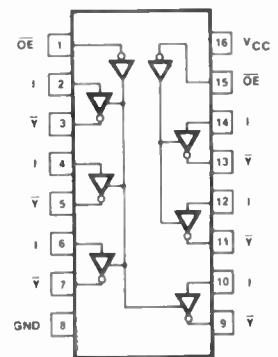
74HC

	HC04	HCU04	HC4049
Propagation delay	10ns	7ns	8ns

7404, 74LS04, 74HC04 Standard
74HCU04 Unbuffered
7405, 74LS05 Open-collectors
7406 Open-collectors, 30V Buffer
7416 Open-collector, 15V Buffer
4069UBE Unbuffered

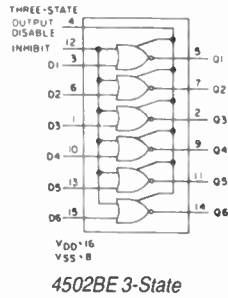
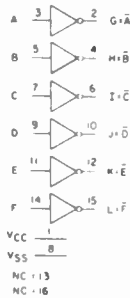


74LS366 3-State Buffer



74LS368 3-State Buffer

4049UBE Unbuffered
74HC4049 Standard



Order

QX40T (7404)	34p
YF04E (74LS04)	28p
UB03D (74HC04)	62p
UB04E (74HCU04)	68p
QX41U (7405)	34p
YF05F (74LS05)	28p
QX75S (7406)	46p
QX78K (7416)	40p
YH12N (74LS366)	57p
YH14Q (74LS368)	57p
QX21X (4049UBE)	28p
UF04E (74HC4049)	95p
QX25C (4069UBE)	23p
QW81C (4502BE)	57p

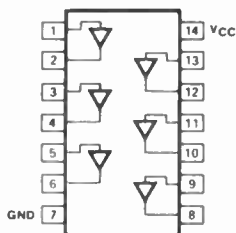
Non-Inverting

A range of IC's with six non-inverting buffers in a single package. The '07' and '17' have open-collector outputs. The '07' can handle voltages on the output up to 30V while the '17' operates up to 15V and both these devices have buffer-type outputs permitting higher output currents. The LS365 and LS367 devices have 3-state outputs, the LS365 has all six inverter outputs controlled from a single 2-input AND gate and the LS367, organised to facilitate the handling of 4-bit data, has four inverter outputs controlled from one input and the other two from a different input. The 4050 has high current outputs and on both the 4050 and HC4050 voltages up to 15V may be applied to the inputs regardless of the supply voltage. The 4503 is organised in the same way as the LS367, having two separate 3-state control inputs, one controlling four and one controlling the other two outputs.

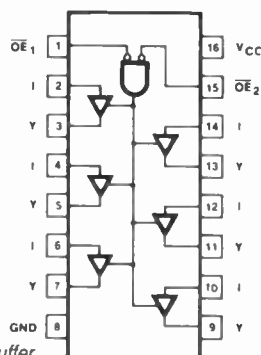
74 Types	7407	7417
High level output voltage	30V	15V
High level output current (max)	250µA	250µA
Low level output current (max)	40mA	40mA
Supply current avge per gate	4.17mA	4.17mA
Propagation delay low to high	6ns	6ns
high to low	20ns	20ns

74LS and HC 3-State Types	LS365 & LS367	HC365	HC367
High level output current (max)	-2.6mA		
Low level output current (max)	24mA		
Supply current avge	14mA		
Propagation delay low to high	10ns	15ns	13ns
high to low	9ns	15ns	13ns

CMOS and HC Types	4050BE	HC4050	4503BE
High level output current (typ) 5V	-2.5mA		-1.4mA
10V	-2.6mA		-3.7mA
15V	-10mA		-14.1mA
Low level output current (typ) 5V	6mA		2.3mA
10V	16mA		6.2mA
15V	40mA		25mA
Propagation delay low to high/			
high to low 5V	80ns/40ns	8ns	75ns
10V	40ns/20ns		35ns
15V	30ns/15ns		25ns

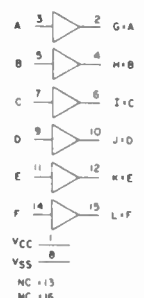
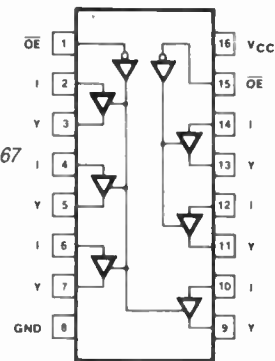


7407 Open-collector, 30V Buffer
7417 Open-collector, 15V Buffer



74LS365, 74HC365 3-State Buffer

74LS367, 74HC367
3-State Buffer
4503BE Buffer



4050BE,
74HC4050 Standard

Order

QX76H (7407)	46p
QX79L (7417)	40p
YH11M (74LS365)	57p
UB78K (74HC365)	£1.35
YH13P (74LS367)	57p
UB79L (74HC367)	£1.35
QX22Y (4050BE)	28p
UF05F (74HC4050)	95p
QQ41U (4503BE)	51p

QUAD BUFFERS 3-State

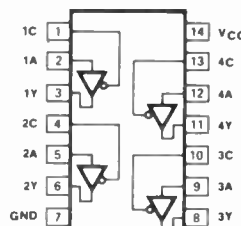
Four non-inverting buffers in a single package. Type '125' outputs are enabled when control pins are low and type '126' outputs are enabled when control pins are high. Both LS and HC types have buffer-type outputs permitting higher output currents. The 40109BE outputs are enabled when control pins are high. This device is mainly intended for use as a low-to-high voltage level shifter, the input voltages being referenced to the supply voltage on pin 1 whilst the output is standard CMOS referenced to the normal supply voltage pin 16. However, any voltage up to 15V may be connected to the inputs, pin 1 or pin 16, regardless of the supply voltages on pin 1 or pin 16.

74LS and HC Types

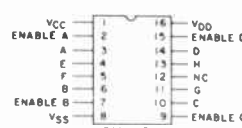
	LS125	LS126	HC125 & HC126
High level output current (max)	-2.6mA	-2.6mA	
Low level output current (max)	24mA	24mA	
Supply current avge	11mA	12mA	
Propagation delay low to high	9ns	9ns	13ns
high to low	7ns	8ns	13ns

CMOS Type 40109BE

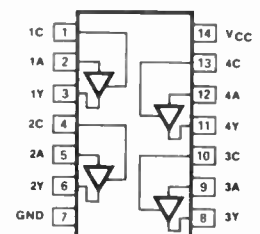
Propagation delay low to high	V _{CC}	V _{DD}	
	5V	10V	130ns
	5V	15V	120ns
	10V	15V	70ns
	10V	5V	230ns
	15V	5V	230ns
	15V	10V	80ns
high to low	5V	10V	300ns
	5V	15V	220ns
	10V	15V	180ns
	10V	5V	850ns
	15V	5V	850ns
	15V	10V	290ns



74LS125, 74HC125 3-State Buffer



40109BE Standard



74LS126, 74HC126 3-State Buffer

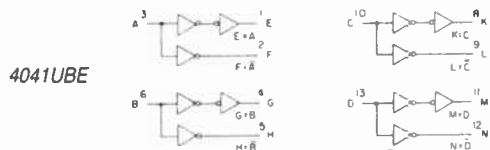
Order

YF49D (74LS125)	57p
UB27E (74HC125)	£1.20
YF50E (74LS126)	57p
UB28F (74HC126)	£1.20
QW67X (40109BE)	£1.15

True/Complement

Four buffers in a single package, each having true and complement outputs. The 4041UBE can be used as an ultra low-power resistor-network driver for A/D and D/A conversion, as a transmission-line driver and where high noise immunity and low power dissipation are primary design requirements.

	5V	10V	15V
High level output current (max)	-3.2mA	-10mA	-38mA
Low level output current (max)	3.2mA	10mA	38mA
Propagation delay	60ns	35ns	25ns



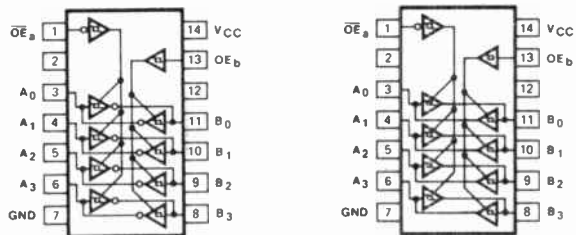
Order

QW28F (4041UBE) **63p**

Bus Transceivers

Four bus transceivers with 3-state outputs in a single package. Type '242' has inverted outputs while type '243' has non-inverted outputs. The devices are designed for asynchronous two-way communications between data buses. The output enables on pins 1 and 13 should both be high to permit data transfer from A to B and both should be low to permit data transfer from A to B. With opposite states on pins 1 and 13 (either way round) all A and B ports are made high impedance. HCT types have TTL compatible inputs (see General Parameters table). All types have buffered outputs and will drive terminated lines down to 133 ohms.

	LS243	HC/HCT242	HC/HCT243
High level output current (max)	-15mA		
Low level output current (max)	24mA		
Supply current avg	27mA		
Propagation delay	12ns	10ns	10ns



74HC242, 74HCT242 Buffer

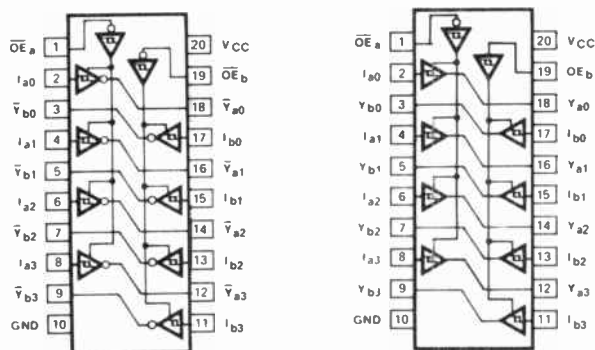
74LS243, 74HC243, 74HCT243 Buffer

Order

UB61R (74HC242)	£1.35
UB62S (74HCT242)	£2.60
YF90X (74LS243)	£1.09
UB63T (74HC243)	£1.35
UB64U (74HCT243)	£2.60

OCTAL BUFFERS Buffers and Line Drivers

A range of octal buffers. Type '240' is inverting whilst '241' and '244' are non-inverting. In these three devices, the eight buffers are divided into two groups of four with a separate output-enable input for each group. In the '240' and '244' the outputs are enabled when pins 1 and 19 are low whilst in the '241' the outputs are enabled with pin 1 low and pin 19 high. Types '540' and '541' have all eight buffers controlled from one active-low 2-input AND gate. The '540' is inverting whilst the '541' is non-inverting. All types have buffer-type outputs to permit higher output currents.



74LS240, 74HC240, 74HCT240 Buffer

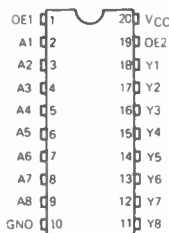
74LS241, 74HC241, 74HCT241 Buffer

74LS Types

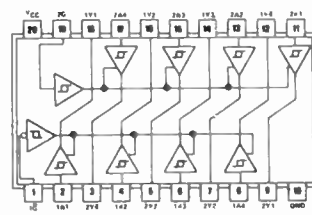
	LS240	LS241	LS244
High level output current (max)	-15mA	-15mA	-15mA
Low level output current (max)	24mA	24mA	24mA
Supply current avg	29mA	32mA	32mA
Propagation delay low to high	9ns	12ns	12ns
high to low	12ns	12ns	12ns

74HC Types

	HC(T)240	HC(T)241	HC(T)244	HC(T)540	HC(T)541
Propagation delay	10ns	20ns	20ns	12ns	14ns



74HC540, 74HCT540 Buffer
74HC541, 74HCT541 Buffer



74LS244, 74HC244, 74HCT244 Buffer

Order

YF87U (74LS240)	92p
UB57M (74HC240)	£2.20
UB58N (74HCT240)	£1.55
YF88V (74LS241)	£1.09
UB59P (74HC241)	£1.85
UB60Q (74HCT241)	£2.85
QQ56L (74LS244)	92p
UB65V (74HC244)	£1.85
UB66W (74HCT244)	£2.85
UB91Y (74HC540)	£1.95
UB92A (74HCT540)	£1.95
UB93B (74HC541)	£1.95
UB94C (74HCT541)	£3.45

Bus Transceivers

A range of octal transceivers with 3-state ports. On all types if pin 1 is low then data is transmitted from B to A and if pin 1 is high data is transmitted from A to B. If pin 19 is high all ports are put into a high impedance state. Type '245' performs a non-inverting transfer, type '640' performs an inverting transfer and type '643' performs a non-inverting transfer from B to A and an inverting transfer from A to B.

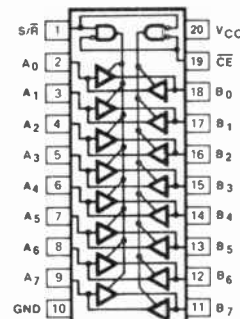
74LS245

High level output current (max)	-15mA
Low level output current (max)	24mA
Supply current avg	64mA
Propagation delay	8ns

74HC and 74HCT Types

Propagation delay (all types)	13ns
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74LS245, 74HC245, 74HCT245 Buffer
74HC640 Buffer
74HC643 Buffer



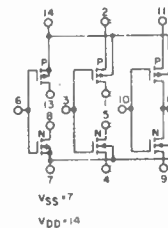
Order

YF91Y (74LS245)	£1.15
UB67X (74HC245)	£2.20
UB68Y (74HCT245)	£2.85
UB95D (74HC640)	£2.20
UB96E (74HC643)	£2.20

DUAL BUFFERS Complementary Pair Plus Inverter

This versatile IC is useful in inverter circuits, pulse shapers, linear amplifiers, high input impedance amplifiers, threshold detectors, transmission gating and functional gating.

	5V	10V	15V
Propagation delay	60ns	30ns	25ns



4007UBE

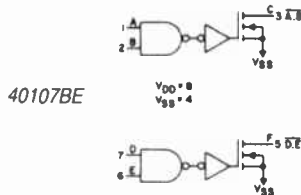
Order

QX04E (4007UBE) **23p**

Dual 2-Input NAND

A dual 2-input NAND buffer/driver containing two independent 2-input NAND buffers with open-drain single n-channel transistor outputs.

	5V	10V	15V
Low level output current (max)	32mA	74mA	100mA
Propagation delay low to high	100ns	60ns	50ns
high to low	100ns	45ns	30ns



Order

QW65V (40107BE) 63p

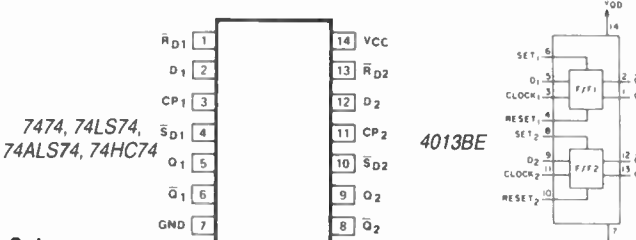
FLIP FLOPS

Dual D-Type

Two D-type positive-edge-triggered flip-flops with set (preset) and reset (clear). The data at a D-input is transferred to the Q output and the Q complement output on the next positive-going edge of the clock input.

74 Types	7474	LS74	ALS74	HC74
Max clock frequency	25MHz	33MHz	50MHz	40MHz
Propagation delay low to high	14ns	15ns	8ns	20ns
high to low	20ns	15ns	12ns	20ns
Supply current avg	17mA	4mA	2.4mA	

4013BE	5V	10V	15V
Max clock frequency	4MHz	10MHz	14MHz
Propagation delay	175ns	75ns	50ns



Order

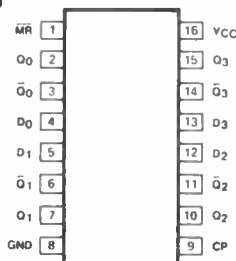
QX59P (7474)	51p
YF31J (74LS74)	40p
YY83E (74ALS74)	45p
UB19V (74HC74)	80p
QX07H (4013BE)	34p

Quad D-Type

Four D-type positive-edge-triggered flip-flops with reset (clear). The data at a D-input is transferred to the Q output and the Q complement output on the next positive-going edge of the clock input.

	74LS175	74HC175
Max clock frequency	40MHz	60MHz
Propagation delay low to high	13ns	15ns
high to low	16ns	15ns
Supply current avg	11mA	

74LS175, 74HC175



Order

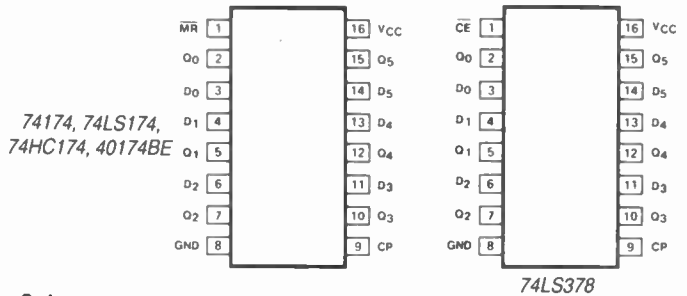
YF75S (74LS175)	80p
UB45Y (74HC175)	£1.38

Hex D-Type

Six D-type positive-edge-triggered flip-flops with reset (clear) on '174' types and common output-enable on '378' type. The data at a D-input is transferred to the Q output on the next positive-going edge of the clock input, (if enable input is low on '378').

	74174	LS174	HC174	40174BE	LS378
Max clock frequency 5V	35MHz	40MHz	60MHz	7MHz	40MHz
10V				12MHz	
15V				15.5MHz	

	74174	LS174	HC174	40174BE	LS378
Propagation delay low to high/					
high to low 5V	20ns/24ns	20ns/21ns	16ns	210ns	17ns/18ns
10V				85ns	
15V				65ns	
Supply current avg	45mA	16mA			13mA



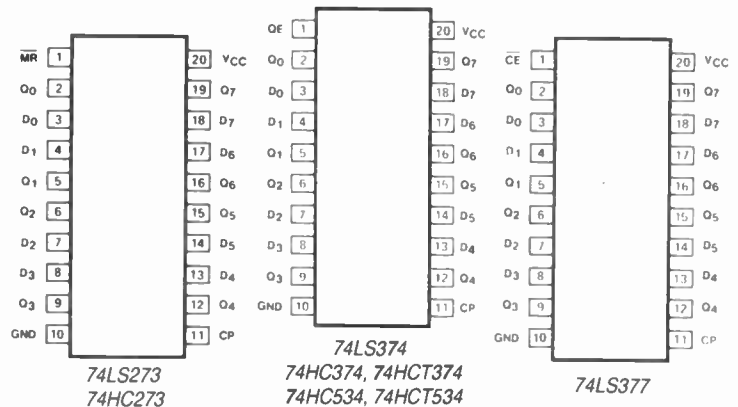
Order

WH11M (74174)	£1.26
YF74R (74LS174)	86p
UB44X (74HC174)	£1.38
QW73Q (40174BE)	86p
YH19V (74LS378)	£1.09

Octal D-Type

Eight D-type positive-edge-triggered flip-flops with reset (clear) on '273' and common output-enable on '377' type. Type '374' is non-inverting and type '534' inverting and both have 3-state outputs. The data at a D-input is transferred to the Q output on the next positive-going edge of the clock input (if enable input is low on '377') even if the chip is deselected on 3-state types.

	LS273	HC273	LS374	HC(T)374	LS377	HC(T)534
Max clock frequency	40MHz	50MHz	50MHz	65MHz	40MHz	65MHz
Propagation delay low to high	17ns	18ns	15ns	15ns	17ns	15ns
high to low	18ns	18ns	19ns	15ns	18ns	15ns
Supply current avg	17mA		27mA		17mA	

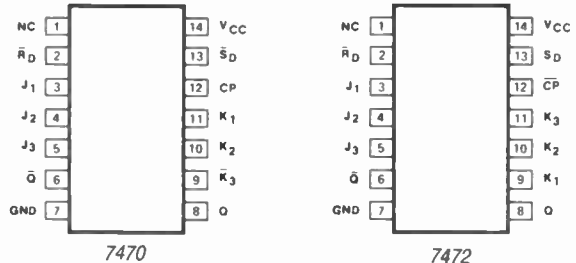


Order

YH00A (74LS273)	£1.38
UB72P (74HC273)	£2.40
YH16S (74LS374)	£1.15
UB82D (74HC374)	£1.95
UB83E (74HCT374)	£2.85
YH18U (74LS377)	£1.49
UB89W (74HC534)	£2.85
UB90X (74HCT534)	£2.85

Single J-K Type

Type '70' is an AND-gated J-K positive-edge-triggered flip-flop with preset and clear. One input to each gate is inverted and if not used must be connected to ground. Type '72' is an AND-gated J-K master-slave flip-flop with preset and clear.



	4042BE	74LS173	4076BE
Max clock frequency 5V		50MHz	3.6MHz
10V			9MHz
15V			12MHz
Propagation delay low to high/ high to low 5V	220ns	17ns/22ns	300ns
10V	90ns		125ns
15V	60ns		90ns
Supply current avge		19mA	

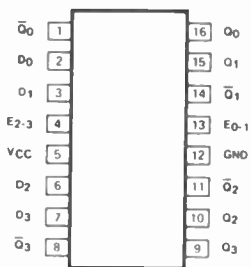
Order

QX19V (4042BE)	51p
QW46A (4076BE)	69p
YF73Q (74LS173)	£1.15

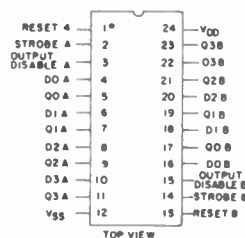
4-Bit Bistable Latches

The '75' comprises four bistable latches organised as two 2-bit and the 4508 comprises two 4-bit bistable latches. The data on the inputs is transferred to the output when pins 3 or 12 are high on the '75', and when pins 2 or 14 are high on the 4508. A low on these pins locks the data on the output. However, on the 4508, a high on pins 1 or 13 forces the outputs low. The 3-state control on the 4508, disables the output when pins 3 or 15 are high.

	7475	74LS75	74HC75	4508BE
Propagation delay D to Q low to high/high to low 5V	16ns/14ns	15ns/9ns	14ns	105ns
10V				60ns
15V				45ns
Propagation delay D to \bar{Q} low to high/high to low 5V	24ns/7ns	12ns/7ns	10ns	
Supply current avge	32mA	6.3mA		



7475, 74LS75, 74HC75 Standard



4508BE 3-State

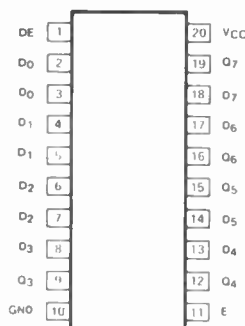
Order

QX60Q (7475)	63p
YF32K (74LS75)	51p
UB20W (74HC75)	68p
QW82D (4508BE)	£1.32

Octal D-Type Latches

Eight D-type latches in a single package. When the enable input is high, the outputs follow the inputs and when low, the outputs are latched. The outputs may be set to high impedance by applying a high to the output control pin 1. Type '533' has inverted outputs while the '373' is non-inverted.

	LS373	HC(T)373	HC(T)533
Propagation delay	12ns	13ns	13ns
Supply current	24mA		



74LS373, 74HC373, 74HC533
74HC533, 74HCT533

Order

YH15R (74LS373)	£1.15
UB80B (74HC373)	£1.95
UB81C (74HCT373)	£2.60
UB87U (74HC533)	£1.95
UB88V (74HCT533)	£2.85

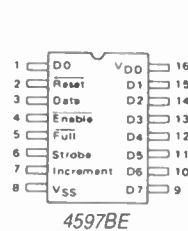
8-Bit Addressable Latches

A range of IC's each comprising eight latches any one of which may be selected by applying the appropriate address. The data is entered serially and the output is available as 8-bit parallel. In the 4099 and LS259, a write enable and reset are available, and the 4599 also has a chip enable and read/write pin since on this chip the data pin is bi-directional. The 4597 and 4598 have 3-state outputs for direct connection to an 8-bit data bus. In the 4597 a 3-bit address counter clocked on the falling edge of 'Increment', selects the appropriate latch. A full flag is provided to indicate the position of the address counter.

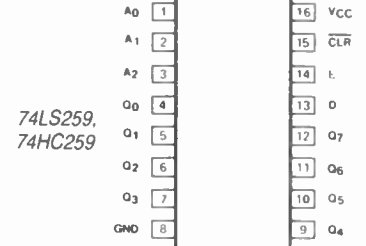
	LS259	HC259	4597/98	4099/4599
Propagation delay low to high/ high to low 5V	19ns/13ns	18ns	200ns	200ns
10V			100ns	75ns
15V			80ns	50ns

Supply current

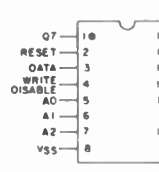
22mA



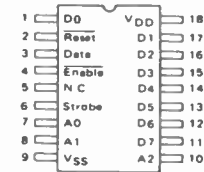
4597BE



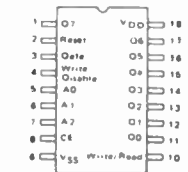
74LS259,
74HC259



4099BE



4598BE



4599BE

Order

YF97F (74LS259)	£1.42
UB70M (74HC259)	£2.60
QW57M (4099BE)	£1.26
UF20W (4597BE)	£3.75
UF21X (4598BE)	£2.85
UF22Y (4599BE)	£2.40

4 x 4 Registers

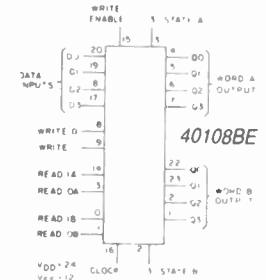
Each IC contains four 4-bit registers with separate inputs and outputs permitting simultaneous reading and writing of two different registers. The LS170 has open-collector outputs. The 40108 has two separate 4-bit outputs each allowing simultaneous independent reading.

	74LS170	40108BE
Write time	30ns	360ns 140ns 100ns
Read time	25ns	300ns 120ns 85ns
Max clock frequency		3MHz 7MHz 9MHz
Supply current	25mA	

Note: Type 40108BE is a direct pin-for-pin equivalent to 4580BE.



74LS170
Open-collector



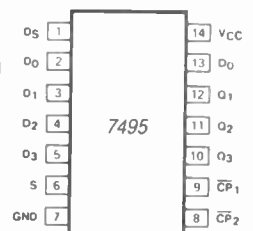
Order

YF72P (74LS170)	£1.60
QW66W (40108BE)	£3.50

SHIFT REGISTERS

4-Bit

All devices feature parallel loading or serial loading (shift right) using the D input (or J, K simultaneously on '195' and '4035'). In addition, types '95', '194', '40104' and '40194' have shift left function; types '194' and '40194' have an asynchronous master reset; types '195' and '4035' have J-K serial inputs; and types '395' and '40104' have 3-state outputs.

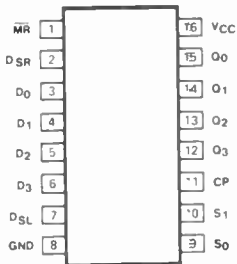


74 and 74LS Types

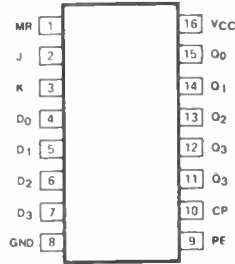
	95	194	LS194	LS195	LS395
Max clock frequency	36MHz	36MHz	36MHz	39MHz	45MHz
Propagation delay low to high	18ns	14ns	14ns	14ns	15ns
high to low	21ns	17ns	17ns	17ns	20ns
Supply current avg	39mA	39mA	15mA	14mA	22mA

CMOS and HC Types

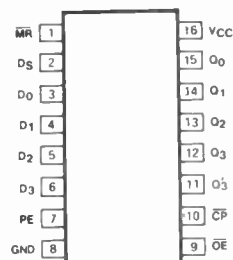
	4035	40104	40194	HC194	HC195
Max clock frequency 5V	2.5MHz	6MHz	6MHz	50MHz	45MHz
10V	6MHz	12MHz	12MHz		
15V	10MHz	15MHz	15MHz		
Propagation delay 5V	300ns	220ns	220ns	17ns	14ns
10V	130ns	100ns	100ns		
15V	95ns	70ns	70ns		



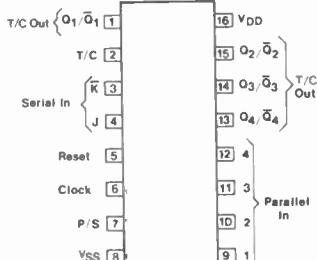
74194, 74LS194, 74HC194
40194BE



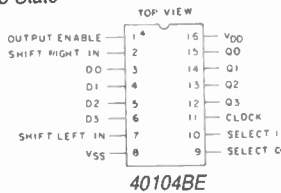
74LS195, 74HC195



74LS395 3-State



4035BE



40104BE

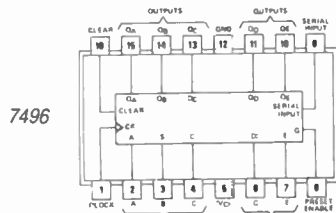
Order

QX70M (7495)	69p
WH13P (74194)	£1.15
YF82D (74LS194)	86p
UB50E (74HC194)	£1.35
YF83E (74LS195)	86p
UB51F (74HC195)	£1.35
YH23A (74LS395)	£1.26
QW25C (4035BE)	80p
QW62S (40104BE)	£1.38
QW78K (40194BE)	80p

5-Bit

The 7496 contains five set-reset master-slave flip-flops connected to perform parallel to serial or serial to parallel conversion. Parallel-in to parallel-out and serial-in to serial-out operation is also possible. Information is transferred from input to output on the positive-going edge of the clock pulse.

Propagation delay 25ns
Supply current 48mA



7496

Order

QX87U (7496)	86p
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8-Bit

The table shows the input and output configurations of the devices available.

	Serial In	Serial Out	Parallel In	Parallel Out
7491	★	★		
74164 types	★			★
74LS165	★	★	★	
74LS166	★	★	★	
4014BE	★	★	★	
4015BE	★			★
4021BE	★	★	★	
4094BE	★	★		★

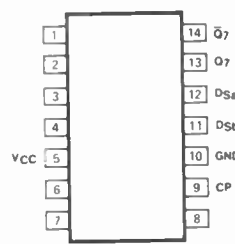
The '165' has complementary serial outputs; the '166' has a direct overriding clear; the '4094' has a 'store' function and 3-state outputs; the 4021 features asynchronous parallel loading; and the 4015 is arranged as two separate 4-bit registers.

74 and 74LS Types

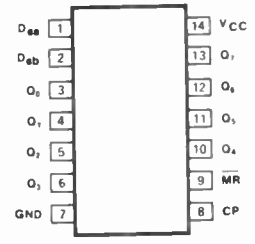
	91	164/LS164	LS165	LS166
Max clock frequency	18MHz	36MHz	35MHz	35MHz
Propagation delay low to high	24ns	17ns	14ns	14ns
high to low	27ns	21ns	16ns	11ns
Supply current avg	35mA	33mA/16mA	18mA	20mA

CMOS and 74HC Types

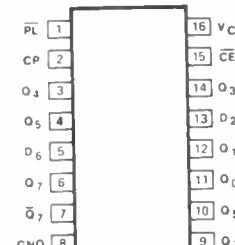
	4014	4015	4021	4094	HC164
Max clock frequency 5V	3MHz	2MHz	3MHz	2.5MHz	60MHz
10V	6MHz	6MHz	6MHz	5MHz	
15V	8MHz	7.5MHz	8MHz	6MHz	
Propagation delay 5V	400ns	310ns	400ns	420ns	19ns
10V	170ns	125ns	170ns	195ns	
15V	115ns	90ns	115ns	135ns	



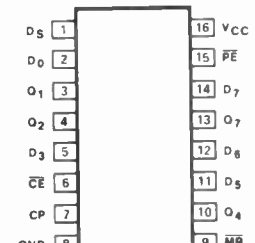
7491



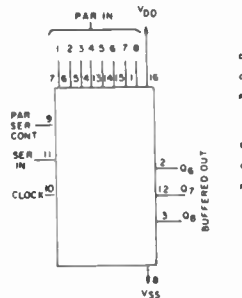
74164, 74LS164, 74HC164



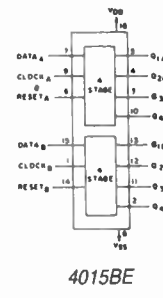
74LS165



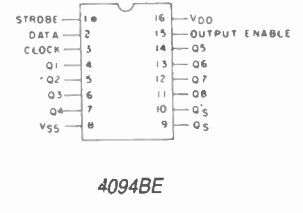
74LS166



4014BE, 4021BE



4015BE



4094BE

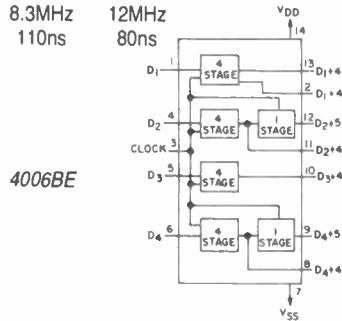
Order

QX86T (7491)	80p
WH10L (74164)	£1.26
YF67X (74LS164)	86p
UB43W (74HC164)	£1.55
YF68Y (74LS165)	£1.26
YF69A (74LS166)	£1.72
QW15R (4014BE)	57p
QW16S (4015BE)	46p
QW18U (4021BE)	63p
QW54J (4094BE)	80p

18-Bit

The 4006BE comprises four separate shift registers controlled by a common clock. Two sections have four stages and two sections have five stages with an additional output after the fourth stage. Thus it is possible by selecting appropriate stages, to make shift registers of length 4, 5, 8, 9, 10, 12, 13, 14, 16, 17 and 18 stages.

	5V	10V	15V
Max clock frequency	5MHz	8.3MHz	12MHz
Propagation delay	300ns	110ns	80ns



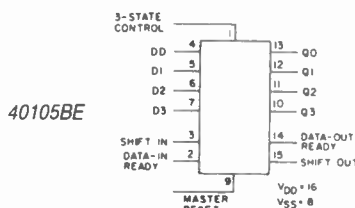
Order

QX03D (4006BE) **80p**

4-Bit x 16-Word FIFO Register

A first-in/first-out (FIFO) that can store up to sixteen 4-bit words. It can handle input and output data at different shifting rates. All input words automatically 'bubble' through to the output end where a flag 'data out ready' indicates (high) when the FIFO contains data. When the FIFO is full a second flag 'data in ready' is set low. Data is entered by applying a low to high transition on 'shift in'. The 'data in ready' pin will now go low until this word has been moved to the second position. Whilst low, transitions on 'shift in' have no effect. Data can be unloaded by applying a high to low transition to 'shift out'. The last word is dumped and the remaining data automatically bubbles through the register. The outputs are 3-state controlled from pin 1.

	5V	10V	15V
Max shift rate	3MHz	6MHz	8MHz
Ripple through delay in to out	2µs	1µs	0.7µs



Order

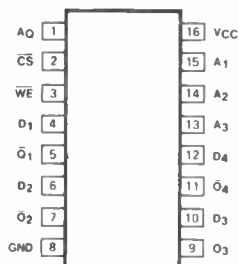
QW63T (40105BE) **£2.52**

RANDOM ACCESS MEMORY 7489

A 64-bit RAM organised as sixteen 4-bit words. The complement of the input data is stored. The outputs are open-collector.

Read time	25ns
Write time	25ns
Propagation delay	12ns
Supply current	75mA

7489 Open-collector



Order

QX65V (7489) **£2.30**

COUNTERS

Decade (and ÷ 12)

Types '90' and '196' are arranged as ÷5 and ÷2 with separate inputs and outputs and the '196' is programmable. To use them as symmetrical ÷10 counters the Q₀ output must be connected to the 'A' input on the '90' or 'clock 1' input on the '196'. The input is then applied to 'B' on the '90' or 'clock 2' on the '196' and the output is available at Q_A. The '390' and '490' are dual versions of the '90' enabling divide by any length up to 100. On the '490' the ÷2 and ÷5 counters are not available separately so symmetrical outputs are not always possible, however 'set-to-9' inputs are provided instead.

Types '160', '190' and '192' feature synchronous counting and all are programmable. The '190' and '192' will count up and down and the '192' has a dual clock and clear input. The '4510' has up-down counting capability and is programmable. The '4518' is a dual up-counter similar to the '390'.

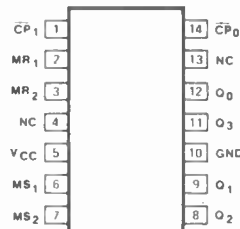
The '4017' has ten separate outputs offering a completely decoded count i.e. each output pulses sequentially repeating every 10 counts. The '4018' is presettable to ÷10, 8, 6, 4 or 2. The '92' is similar to the '90' but offers ÷12 organised as ÷6 and ÷2 with separate outputs and inputs.

74 Types	7490	7492	74160	74192
Max count frequency	42MHz	42MHz	32MHz	32MHz
Supply current avge	29mA	26mA	61mA	65mA

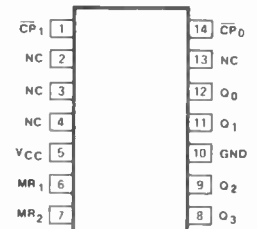
LS Types	LS90	LS92	LS160	LS190	LS192	LS196	LS390
Max count frequency	42MHz	42MHz	32MHz	25MHz	32MHz	40MHz	35MHz
Supply current avge	9mA	9mA	19mA	20mA	19mA	16mA	15mA

CMOS Types	4017BE	4018BE	4510BE	4518BE
Max count frequency 5V	5MHz	2.5MHz	3MHz	2.5MHz
10V	12MHz	6.5MHz	6MHz	6MHz
15V	16MHz	8MHz	8MHz	8MHz

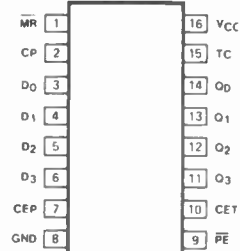
74HC Types	HC190	HC192	HC390	HC490	HC4017
Max count frequency (count down)	40MHz	27MHz	60MHz	50MHz	50MHz



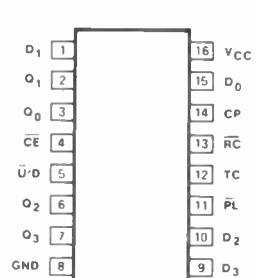
7490, 74LS90



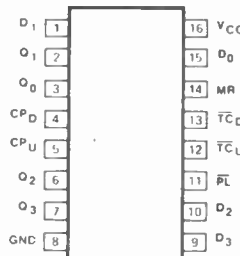
7492, 74LS92



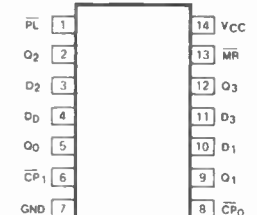
74160, 74LS160



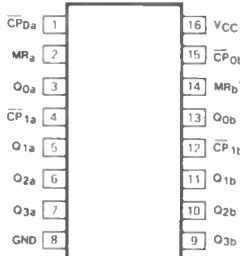
74LS190, 74HC190



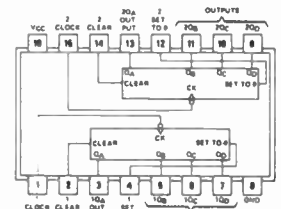
74192, 74LS192, 74HC192



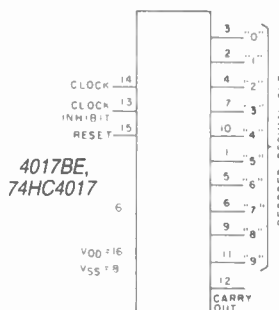
74LS196



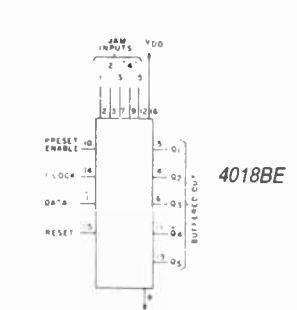
74LS390, 74HC390



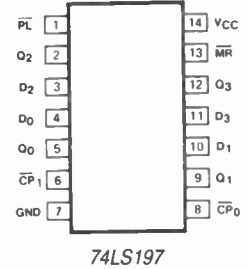
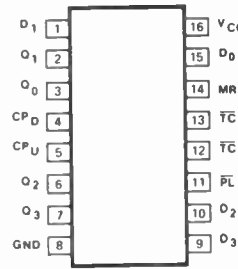
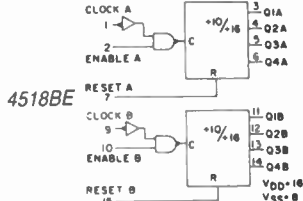
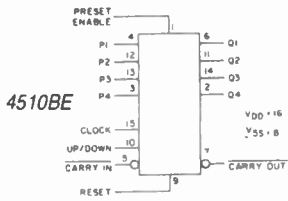
74HC490



4017BE, 74HC4017



4018BE



Order

QX66W (7490)	63p
YF38R (74LS90)	57p
QX67X (7492)	£1.26
YF39N (74LS92)	63p
WH09K (74160)	£1.15
YF63T (74LS160)	80p
YF78K (74LS190)	97p
UB46A (74HC190)	£1.80
WH12N (74192)	£1.38
YF80B (74LS192)	92p
UB48C (74HC192)	£1.80
YF84F (74LS196)	97p
YH21X (74LS390)	69p
UB84F (74HC390)	£1.60
UB86T (74HC490)	£3.95
QX09K (4017BE)	51p
UB99H (74HC4017)	£1.35
QX10L (4018BE)	63p
QW83E (4510BE)	57p
QX32K (4518BE)	57p

4-Bit Binary (and Octal)

Types '93' and '197' are arranged as ÷8 and ÷2 with separate inputs and outputs and the '197' is programmable. The '393' is a dual version of the '93'. Type '4520' also has two separate 4-bit counters. The '4022' is an octal counter with eight separate outputs offering a completely decoded count i.e. each output pulses sequentially repeating every eight counts. All other types are programmable. Type '161' is synchronous with asynchronous clear while the '163' is fully synchronous. Types '169', '191' and '193' are synchronous up-down counters, but on the '191' and '193', programming is asynchronous and the '193' has a dual clock and clear. Types '4516' and '4526' are programmable and '4516' is up-down.

74 and 74LS Types

	93	LS93	LS161	LS163	LS169
Max count frequency	42MHz	42MHz	32MHz	32MHz	35MHz
Supply current avg	26mA	9mA	19mA	19mA	28mA

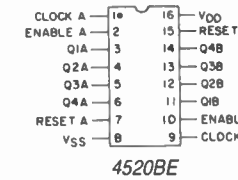
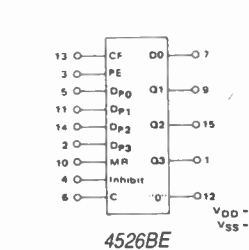
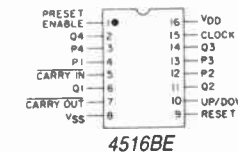
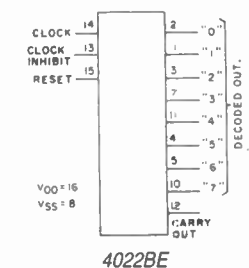
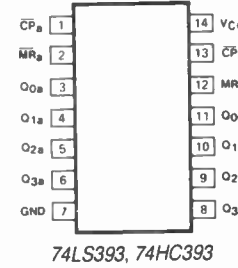
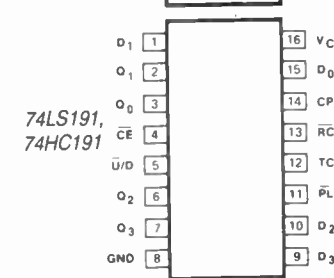
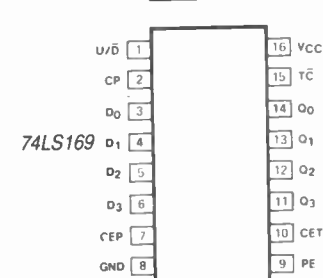
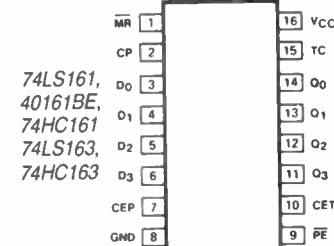
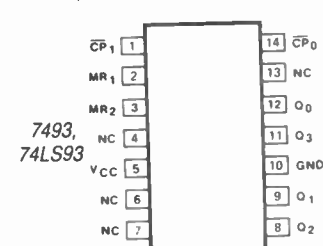
	LS191	LS193	LS197	LS393
Max count frequency	25MHz	32MHz	40MHz	35MHz
Supply current avg	20mA	19mA	16mA	15mA

CMOS Types

	4022BE	40161BE	4516BE	4520BE	4526BE
Max count frequency 5V	5MHz	2MHz	3MHz	2.5MHz	2MHz
10V	12MHz	5MHz	6MHz	6MHz	5MHz
15V	16MHz	8MHz	8MHz	8MHz	6.6MHz

74HC Types

	HC161	HC163	HC191	HC193	HC393
Max count frequency (count down)	43MHz	43MHz	40MHz	27MHz	60MHz
				31MHz	



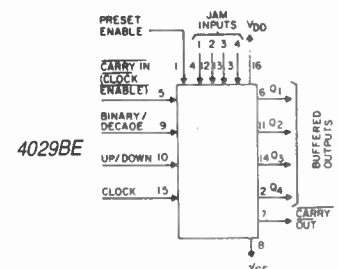
Order

QX68Y (7493)	57p
YF40T (74LS93)	63p
YF64U (74LS161)	80p
UB41U (74HC161)	£1.55
YF66W (74LS163)	80p
UB42V (74HC163)	£1.35
YF71N (74LS169)	£1.15
YF79L (74LS191)	97p
UB47B (74HC191)	£1.80
YF81C (74LS193)	92p
UB49D (74HC193)	£1.80
YF85G (74LS197)	97p
YH22Y (74LS393)	£1.15
UB85G (74HC393)	£1.95
QW19V (4022BE)	69p
QW70M (40161BE)	£2.20
QW87U (4516BE)	57p
QX33L (4520BE)	57p
QQ44X (4526BE)	80p

4-Bit Binary/Decade

An up-down counter switchable from decade to 4-bit binary. It is programmable and internally synchronous.

Max count frequency	5V	10V	15V
	4MHz	8MHz	10MHz



Order

QW20W (4029BE)	51p
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7-Stage and Higher

The following table shows the number of stages of division in each chip.

Stages	7	8	12	14	24	32
74HC292						*
4020BE/74HC4020				*		
4024BE/74HC4024	*					
4040BE/74HC4040			*			
4060BE/74HC4060				*		
40103BE		*				
4536BE					*	

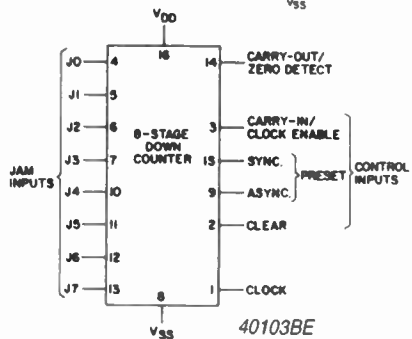
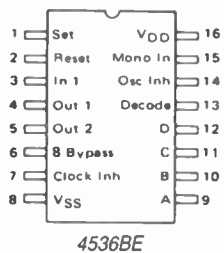
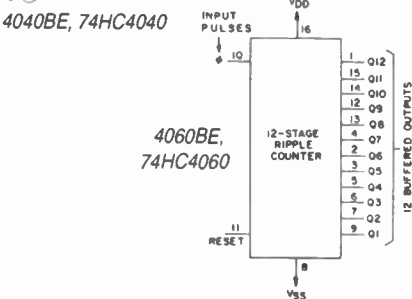
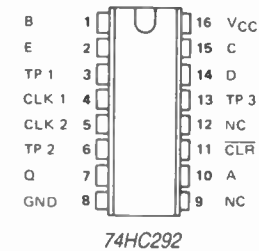
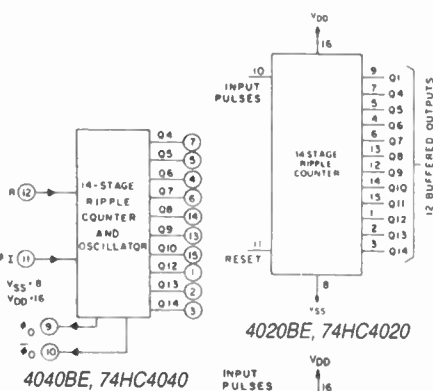
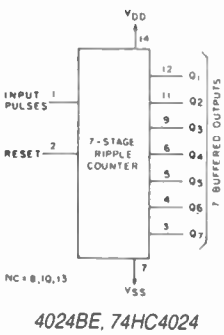
Types '40103', '74HC292' and '4536' are programmable though on the '4536' this only applies to the last 16 of the 24 stages. On types '4024', '40103' and '4040' the outputs from each stage are available individually. On the '4020' all but stages 2 and 3 are available while on the '4060' stages 1, 2, 3 and 11 are not available, but an internal oscillator is included. On the '4536' and '74HC292' only the final output is available and the '4536' includes an internal oscillator.

CMOS Types

	4020BE	4024BE	4040BE	4060BE	40103BE	4536BE
Max count frequency 5V	3.5MHz	2.5MHz	2.1MHz	5MHz	1.4MHz	1.2MHz
10V	9MHz	8MHz	7MHz	14MHz	3.6MHz	3MHz
15V	13MHz	12MHz	10MHz	17MHz	4.8MHz	5MHz

74HC Types

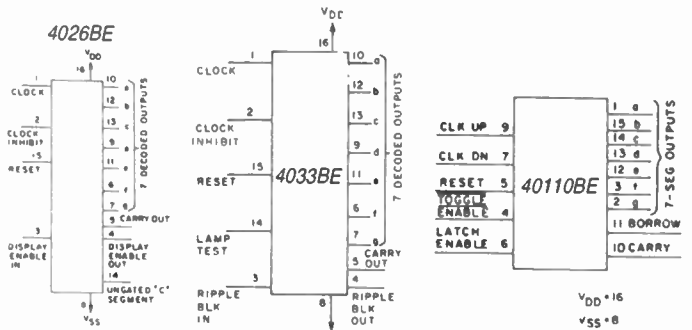
	HC292	HC4020HC	HC4024HC	HC4040	HC4060
Max count frequency	50MHz	40MHz	70MHz	40MHz	40MHz



7-Segment

All types have outputs suitable for driving seven-segment displays. Type '4026' has 'display enable input', 'display enable output', and an 'ungated c segment' output. Type '4033' is identical to the '4026' except that in place of the inputs and outputs listed above, the '4033' has a 'lamp test input', 'ripple-blanking input' and a 'ripple-blanking output'. 'Display enable' permits the count to continue whilst the display is off for power saving and in this mode the 'ungated c segment' together with 'carry' are needed for some divide functions e.g. ÷60 and ÷12. 'Ripple blanking' permits leading zeros to be extinguished in seven-segment arrays and the 'lamp test', when set high, lights all segments simultaneously. Type '40110' is an up/down counter and pins that differ from the other devices are 'borrow' (like 'carry' but operates on down counts), 'latch enable', and 'toggle enable'. Taking 'latch enable' high permits the count to continue while the display remains fixed. Taking 'toggle enable' high inhibits the count and locks the display.

	4026BE	4033BE	40110BE
Max count frequency 5V	5MHz	5MHz	2.5MHz
10V	11MHz	11MHz	5MHz
15V	16MHz	16MHz	8MHz

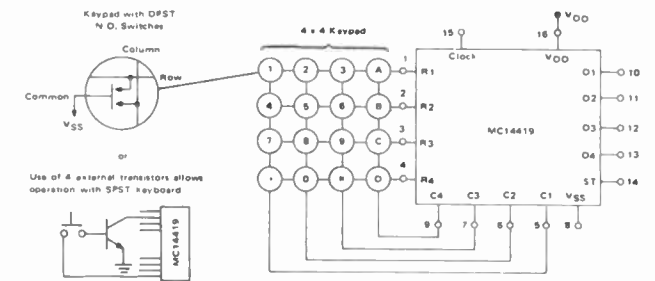


Order

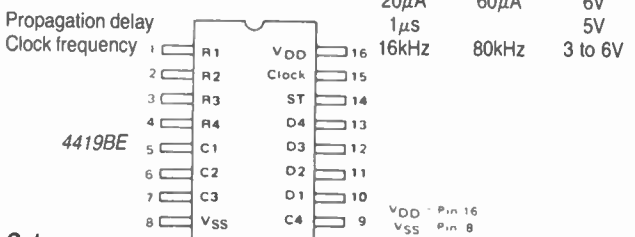
QX15R (4026BE)	£1.03
QW23A (4033BE)	£1.49
QW68Y (40110BE)	£2.70

ENCODERS Keypad to Binary

The 4419BE accepts inputs from 16 keyswitches arranged in a 4 x 4 matrix. Only one row and one column input will normally be active at any one time but if more inputs than this are active then an illegal state detector suppresses the output. For push-button telephone operation, input codes corresponding to digits 0 to 9 generate a strobe pulse while other inputs do not. Thus a pulse or tone dialler chip could be enabled by the strobe pulse whilst other codes used for other functions e.g. hold, re-dial etc., would not cause dial pulses to be generated. The strobe line does not pulse immediately and thus operates as a contact bounce suppressor. With a 16kHz clock frequency, the strobe pulse occurs 5ms after the last bounce.



	Min	Typical	Max	at V _{DD}
Supply voltage range	3V	5V	6V	
High level input voltage	3.5V	2.25V		5V
Low level input voltage	1.5V	2.25V		5V
High level output current	-0.2mA	-1.7mA		5V
Low level output current	0.2mA	0.78mA		5V
Standby supply current		1µA	3µA	3V
		5µA	15µA	5V
		20µA	60µA	6V
Propagation delay		1µs		5V
Clock frequency		16kHz	80kHz	3 to 6V



Order

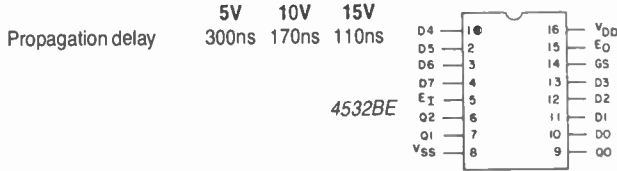
QY55K (4419BE)	£3.98
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Order

UB74R (74HC292)	Not yet available
QX11M (4020BE)	57p
UF00A (74HC4020)	£1.60
QX13P (4024BE)	39p
UF01B (74HC4024)	£1.60
QW27E (4040BE)	51p
UF02C (74HC4040)	£1.45
QW40T (4060BE)	80p
UF09K (74HC4060)	£1.20
QW61R (40103BE)	£3.95
UF23A (4536BE)	£2.85

8-Bit Priority

If E_{in} is enabled then the most significant input set (D0 to D7 – D7 is MSB) will generate a specific code at the outputs regardless of the level on any lesser significant inputs. E_{out} goes high only when E_{in} is high but all inputs are low. Group Select goes high only when E_{in} is high and one or more inputs are high.



Order

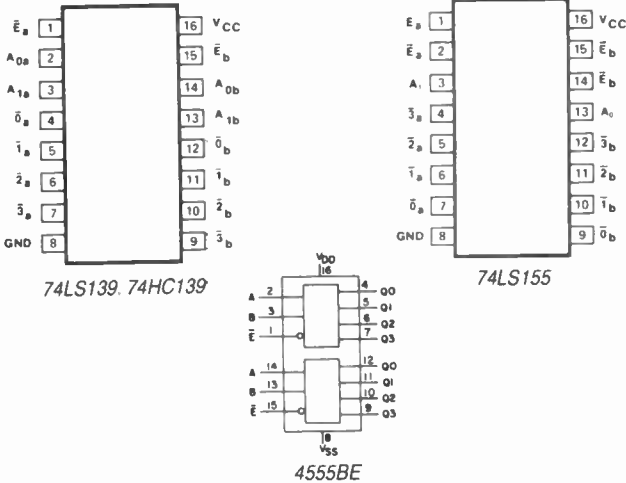
QW89W (4532BE) £1.95

DECODERS AND DEMULTIPLEXERS

Dual 2-Line to 4-Line

The '139' and '4555' each have two fully independent 2-line to 4-line decoders where a specific code on the 'select' inputs will drive one of the four outputs on (low on '139', high on '4555') providing enable is low. The enable input can be used as a data input for demultiplexing. The '155' has common 'select' inputs for the two decoders and each also has a data and strobe input. With the strobe low and a specific code on the 'select' inputs, one of the four outputs will go low only if in section 1, 'data' is high, or in section 2 only if 'data' is low. This permits use of the device as a 3-line to 8-line decoder or 1-line to 8-line demultiplexer by simply joining the two strobe inputs together and joining the two 'data' inputs together.

	LS139	HC139	LS155	4555
Propagation delay low to high/ high to low	5V	13ns/22ns	18ns	10ns/19ns
	10V			220ns
	15V			95ns
Supply current avg		6.8mA	6.1mA	60ns

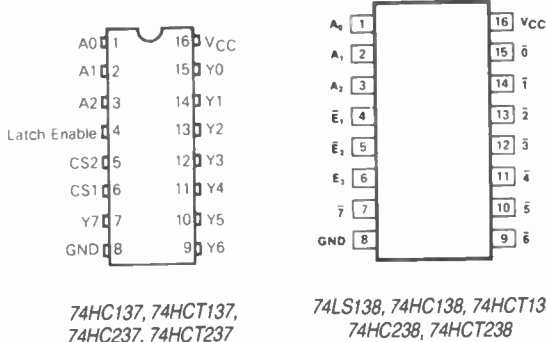


Order

YF54J (74LS139) 69p
 UB35Q (74HC139) £1.38
 YF59P (74LS155) 80p
 QW90X (4555BE) 69p

3-Line to 8-Line

Types '237' and '238' are non-inverting versions of the '137' and '138' respectively. In the '137' there are two enable inputs and an address latch, whilst in the '138' there are three enable inputs. On the '137' when pin 4 goes from low to high, the address present on the 'select' inputs is stored in the latches and



further changes ignored while pin 4 remains high. All outputs are high unless pin 6 is high and pin 5 is low. On the '138' all outputs are high unless pin 6 is high and pins 4 and 5 are low. This enables easy expansion. For demultiplexing an enable input can be used as a data input. On all devices with the chip enabled, a specific code on the three select inputs will drive one of the four outputs on (low on '137' and '138', high on '237' and '238').

	HC(T)137	LS138	HC(T)138	HC(T)237	HC(T)238
Propagation delay low to high	14ns	18ns	13ns	20ns	20ns
high to low	20ns	26ns	20ns	16ns	16ns
Supply current avg		6.3mA			

Order

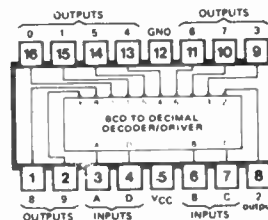
UB31J (74HC137) £1.45
 UB32K (74HCT137) £1.60
 YF53H (74LS138) 69p
 UB33L (74HC138) £1.35
 UB34M (74HCT138) £1.60
 UB53H (74HC237) £1.35
 UB54J (74HCT237) £1.20
 UB55K (74HC238) £1.45
 UB56L (74HCT238) £1.20

4-Line to 10-Line

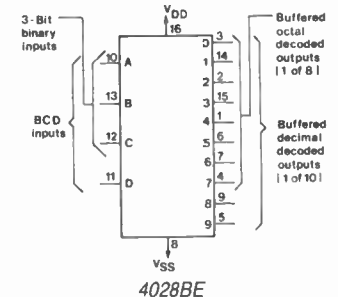
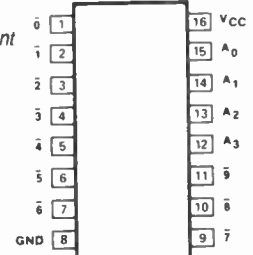
On all types a specific code between binary 0 to 9 on the 4 input lines will switch on one of the ten outputs. Binary codes 10 to 15 switch all outputs off. Type '141' offers a 60V output voltage for directly driving gas-filled cold-cathode indicating tubes, while the '145' can supply 80mA of sink current for directly driving lamps or relays.

	42	LS42	HC42	141
Off state output voltage				60V max
Off state output current				50µA @ 55V
On state output voltage				2.5V @ 7mA
Propagation delay	17ns	20ns	25ns	
Supply current avg	28mA	7mA		
		145/LS145		4028BE
Off state output voltage		15V max		
Off state output current		250µA @ 15V		
On state output voltage		0.5V @ 80mA/2.3V @ 80mA		
On state output current		80mA max		
Propagation delay 5V		50ns		300ns
	10V			130ns
	15V			90ns
Supply current avg		43mA/7mA		

7442, 74LS42, 74HC42
 74145, 74LS145 High Current



74141 High Voltage



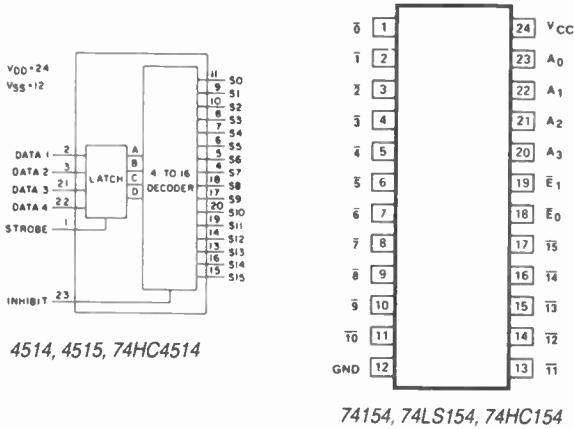
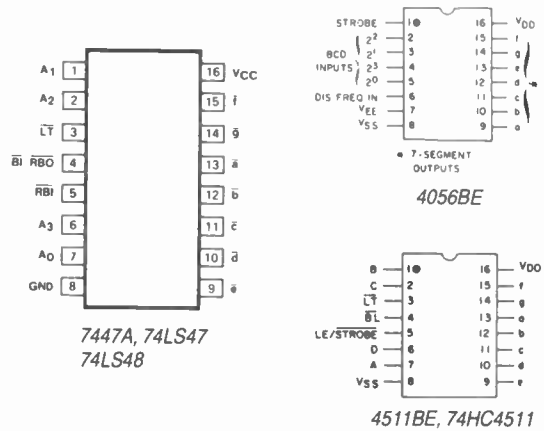
Order

QX54J (7442) 74p
 YF26D (74LS42) 57p
 UB17T (74HC42) £1.55
 WH05E (74141) 97p
 WH06G (74145) £1.15
 YF55K (74LS145) £1.09
 QX17T (4028BE) 46p

4-Line to 16-Line

On all types a specific code on the four input pins will switch one of the 16 output lines on. On type '154' there are two strobe inputs which must both be low. If one or both are high then all outputs are high. For demultiplexing operation, hold one strobe line low and connect data to the other strobe input. The outputs of the 4514 are active high, whilst on the '4515' they are active low. On the '4514' and '4515', an inhibit is provided which when high switches all outputs off. Only one strobe line is provided which when taken from high to low latches the input code. Changes on the inputs will have no effect while strobe is low. Note that two '138' IC's offer higher speed operation than one '154'.

	154	LS154	HC154	4514/4515	HC4514
Propagation delay low to high/ high to low 5V	24ns/22ns	24ns/22ns	15ns	550ns	24ns/18ns
10V				225ns	
15V				150ns	
Supply current avg	34mA	9mA			



4511BE and 74HC4511

	4511BE	74HC4511
High level output current (max)	25mA	25mA
Low level output current (max) 5V	0.88mA	25mA
10V	2.25mA	
15V	8.8mA	
High level output voltage at max current 5V	3.54V	4.2V
10V	8.75V	
15V	13.8V	
Low level output voltage at max current		1.2V

Note 4056BE is a pin-for-pin equivalent to 4543BE in most applications.

Order

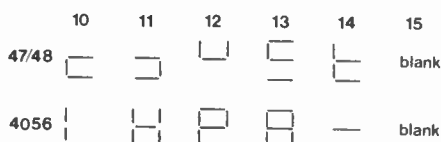
QX55K (7447A)	£1.09
QQ52G (74LS47)	92p
QQ53H (74LS48)	£1.03
QW39N (4056BE)	97p
QX31J (4511BE)	57p
UF17T (74HC4511)	£1.85

Order

WH08J (74154)	£1.49
YF58N (74LS154)	£1.78
UB38R (74HC154)	£2.35
QW85G (4514BE)	£1.32
QW86T (4515BE)	£1.32
UF18U (74HC4514)	£1.95

BCD to 7-Segment

On all types a specific code on the four input lines generates an output for driving a 7-segment display. Illegal inputs are suppressed on the '4511' and on the other IC's the display is as shown below.



Type '47' has active-low open-collector outputs for driving common anode LED displays or incandescent indicators whilst the '48' has active-high (2kΩ pull-up) outputs for driving common cathode LED displays or lamp buffers. Type '4056' is designed for driving liquid crystal displays. Type '4511' will directly drive common cathode LED's via a series resistor. 74HC4511 will directly drive common anode LED's via a series resistor as well. Types '47' and '48' have ripple blanking inputs and outputs for leading zero suppression in lamp arrays and these and the '4511' have a lamp test input which lights all segments simultaneously. Types '4056' and '4511' have a 'strobe' and 'latch enable' respectively which freezes the display regardless of changes on the input. In addition, types '47', '48' and '4511' have a display blanking input for power saving.

74 and 74LS Types

	7447A	74LS47	74LS48
Off-state o/p voltage (max)	15V	15V	
On-state output voltage	0.3V at 40mA	0.35V at 24mA	
Off-state output current	250μA	250μA	
On-state o/p current (max)	40mA	24mA	
Supply current avg	64mA	7mA	25mA

4056BE

Display frequency range 30Hz to 200Hz
 V_{EE} range 0V to -15V
 (Thus voltage across display may be from 5V to 30V)

MULTIPLEXERS

Quad 2-Line to 1-Line

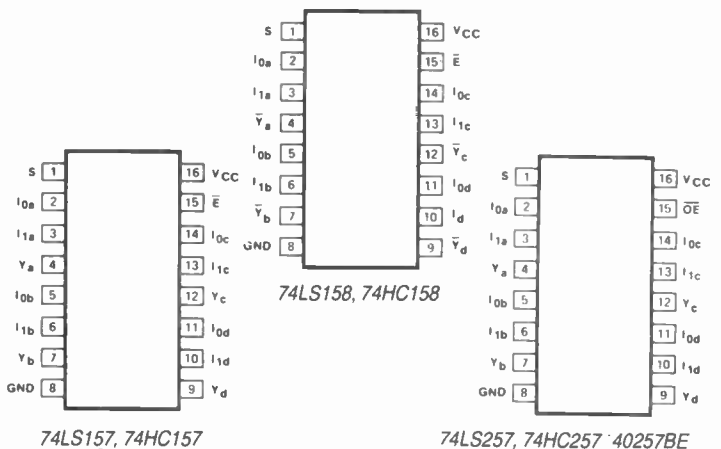
A 4-bit word is selected from one of the two sets of inputs and routed to the four outputs (or the inputs to the flip-flops on type '298') dependent on the state of the select line. Types '157', '257', '298' and '40257' present true data at the output whereas types '158' and '258' present inverted data. Types '257', '258' and '40257' have 3-state outputs controlled from pin 15, while on the '157' and '158' this pin is a strobe which must be held low for normal functioning. When high the outputs are held low on the '157' and high on the '158'. On the '298' a storage function is provided. On the negative-going edge of a clock pulse the word on the input of the flip-flops is transferred to the output.

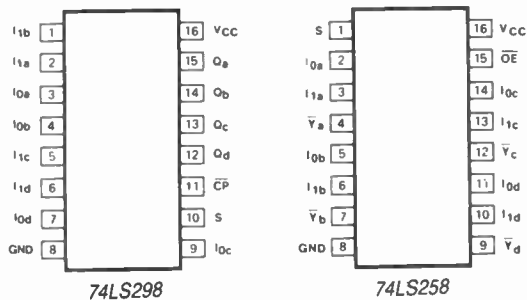
74LS Types

	LS157	LS158	LS257	LS258	LS298
Propagation delay low to high	9ns	7ns	8ns	7ns	18ns
high to low	9ns	10ns	10ns	11ns	21ns
Supply current avg	9.7mA	4.8mA	12mA	10mA	13mA

CMOS and 74HC Types

	HC157	HC158	HC257	40257BE
Propagation delay 5V	14ns	14ns	12ns	150ns
10V				70ns
15V				50ns





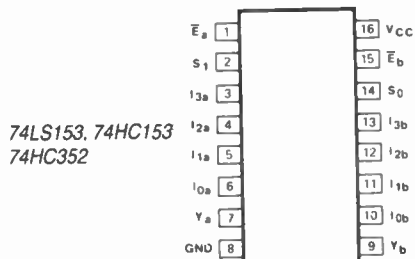
Order

74LS298	
74LS258	
YF61R (74LS157)	69p
UB39N (74HC157)	£1.35
YF62S (74LS158)	69p
UB40T (74HC158)	90p
YF95D (74LS257)	86p
UB69A (74HC257)	98p
QW79L (40257BE)	£2.25
YF96E (74LS258)	86p
YH06G (74LS298)	£1.15

Dual 4-Line to 1-Line

One of the four inputs of each of the two multiplexers is transferred to the output as selected by the two 'select' lines. On type '153' the output is true and on the '352' it is inverted. On both types a strobe is available for each multiplexer which when high forces the output off.

	LS153	HC153	HC352
Propagation delay low to high	10ns	13ns	16ns
high to low	17ns	13ns	16ns
Supply current avg	6.2mA		



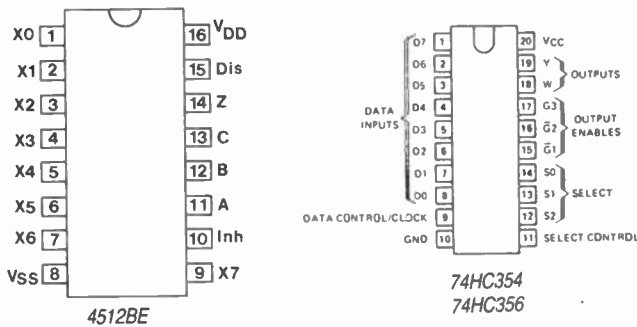
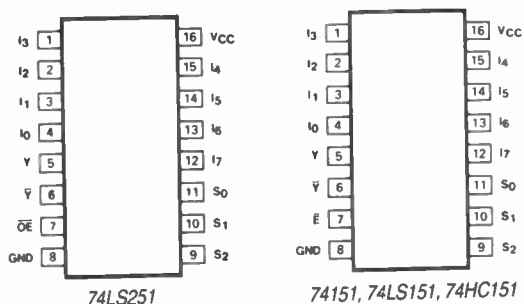
Order

74LS153, 74HC153, 74HC352	
YF57M (74LS153)	80p
UB37S (74HC153)	£1.09
UB75S (74HC352)	£1.35

8-Line to 1-Line

On all chips a specific code on the three select lines will transfer the data on one of the eight inputs to the output. All types have 'output enable' inputs and complementary outputs. Types '251', '354', '356' and '4512' have 3-state outputs, though '251' is otherwise identical to type '151'. Types '354' and '356' have latches on the 'data' and 'select' inputs. On the '354' the data latches are enabled by a low level on pin 9, whilst on the '356' the 'data' latches are clocked by a low to high transition on pin 9. The 'select' latches of both types are enabled by a low level on pin 11. The outputs are enabled when pins 15 and 16 are low and pin 17 is high. All other combinations on these three pins result in a high impedance output.

	151	LS151	HC151	LS251	HC354/6	4512
Propagation delay low to high 5V	8ns	13ns	22ns	10ns	32ns/35ns	100ns
10V						50ns
15V						40ns
high to low 5V	8ns	12ns	22ns	9ns	32ns/35ns	130ns
10V						65ns
15V						50ns
Supply current avg	29mA	6mA		6.6mA		



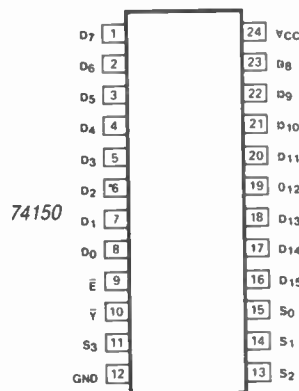
Order

4512BE	
74HC354, 74HC356	
WH07H (74151)	69p
YF56L (74LS151)	80p
UB36P (74HC151)	98p
YF92A (74LS251)	86p
UB76H (74HC354)	£4.95
UB77J (74HC356)	£4.95
QW84F (4512BE)	57p

16-Line to 1-Line

The 74150 has 16 data inputs and depending on the code on the four select lines, one of these inputs is transferred to the output. The strobe line must be held low for normal operation. When high, the output is locked high.

Propagation delay	8ns
Supply current	40mA



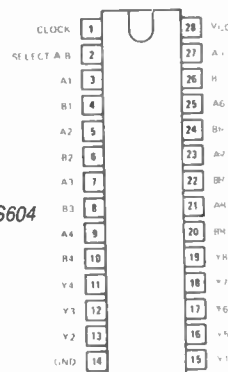
Order

74150	
QX89W (74150)	£1.95

16-Line to 8-Line

The 74LS604 has inputs for two separate eight bit data buses and one 8-bit output. Data from data bus A is loaded into the device on a positive-going transition of the clock when the select line is high and data bus B is loaded when the select line is low. When the clock is high the output contains the data in the A register if select is high or the B register if select is low. When the clock is low, the outputs are high impedance.

Propagation delay low to high	31ns
high to low	19ns
Supply current avg	55mA



Order

74LS604	
QY42V (74LS604)	£4.95

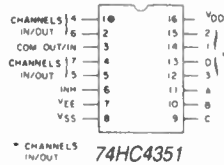
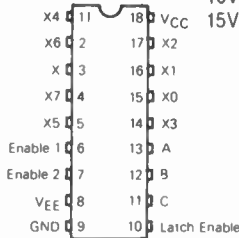
★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

ANALOGUE SWITCHES

1-Pole 8-Way

A bi-directional 8-way switch where any one of 8 signals will be connected to a common pin depending on the code on the three control pins. No switch is made if the inhibit pin is high on the '4051'. On the '4351' pin 6 must be low and pin 7 high for any switch to be on. The '4351' contains a latch for the 'channel select' data. When 'latch enable' is low, the switches cannot change state regardless of changes on the 'channel select' pins. Analogue signals with peak-to-peak voltages up to the difference between V_{DD}/V_{CC} and V_{EE} may be transmitted through the switch. Note that V_{EE} must not be connected to a voltage higher than V_{SS}/Ground . For analogue signals it is usually preferable to make V_{EE} equal in magnitude to V_{DD} e.g. $V_{DD}/V_{CC} = 5V, V_{EE} = -5V$.

	V_{DD}/V_{CC} to V_{EE}	4051BE	74HC4051	74HC4351
Supply voltage range (V_{DD}/V_{CC})		3V to 15V	2V to 6V	2V to 6V
Supply voltage range (V_{EE})		0 to -10V	0V to -6V	0V to -6V
Max difference V_{DD}/V_{CC} to V_{EE}		15V	12V	12V
On resistance	5V	250Ω	40Ω	40Ω
	10V	120Ω	30Ω	30Ω
	15V	80Ω		
Matching of on resistances	5V	25Ω	10Ω	10Ω
	10V	10Ω	5Ω	5Ω
	15V	5Ω		
Leakage current any off channel	max	±0.01nA	20nA	20nA
Propagation delay in to out	5V	35ns	5ns	5ns
	10V	15ns	4ns	4ns
	15V	12ns		
Max switch turn on delay	5V	360ns	18ns	18ns
	10V	160ns	16ns	16ns
	15V	120ns		
Max switch turn off delay	5V	350ns	28ns	20ns
	10V	170ns	18ns	18ns
	15V	140ns		
Sine wave distortion	10V	0.04%		
Bandwidth	10V	20MHz	120MHz	120MHz
Max current through switch	5V	14.3mA	25mA	25mA
	10V	25mA	25mA	25mA
	15V	25mA		



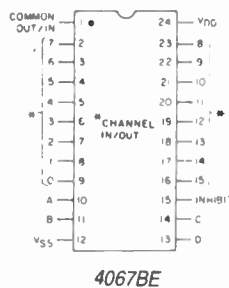
Order

QW34M (4051BE)	57p
UF06G (74HC4051)	Not yet available
UF14Q (74HC4351)	Not yet available

1-Pole 16-Way

A bi-directional switch where any one of 16 signals will be connected to a common pin depending on the level on the four control pins. No switch is made if the inhibit pin is high. Voltages up to +15V may be transmitted through the switch. For analogue signals, V_{DD} and V_{SS} may be set at equal magnitudes up to $V_{DD} = +7.5V, V_{SS} = -7.5V$.

	V_{DD}	4067BE
On resistance	5V	250Ω
	10V	120Ω
	15V	80Ω
Matching of on resistance	5V	25Ω
	10V	10Ω
	15V	5Ω
Leakage current any off channel	15V	±0.01nA
Propagation delay in to out	5V	35ns
	10V	15ns
	15V	12ns
Max switch turn on delay	5V	240ns
	10V	115ns
	15V	75ns
Max switch turn off delay	5V	150ns
	10V	120ns
	15V	75ns
Sine wave distortion	10V	0.3%
Bandwidth	10V	15MHz
Max current through switch	5V	14.3mA
	10V	25mA
	15V	25mA



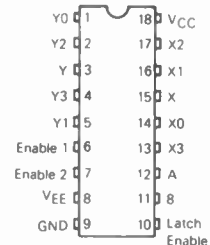
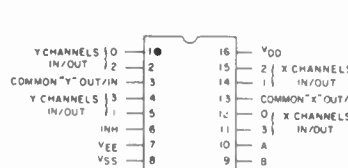
Order

QW42V (4067BE)	£2.64
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2-Pole 4-Way

Two separate bi-directional 4-way switches in one package where any one of 4 signals will be connected to a common pin depending on the code on the two control pins. No switch is made if the inhibit pin is high on the '4052'. On the '4352' pin 6 must be low and pin 7 high for any switch to be on. The '4352' contains a latch for the 'channel select' data. When 'latch enable' is low, the switches cannot change state regardless of changes on the 'channel select' pins. Analogue signals with peak-to-peak voltages up to the difference between V_{DD}/V_{CC} and V_{EE} may be transmitted through the switch. Note that V_{EE} must not be connected to a voltage higher than V_{SS}/Ground . For analogue signals it is usually preferable to make V_{EE} equal in magnitude to V_{DD} e.g. if $V_{DD}/V_{CC} = 5V$ then make $V_{EE} = -5V$.

	V_{DD}/V_{CC} to V_{EE}	4052BE	74HC4052	74HC4352
Supply voltage range (V_{DD}/V_{CC})		3V to 15V	2V to 6V	2V to 6V
Supply voltage range (V_{EE})		0 to -10V	0V to -6V	0V to -6V
Max difference V_{DD}/V_{CC} to V_{EE}		15V	12V	12V
On resistance	5V	250Ω	40Ω	40Ω
	10V	120Ω	30Ω	30Ω
	15V	80Ω		
Matching of on resistances	5V	25Ω	10Ω	10Ω
	10V	10Ω	5Ω	5Ω
	15V	5Ω		
Leakage current any off channel	max	±0.01nA	20nA	20nA
Propagation delay in to out	5V	30ns	5ns	5ns
	10V	12ns	4ns	4ns
	15V	10ns		
Max switch turn on delay	5V	325ns	18ns	18ns
	10V	130ns	16ns	16ns
	15V	90ns		
Max switch turn off delay	5V	350ns	28ns	20ns
	10V	170ns	18ns	18ns
	15V	140ns		
Sine wave distortion	10V	0.04%		
Bandwidth	10V	30MHz	120MHz	120MHz
Max current through switch	5V	14.3mA	25mA	25mA
	10V	25mA	25mA	25mA
	15V	25mA		

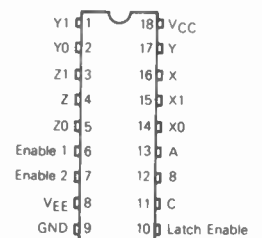
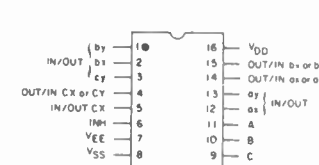


Order

QW35Q (4052BE)	57p
UF07H (74HC4052)	£2.40
UF15R (74HC4352)	Not yet available

3-Pole 2-Way

Three separate bi-directional 2-way switches in one package where either of two signals will be connected to a common pin depending on the level on the control wire for that 2-way switch. 'Select' pin A controls switch X0, X1, pin B controls Y0, Y1 and pin C controls Z0, Z1. When the select wire is low the 0 input is connected to the common (X, Y or Z) and when high the 1 input. No switch is made if the inhibit pin is high on the '4053'. On the '4353' pin 6 must be low and pin 7 high for any switch to be on. The '4353' contains a latch for the 'channel select' data. When 'latch enable' is low, the switches cannot change state regardless of changes on the 'channel select' pins. Analogue signals with peak-to-peak voltages up to the difference between V_{DD}/V_{CC} and V_{EE} may be transmitted through the switch. Note that V_{EE} must not be connected to a voltage higher than V_{SS}/Ground . For analogue signals it is usually preferable to make V_{EE} equal in magnitude to V_{DD} e.g. if $V_{DD}/V_{CC} = 5V$ then make $V_{EE} = -5V$.



	V_{DD}/V_{CC} to V_{EE}			
	4053BE	74HC4053	74HC4353	
Supply voltage range (V_{DD}/V_{CC})	3V to 15V	2V to 6V	2V to 6V	
Supply voltage range (V_{EE})	0 to -10V	0V to -6V	0V to -6V	
Max difference V_{DD}/V_{CC} to V_{EE}	5V	250Ω	40Ω	40Ω
On resistance	10V	120Ω	30Ω	30Ω
	15V	80Ω		
Matching of on resistances	5V	25Ω	10Ω	10Ω
	10V	10Ω	5Ω	5Ω
	15V	5Ω		
Leakage current any off channel	max	±0.01nA	20nA	20nA
Propagation delay in to out	5V	25ns	5ns	5ns
	10V	8ns	4ns	4ns
	15V	6ns		
Max switch turn on delay	5V	300ns	18ns	18ns
	10V	120ns	16ns	16ns
	15V	80ns		
Max switch turn off delay	5V	275ns	28ns	20ns
	10V	140ns	18ns	18ns
	15V	110ns		
Sine wave distortion	10V	0.04%		
Bandwidth	10V	55MHz	120MHz	120MHz
Max current through switch	5V	14.3mA	25mA	25mA
	10V	25mA	25mA	25mA
	15V	25mA		

Order

QW36P (4053BE)	69p
UF08J (74HC4053)	Not yet available
UF16S (74HC4353)	Not yet available

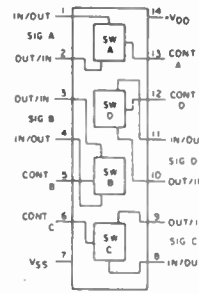
4-Pole 1-Way

Four separate bi-directional off/on switches in one package each with its own control input. A switch is off with its control wire at low level and on at high level. For analogue signals, V_{DD} and V_{SS} may be set at equal magnitudes up to $V_{DD} = +7.5V$, $V_{SS} = -7.5V$ for CMOS 'BE' types and up to $\pm 6V$ for 74HC (V_{DD} to V_{EE} on '4316'). Types '4016' and '4416' are identical except that the '4416' control switches B and C are on when their control lines are off and vice-versa. Thus the 4416BE may be easily used as a DPDT switch. Type '4066' has a lower 'on' resistance than '4016' and '4416' types, but type '4016' is recommended for sample and hold circuits. Type '4316' has a separate analogue voltage supply V_{EE} which must be connected to a voltage not higher than Ground. This device also has an enable input which when taken high, disables all the switches regardless of the condition on their control lines.

CMOS 'BE' Types

	V_{DD}	V_{SS}	4016/4416BE	4066BE
On resistance ($R_L = 10k$)	5V	0V	580Ω	250Ω
	5V	-5V	250Ω	120Ω
	2.5V	-2.5V	520Ω	250Ω
	7.5V	-7.5V	200Ω	80Ω
	10V	0V	250Ω	120Ω
	15V	0V	200Ω	80Ω
Matching of on resistances	5V	-5V	15Ω	10Ω
	7.5V	-7.5V	10Ω	5Ω
Leakage current any off channel	7.5V	-7.5V	±1.5nA	±0.01nA
Propagation delay in to out	5V	0V	15ns	20ns
	10V	0V	7ns	10ns
	15V	0V	6ns	7ns
Crosstalk between any 2 switches	5V	0V	-80dB @ 1MHz	-50dB @ 8MHz
Maximum control frequency	5V	0V	5MHz	6MHz
	10V	0V	10MHz	8MHz
	15V	0V	12MHz	8.5MHz
Max switch turn on/off delay	5V	0V	34ns	40ns
	10V	0V	20ns	35ns
	15V	0V	15ns	30ns
Sine wave distortion	5V	-5V	0.16%	0.1%
Bandwidth	5V	-5V	54MHz	65MHz
Max current through switch	5V	-5V	8mA	25mA
	7.5V	-7.5V	10mA	25mA
	10V	0V	8mA	25mA
	15V	0V	10mA	25mA
	5V	0V	3.2mA	14.3mA
	2.5V	-2.5V	3.3mA	14.3mA

Caution: Types 4016BE and 4416BE do not include static protection circuitry on their inputs. Extreme care must be taken when handling these devices.



4016BE, 74HC4016
4066BE, 74HC4066
4416BE

74HC Types

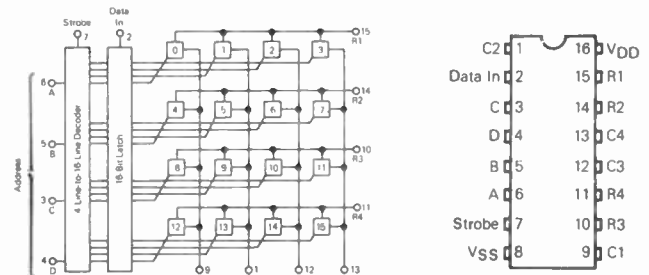
	V_{DD} to Gnd/V_{EE}	74HC4016	74HC4066	74HC4316
Supply voltage range (V_{CC} to Gnd)		2V to 12V	2V to 12V	2V to 6V
Supply voltage range (V_{EE} to Gnd)				0V to -6V
On resistance	2V	120Ω	200Ω	200Ω
	5V	50Ω	50Ω	50Ω
	9V	35Ω	20Ω	20Ω
	12V	20Ω	15Ω	15Ω
Matching of on resistances	5V	10Ω	10Ω	Ω
	9V	5Ω	5Ω	5Ω
	12V	5Ω	5Ω	5Ω
Leakage current any off channel	5V	10nA	10nA	10nA
	9V	15nA	15nA	
	12V	20nA	20nA	10nA
Propagation delay in to out	2V	25ns	25ns	25ns
	5V	5ns	5ns	5ns
	9V	4ns	4ns	4ns
	12V	3ns	3ns	3ns
Max switch turn on delay	2V	32ns	32ns	32ns
	5V	8ns	8ns	8ns
	9V	6ns	6ns	6ns
	12V	5ns	5ns	5ns
Max switch turn off delay	2V	45ns	45ns	45ns
	5V	15ns	15ns	15ns
	9V	10ns	10ns	10ns
	12V	8ns	8ns	8ns
Bandwidth	5V	100MHz	100MHz	100MHz
	9V	120MHz	120MHz	120MHz
Max current through switch	Any	25mA	25mA	25mA

Order

QX08J (4016BE)	28p
UB98G (74HC4016)	£5.50
QX23A (4066BE)	50p
UF10L (74HC4066)	£1.85
QX30H (4416BE)	£2.95
UF13P (74HC4316)	Not yet available

Crosspoint 45100BE

16 Crosspoint bi-directional switches organised in four rows and four columns. To turn a switch on or off, apply the appropriate code to address pins A, B, C, and D e.g. for switch 15, apply binary 15 where A is LSD and D is MSD. At the same time pulse 'strobe' high and if 'data in' is also high, the switch will turn on. If 'data in' is low the switch will turn off. In addition turning on one switch will automatically turn off all others in that row e.g. switching switch 5 on will turn off switches 4, 6 and 7. Analogue signals with peak-to-peak voltages up to the difference between V_{DD} and V_{SS} may be transmitted through the switches. For analogue signals it is usually preferable to make V_{DD} and V_{SS} equal magnitudes up to $V_{DD} = +7.5V$, $V_{SS} = -7.5V$.



45100BE

	V_{DD}	45100BE
On resistance	5V	250 Ω
	10V	110 Ω
	15V	85 Ω
Matching of on resistances	5V	25 Ω
	10V	15 Ω
	15V	15 Ω
Leakage current any off channel	15V	$\pm 0.4nA$
Propagation delay in to out	5V	30ns
	10V	15ns
	15V	10ns
Crosstalk between any two switches @ 100Hz		-110dB
Sinewave distortion	10V	0.5%
Bandwidth	10V	15MHz
Max current through switch		25mA

Order

QQ51F (45100BE) £2.95

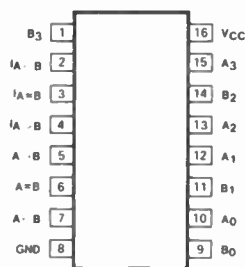
COMPARATORS

4-Bit

Four-bit magnitude comparators that determine whether the binary code on the four 'A' inputs is greater than, equal to, or smaller than the binary code on the four 'B' inputs. A separate output is available for each possible condition. Words of greater length may be compared by simply connecting the corresponding outputs on a stage handling less significant bits to the cascade inputs of the next stage handling more significant bits. The final output comes from the most significant comparator. On the least significant comparator and where only one comparator is in use, the A=B cascade input must be connected to logic 1 and the other two cascade inputs to logic 0.

	7485	74LS85	74HC85	4063BE
Propagation delay compare inputs to outputs				
	low to high 5V	12ns	19ns	21ns
	10V			625ns
	15V			250ns
	high to low 5V	15ns	15ns	21ns
	10V			625ns
cascade inputs to outputs				
	low to high 5V	13ns	13ns	16ns
	10V			500ns
	15V			200ns
	high to low 5V	11ns	11ns	13ns
	10V			140ns
Supply current avge	55mA	10.4mA		140ns

7485, 74LS85, 74HC85
4063BE



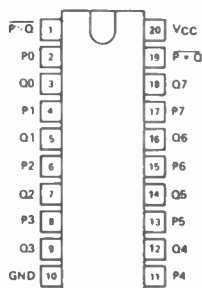
Order

QX63T (7485) £1.15
 YF35Q (74LS85) 80p
 UB22Y (74HC85) £1.35
 QW41U (4063BE) 92p

8-Bit

The 74LS684 can determine whether the binary code on the eight 'P' inputs is greater than, equal to, or less than the binary code on the eight 'Q' inputs. When P>Q, pin 1 goes low, when P=Q, pin 19 goes low and when P<Q, both pin 1 and pin 19 are high.

74LS684



Propagation delay from P inputs to pin 19	low to high	15ns
	high to low	17ns
	to pin 1 low to high	22ns
	high to low	17ns
	from Q inputs to pin 19 low to high	16ns
	high to low	15ns
to pin 1	low to high	24ns
	high to low	20ns
Supply current		40mA

Order

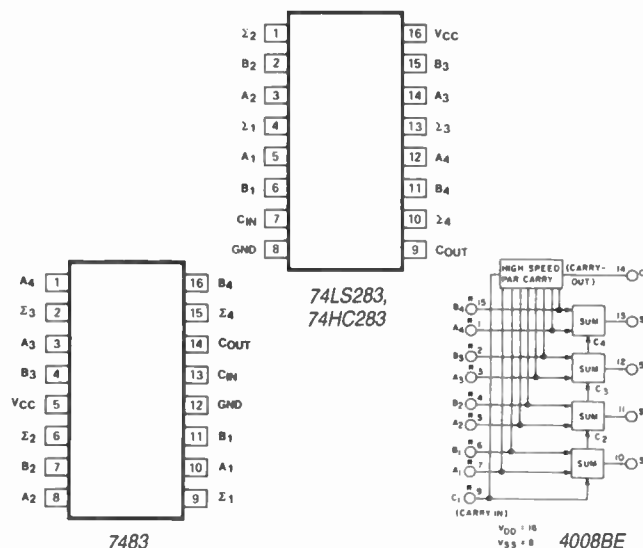
QQ63T (74LS684) £3.99

ARITHMETIC

4-Bit Full Adders

These devices will add together two four bit binary numbers and generate a carry if applicable. A fast internal look-ahead allows the carry to be generated very quickly keeping the total summing time relatively low even when large numbers of these devices are cascaded. To connect together, simply join the carry output of a stage handling less significant bits to the carry input of the next stage handling more significant bits. The carry input of the least significant device and where only one is in use, must be connected to logic 0.

	7483	74LS283	74HC283	4008BE
Propagation delay carry in to sum out low to high				
	5V	14ns	16ns	16ns
	10V			370ns
	15V			155ns
	high to low 5V	12ns	15ns	16ns
	10V			370ns
Propagation delay sum in to sum out low to high				
	5V	16ns	15ns	15ns
	10V			400ns
	15V			160ns
	high to low 5V	16ns	15ns	15ns
	10V			115ns
Propagation delay carry in to carry out low to high				
	5V	9ns	11ns	11ns
	10V			100ns
	15V			50ns
	high to low 5V	11ns	11ns	11ns
	10V			40ns
Propagation delay sum in to carry out low to high				
	5V	9ns	11ns	12ns
	10V			200ns
	15V			90ns
	high to low 5V	11ns	12ns	12ns
	10V			65ns
Supply current avge	66mA	19mA		200ns



Order

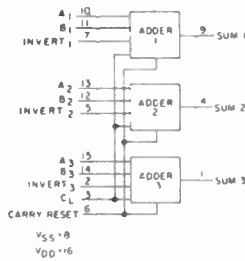
QX85G (7483) £1.15
 YH02C (74LS283) 92p
 UB73Q (74HC283) £3.85
 QW14Q (4008BE) 69p

Triple Serial Adders

These devices consist of three serial adder circuits with common clock and carry-reset inputs. Each adder has two data inputs and an 'invert' input. When 'invert' is high, the sum is complemented. Data words are entered serially, least significant bit first and sign bit last. The output is the sum of the input bits plus the carry from the previous serial sum. The carry is added on the positive-going clock transition in the 4032BE and on the negative-going clock transition in the 4038BE, thus input data transitions should occur as soon as possible after the triggering edge. At the end of each word the carry may be reset by applying logic 1 to pin 6.

4032BE and 4038BE

Propagation delay clock to sum outputs	5V	325ns
	10V	175ns
	15V	150ns
other inputs to sum outputs	5V	260ns
	10V	120ns
	15V	90ns
Maximum clock frequency	5V	4.5MHz
	10V	10MHz
	15V	15MHz



Order

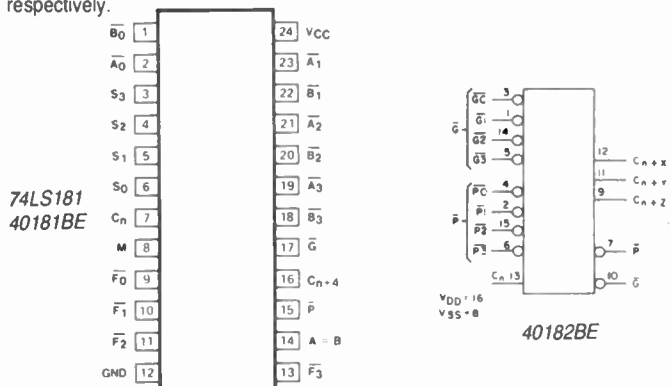
QW22Y (4032BE)	74p
QW26D (4038BE)	86p

Arithmetic Logic Unit & Look Ahead Carry Block

Type '181' is an arithmetic logic unit (ALU) that can perform 16 different binary arithmetic operations on two 4-bit words depending on the code on the select inputs. Operations include addition, subtraction, decrement, 2's complement, straight transfer etc. A fast carry look-ahead permits fast operation even where several devices are cascaded. When used with the '182' look-ahead carry generator, high speed arithmetic operations can be performed on very large numbers. For lower speeds a carry output on the ALU may simply be connected to the carry input on the next most significant device.

	74LS181	40181BE	40182BE
Propagation delay A or B to G or P			
low to high/high to low	5V	21ns/22ns	400ns
	10V		160ns
	15V		120ns
A or B, G or P to F, carry out or A=B	5V	25ns/27ns	500ns
	10V		200ns
	15V		100ns
carry in to F	5V	17ns/13ns	320ns
	10V		135ns
	15V		100ns
carry in to carry out	5V	18ns/13ns	200ns
	10V		240ns
	15V		100ns
Supply current avg		21mA	

40181BE and 40182BE are pin for pin equivalents to 4581BE and 4582BE respectively.



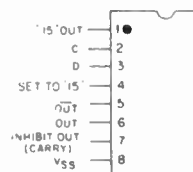
Order

YF76H (74LS181)	£2.18
QW74R (40181BE)	£2.52
QW75S (40182BE)	92p

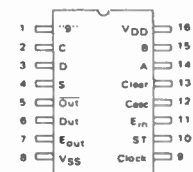
Rate Multipliers

Type '4527' provides an output pulse rate based on the BCD number on A, B, C and D. For example, if 6 is the input number, then there will be six output pulses for every 10 pulses input on pin 9. Complementary outputs are provided as well as a strobe for inhibiting or enabling the outputs. Large numbers may be dealt with by cascading chips and a cascade and enable input and enable output are provided for this purpose. The '9' output is provided for parallel enable configurations. 'Clear' and 'set to 9' inputs are also available. Type '4089' provides an output pulse rate based on the 4-bit binary number on A, B, C and D. For example, if 13 is the input number, then there will be 13 output pulses for every 16 pulses input on pin 9. Otherwise this IC is the same as the '4527' and pin-for-pin compatible.

	4089BE	4527BE
Propagation delay clock to out	5V	150ns
	10V	200ns
	15V	75ns
Maximum clock frequency	5V	60ns
	10V	70ns
	15V	2.4MHz
		5MHz
		7MHz
		2MHz
		4.5MHz
		6MHz



4089BE



4527BE

Order

QW52G (4089BE)	£1.38
UF24B (4527BE)	£1.65

MULTIVIBRATORS

The table below shows the basic differences between the different types available.

	121	122	123	221	4047	4098	4538
Single	*	*			*		
Dual			*	*		*	*
Schmitt inputs	*			*			
Retriggerable		*	*		*	*	*
Precision pulse width							*
Basic type			122	121			4098

74 and 74LS Types

On types 74121 and 74LS221 external capacitance is limited to values between 10pF and 10µF or up to 1000µF if pulse cut-off is not critical. A1 and A2 (or A on '221') are negative-edge triggered logic inputs and will trigger the monostable when either or both go to logic 0 with B at logic 1. B is a positive Schmitt trigger input for slow edges or level detection and will trigger the monostable when it goes to logic 1 with A1, A2 at logic 0. With no external capacitor, and pin 9 connected to pin 14 ('121' only) or 2k connected between 7/15 and 16 (74LS122 only) pulse width is about 30ns. Instead a resistor in the range 1k4 to 40k (or 100k on LS221) may be connected between pin 11 and pin 14. Pulse width is equal to 0.695R_TC_T, where R_T is in ohms and C_T in Farads. With electrolytic capacitors, connect the negative to C_{EXT} and positive to R_{EXT}/C_{EXT}. The resistor is connected between R_{EXT}/C_{EXT} and V_{CC}. On type '122' and '123' there is no restriction on external capacitance value and the external resistor can be between 5k and 50k (or 260k in LS types). Once triggered, the basic pulse width may be extended by retriggering at one of the inputs, or shortened by using the clear input. The pulse width is non-linear for values of C_{EXT} lower than 1000pF, but otherwise the pulse width for each type is as follows:

$$74122 \text{ and } 74123 \quad R_T C_T K (1 + (0.7/R_T))$$

here R_T is in ohms and C_T in farads. K is equal to 0.32 for 74122 and 0.28 for 74123. When using electrolytic capacitors, a 1N4148 diode should be connected between R_{EXT}/C_{EXT} and the junction of the external resistor and capacitor, cathode to IC terminal. In this condition K is equal to 0.28 for 74122 and 0.25 for 74123. If retrigger and clear are not required 74122 offers more precise pulse widths.

$$74LS122 \text{ and } 74LS123 \quad R_T C_T K$$

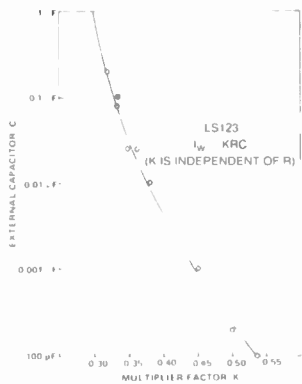
where R_T is in ohms and C_T is farads. K is equal to 0.45 for 74LS122. For 74LS123, K is determined from the graph at the top of the next page.

	121	LS221	122	LS122	123	LS123
Propagation delay A to Q low to high	45ns	45ns	22ns	23ns	22ns	23ns
Q high to low	50ns	50ns	30ns	32ns	30ns	32ns
Propagation delay B to Q low to high	35ns	35ns	19ns	23ns	19ns	23ns
Q high to low	40ns	40ns	27ns	34ns	27ns	34ns
Duty cycle R _T = 2k	67%	50%				
R _T = max	90%	90%				
Supply current quiescent	13mA	4.7mA	23mA	6mA	46mA	12mA
triggered	23mA	19mA	23mA	6mA	46mA	12mA

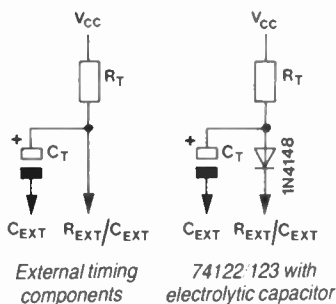
Table 1

Function	Connect V _{DD} to pins		Connect V _{SS} to pins		Connect input pulse to		Also join together	
	Mono 1	Mono 2	Mono 1	Mono 2	Mono 1	Mono 2	Mono 1	Mono 2
Trigger on leading edge and retriggerable	3,5	11,13			4	12		
Trigger on leading edge and not retriggerable	3	13			4	12	5 to 7	11 to 9
Trigger on trailing edge and retriggerable	3	13	4	12	5	11		
Trigger on trailing edge and not retriggerable	3	13			5	11	4 to 6	12 to 10
One section: unused section	5	11	3,4	12,13				

V_{DD} must also be connected to pin 16 and V_{SS} to pin 8 for all applications.



74LS123 Value of K



External timing components

74122/123 with electrolytic capacitor

The C_{EXT} terminal must be connected to ground. A diode is not required when using electrolytic capacitors. These types must have a 0.0047μF ceramic capacitor connected between V_{CC} and ground as close as possible to the IC.

CMOS Types

Type 4047BE may be used in astable and monostable modes. To obtain the various functions available, make connections as follows:

Function	Connect these pins to		Connect input to	Output at pins	Output period or pulse width
	V _{DD}	V _{SS}			
Astable operation					
Free running	4,5,6,14	7,8,9,12		10,11,13	4.4RC secs
True gating	4,6,14	7,8,9,12	5	10,11,13	4.4RC secs
Complement gating	6,14	5,7,8,9,12	4	10,11,13	4.4RC secs
Monostable operation					
Pos-edge trigger	4,14	5,6,7,9,12	8	10,11	2.48RC secs
Neg-edge trigger	4,8,14	5,7,9,12	6	10,11	2.48RC secs
Retriggerable	4,14	5,6,7,8,9	12	10,11	2.48RC secs
Externl countdown*	14	5,6,7,8,9,12		10,11	2.48RC secs

*Connect the input pulse to reset on an external counting chip and the output of the counter to pin 4 on 4047BE.

Frequency shown is available from pin 10 and its inversion on pin 11. In astable mode only, double the frequency of pin 10 is available at pin 13. R is any value between 10k and 1M and C is any practical value over 100pF for astable or 1000pF for monostable. Only non-polarised, low leakage capacitors are suitable. R is connected between pins 2 and 3, and C between pins 1 and 3.

Caution: Pin 3 on this device does not have internal static protection circuitry. Extreme care must be taken when handling this device.

	5V	10V	15V
Propagation delay pins 4, 5 to 13	200ns	100ns	80ns
pins 4, 5 to 10, 11	350ns	175ns	125ns
pins 6, 8 to 10, 11	500ns	225ns	150ns
pin 12 to 10, 11	300ns	150ns	100ns
pin 9 to 10, 11	250ns	100ns	70ns

Type 4098BE is a dual monostable multivibrator. To obtain the various functions available, make connections as shown in Table 1 above.

The output pulse width is equal to R_xC_x/2 where R_x is any value between 5k and 10M (1M 4528BE) connected between pins 16 and 2 (14), and C_x is between 0.01μF and 100μF connected between pins 2 (14) and 1 (15). Capacitors between 10pF and 0.01μF may be used but the pulse width is non-linear in this area. Electrolytic capacitors are not recommended, but if used negative should be connected to pin 1 (15) and a 1N4148 connected in parallel with R_x, cathode to V_{DD}. A reset pin is provided to immediately terminate the pulse or prevent output pulses when power first switched on.

	5V	10V	15V
Propagation delay trigger to output	250ns	125ns	100ns

4098BE is pin-for-pin compatible with type 4528BE in most applications.

74HC Types

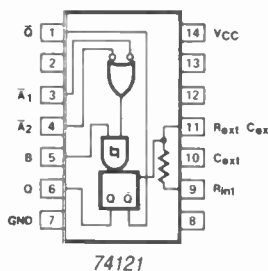
The minimum external resistance is 1.4k, but there is no restriction on the maximum value. There is no restriction on capacitance value either, but with very large values, over 1μF connect a diode in parallel with R_x, cathode to V_{CC}. The pulse width on types HC123 and HC221 is equal to R_xC_x and on type HC4538 it is 0.7R_xC_x.

326

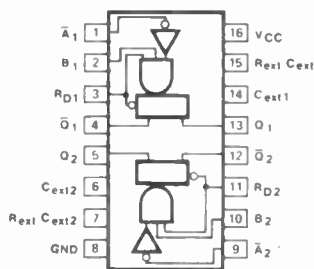
All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

	HC123	HC221	HC4538
Propagation delay trigger to Q	22ns	22ns	23ns
trigger to Q̄	25ns	25ns	26ns

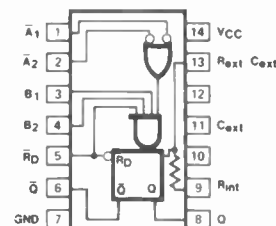
Propagate delay trigger to Q



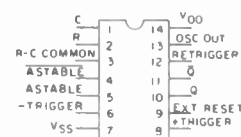
74121



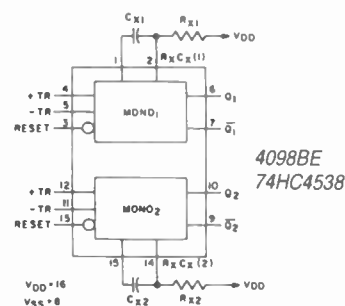
74123, 74LS123, 74HC123
74LS221, 74HC221



74122, 74LS122



4047BE



4098BE
74HC4538

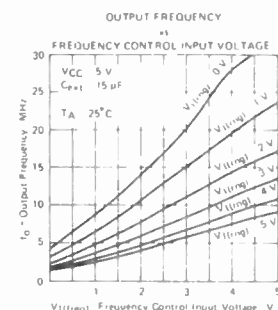
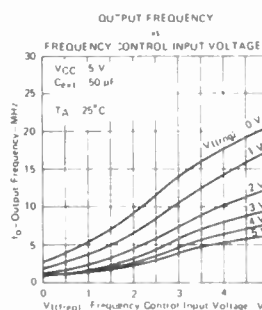
Order

QX73Q (74121)	51p
WH00A (74122)	74p
QQ54J (74LS122)	80p
WH01B (74123)	86p
YF48C (74LS123)	92p
UB26D (74HC123)	£2.40
YF86T (74LS221)	97p
UB52G (74HC221)	£2.85
QX20W (4047BE)	57p
QX29G (4098BE)	80p
UF19V (74HC4538)	£1.85

OSCILLATORS

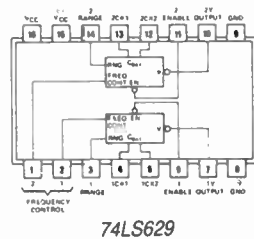
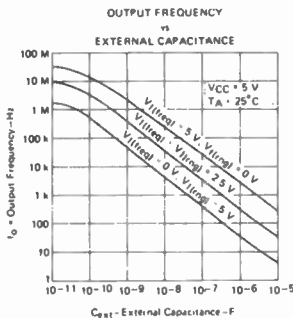
74LS629

Two fully independent voltage controlled oscillators in a single package. Pins 15 and 16, and 8 and 9 may be connected together, but where high precision is required and always where frequencies over 10MHz are involved, pins 15 and 8



should be connected to a separate high stability supply. When the enable input is high, the oscillator is disabled. The output frequency is determined by the capacitor connected between pins 4 and 5 (12 and 13) and the voltage on pin 2 (1) and pin 3 (14). The smaller the voltage on 'range', the greater the frequency change when the voltage is varied on 'frequency'. The graphs below allow selection of a suitable capacitor.

Output frequency (min) 1Hz
 (max) 20MHz
 Supply current 35mA



74LS629

Order

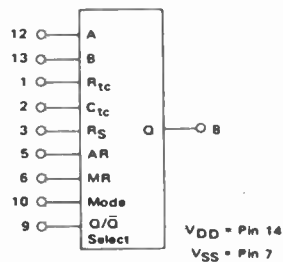
WH02C (74LS629=74LS124) £1.49

4541BE

This chip comprises an oscillator and programmable divider. The oscillator frequency is determined by the RC network on pins 1, 2 and 3. R_{TC} should be between 5k and 1M and R_S should be twice R_{TC} . C_{TC} should be in the range 100pF to 0.1µF. All three components are connected to their appropriate pins and the other ends simply all connected together. The frequency is equal to $1/(2.3R_{TC}C_{TC})$ between 1kHz and 100kHz. A code set up on inputs A and B determines the division ratio of the counter stage as follows:

A	B	Count
0	0	8192
0	1	1024
1	0	256
1	1	65536

4541BE



A 0 on pin 9 will set the output at 0 during reset or 1 if pin 9 is at 1. Pin 6 when set to 1, resets the counter regardless of counter state and the output goes to the condition set on pin 9. Set pin 6 to 0 for counting to commence. With pin 10 set to 1 the count is continuous, but with a 0 on pin 10, after one complete cycle on the output, the count will stop until pin 6 is pulsed. With a 0 on pin 5, the IC is reset when power is turned on, but if this is not required connect pin 5 to logic 1 for low power consumption. With pin 5 low, the supply current, which otherwise would be less than 15nA (quiescent), will be 30µA at 10V and 82µA at 15V (typical). An external frequency may be connected to pin 3 (and pins 1 and 2 left open) if desired.

	5V	10V	15V
Propagation delay clock to Q (÷256)	3.5µs	1.25µs	0.9µs
(÷65536)	6µs	3.5µs	2.5µs

Order

QQ47B (4541BE) £1.09

PHASE LOCKED LOOPS

The '4046' consists of a voltage controlled oscillator, source follower, two phase comparators having a common signal-input amplifier and a common comparator input, and a 5.2V zener diode for supply regulation if required. Resistor R1 connected between pins 11 and 8 and in the range 5k to 1M, and C1 connected between pins 6 and 7 and in the range 50pF to 0.01µF, together determine the frequency range of the VCO. R2 enables the VCO to have a frequency offset if required and is connected between pin 12 and 8 and is in the range 5k to 1M. The VCO frequency range as set by R1, R2 and C1 is as follows:

$$f_{min} = 1/(R2(C1+32pF)) \text{ when VCO input} = V_{SS}$$

$$f_{max} = 1/(R1(C1+32pF)) + f_{min} \text{ when VCO input} = V_{DD}$$

A low pass filter connected between comparator output (pin 2 or 13) determines the frequency capture range and because of the very high input impedance at pin 9 (19¹²Ω), the filter is simple to design. Connect R3 between pin 2 or 13 and 9 and C2 between pin 9 and 8. The frequency capture range (2f_c) is determined as follows:

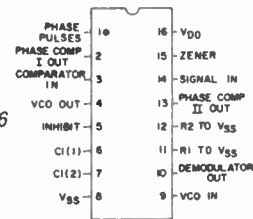
$$2f_c = 1/\pi(\sqrt{((2r_{f1})/(R3.C2))}) \text{ where } 2f_c = f_{max} - f_{min}$$

In order not to load the low-pass filter, a source follower output of the VCO is available at pin 10. If in use connect a load resistor of 10k or more between pin 10 and 8. The VCO can be connected directly or via frequency dividers to the comparator inputs. A logic 0 on pin 5 enables the VCO and source follower, while a logic 1 turns off both to minimise stand-by power consumption.

4046BE*

	5V	10V	15V
Phase comparators			
Input resistance pin 14	2MΩ	0.4MΩ	0.2MΩ
Input sensitivity peak-to-peak	200mV	400mV	700mV
VCO			
Max frequency (R1 = 5k, C1 = 50pF)	0.8MHz	1.4MHz	2.4MHz
Frequency stability	0.12%/°C	0.04%/°C	0.015%/°C
Linearity	1%	1%	1%
Output duty cycle	50%	50%	50%
Source follower			
Offset voltage	1.8V	1.8V	1.8V

*The max frequency for the 74HC4046 is typically 15MHz. No other data was available at the time of going to press.



4046BE, 74HC4046

Order

QW32K (4046BE) 68p
 UF03D (74HC4046) £5.50

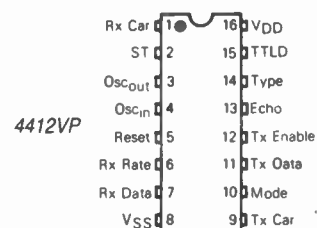
MODEM

The 4412VP is a complete FSK (Frequency Shift Keying) modulator and demodulator compatible with CCITT standards (as used in Europe and the UK) and Bell standards (as used in the US). The modem offers simplex, half-duplex and full-duplex operation at up to 300bps or 600bps. A 1MHz crystal in parallel with 15MΩ should be connected across pins 3 and 4. Pin 14 should be held low for CCITT standard tones and high for Bell standard. Data is input to pin 11 and a tone will be transmitted from pin 9 at the frequency shown below.

Mode	Data	CCITT Tone	Bell Tone
Originate	1	980Hz	1270Hz
Originate	0	1180Hz	1070Hz
Answer	1	1650Hz	2225Hz
Answer	0	1850Hz	2025Hz

If pin 12 is held low, the output is inhibited. Pin 10 selects originate or answer mode. In auto answer modems, the telephone's bell circuit is monitored and when ringing is received, the modem switches to answer mode (pin 10 goes low) and answers the call. When the call is finished, the modem reverts to originate mode (pin 10 high). If pin 13 is taken high, pin 10 is low and pin 14 is low, a 2100Hz tone is transmitted which will disable line echo suppressors. Data is received from line on pin 1. This input must be connected via a switchable filter to notch out the frequencies being transmitted at the same time. Taking pin 6 low enables bit rates up to 600 baud to be received, but this is not recommended in CCITT mode. The demodulated data is output from pin 7. When pin 2 is taken high, the output of the modulator is connected directly to the demodulator for a local loop self-test. Pin 5 is normally held low, the inputs look like pull-up resistors to improve TTL compatibility. When low, the inputs are like normal CMOS interfaces and power dissipation is reduced.

Supply voltage V _{DD}	4.75V to 6V
Input pull-up resistor source current	460µA
Carrier output 2nd harmonic	-25dB
Carrier output voltage	0.3V rms



Order

QQ39N (4412VP) £9.25

OPERATIONAL AMPLIFIERS Bipolar Types

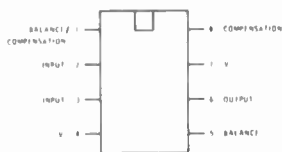
Absolute max. ratings	LM301A	LM308	LM324	LM592	LM833	NE531	NE5534A	NE5539	OP-07C	OP-27G	μ A709C	μ A741C	μ A747C	μ A748C	1458C	3403	4136	
Voltage supply range (V _{CC})	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 1.5V$ to $\pm 16V$ or $3V$ to $32V$	$\pm 3V$ to $\pm 8V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 22V$	$\pm 3V$ to $\pm 20V$	$\pm 5V$ to $\pm 10V$	$\pm 2.5V$ to $\pm 22V$	$\pm 5V$ to $\pm 22V$	$\pm 9V$ to $\pm 18V$	$\pm 3V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 22V$	$\pm 3V$ to $\pm 18V$	$\pm 1.25V$ to $\pm 18V$ or $2.5V$ to $36V$	$\pm 2.5V$ to $\pm 18V$	
Power dissipation	500mW	500mW	570mW	500mW	500mW	500mW	500mW	550mW	500mW	658mW	250mW	500mW	800mW	500mW	500mW	500mW	800mW	
Differential v_p volts (max)	30V	30V	32V	$\pm 5V$	30V	15V	$\pm 0.5V$	$\pm 0.25V$	30V	0.7V	5V	30V	30V	30V	30V	36V	30V	
Max input voltage, one input earthed	15V	15V	32V	$\pm 6V$	15V	15V	13V	2.5V	15V	$\pm 15V$	10V	15V	15V	15V	15V	36V	15V	
Typical ratings at 25°C with 2kΩ load																		
Input offset voltage	2mV	2mV	2mV		0.3mV	2mV	3mV	2.5mV	60 μ V	30 μ V	2mV	1mV	1mV	1mV	1mV	2mV	0.5mV	
Input offset current	3nA	0.2nA	$\pm 5nA$	0.4 μ A	10nA	50nA	20nA	2 μ A (max)	0.8nA	12nA	100nA	30nA	80nA	40nA	80nA	30nA	5nA	
Input bias current	70nA	1.5nA	45nA	9 μ A	500nA	400nA	500nA	5nA	$\pm 1.8nA$	$\pm 15nA$	300nA	200nA	200nA	120nA	200nA	150nA	40nA	
Input resistance	2M Ω	40M Ω		$>4k\Omega$	20M Ω	100k Ω	100k Ω	100k Ω	33M Ω	4M Ω	250k Ω	1M Ω	1M Ω	800k Ω	1M Ω		5M Ω	
Common mode rejection ratio	90dB	100dB	70dB	86dB	100dB	100dB	100dB	85dB	120dB	120dB	90dB	90dB	90dB	90dB	90dB	90dB	100dB	
Supply voltage rejection ratio	96dB	96dB	100dB	70dB	100dB	100dB	100dB	74dB	104dB	118dB	92dB	96dB	96dB	90dB	96dB	90dB	100dB	
Large signal voltage gain	104dB	110dB	100dB	52dB	110dB	96dB	100dB	52dB	112dB	123dB	93dB	104dB	104dB	104dB	104dB	100dB	110dB	
Output voltage swing	$\pm 13V$	$\pm 14V$	$\pm 14.5V$	4V	$\pm 13.5V$	$\pm 13V$	$\pm 13V$	$+2.7V/-2.2V$	$\pm 13V$	$\pm 13.5V$	$\pm 13V$	$\pm 13V$	$\pm 13V$	$\pm 13V$	$\pm 13V$	$\pm 14V$	$\pm 13V$	
Slew rate	0.4V/ μ s	0.2V/ μ s	0.5V/ μ s		7V/ μ s	35V/ μ s	13V/ μ s	600V/ μ s	0.17V/ μ s	2.8V/ μ s	0.25V/ μ s	0.5V/ μ s	0.5V/ μ s	0.5V/ μ s	0.5V/ μ s	1.2V/ μ s	1V/ μ s	
Unity gain bandwidth	1MHz	1MHz	1MHz	120MHz	9MHz	1MHz	10MHz	1.2GHz	0.5MHz	8MHz	5MHz	1MHz	1MHz	1MHz	1MHz	1MHz	3MHz	
Full power bandwidth	10kHz	10kHz	15kHz	20MHz	120kHz	500kHz	200kHz	48MHz	3.4kHz	34kHz	up to 200kHz	10kHz	10kHz	10kHz	10kHz	40kHz	25kHz	
Supply current	1.8mA	0.3mA	1.5mA	18mA	5mA	5.5mA	4mA	+14mA/-11mA	2.7mA	3.5mA	2.5mA	1.7mA	3mA	1.75mA	3mA	3mA	7mA	

LM301A

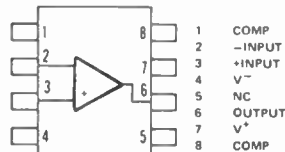
A general purpose op-amp featuring low input currents and low temperature drift on input currents. The amp is overload protected on input and output with no latch-up when the common mode range is exceeded. External compensation capacitor (33pF approx) is required for stability, but this value can be varied depending on application such that slew rates of 10V/ μ s and bandwidths of 10MHz can be achieved.

Order

QH36P (LM301A) 54p



LM301A



LM308

LM308

A precision op-amp featuring extremely low input currents. The circuit is directly interchangeable with the LM301A in low frequency circuits and incorporates the same protective features. In addition it has very low power consumption making it suitable for battery operation and owing to its very high input resistance operates with less error on 10M Ω sources than a 709C with 10K Ω source.

Order

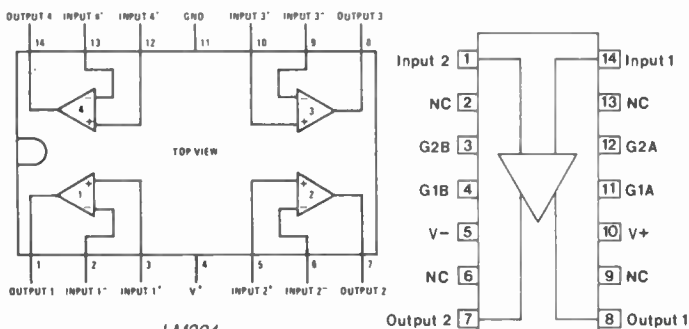
QH37S (LM308) 86p

LM324

A high performance circuit containing four op-amps in one 14-pin DIL package. The amp features very low input offset and bias currents compared with μ A741C. The outputs are class AB with no crossover distortion. Channel separation: 120dB at 1kHz to 20kHz.

Order

UF26D (LM324) 50p



LM324

LM592

LM592

A two stage differential input, differential output, wideband video amplifier. The op-amp features wide bandwidth with low phase distortion and high gain stability and fixed gains of 100 and 400 with no external components or adjustable gain from 0 to 400 with a single resistor. Ideal for use as high, low or band pass filter and for use as video or pulse amplifier in video systems.

Order

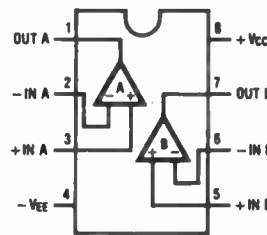
RA77J (LM592N) £1.40

LM833

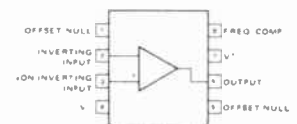
A dual op-amp designed specifically for use as sensitive pre-amps in audio circuits. The amps feature very low noise characteristics, typically 4.5nV/ \sqrt{Hz} , total harmonic distortion of 0.002% from 20Hz to 20kHz and dynamic range $>140dB$. Channel separation 120dB from 20Hz to 20kHz.

Order

UF49D (LM833N) £1.65



LM833



NE531

NE531

A high performance op-amp with a very high slew rate capability yet keeping the DC performance of the μ A741. External compensation capacitor (100pF) is required for stability, but this can be reduced to very low values (1.8pF) to give wide flat frequency responses at very high gains.

Order

WQ54J (NE531) £2.20

NE5534A

Designed for use in high quality and professional audio equipment where low noise is of prime importance. The op-amp has a typical input noise voltage at 1kHz of 3.5V/ \sqrt{Hz} . In addition it has better output drive capabilities and much higher small signal and power bandwidths than most other op-amps, yet is a direct pin-for-pin replacement for a μ A741.

Order

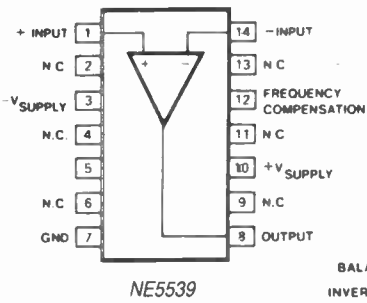
YY68Y (NE5534A) £1.20

NE5539

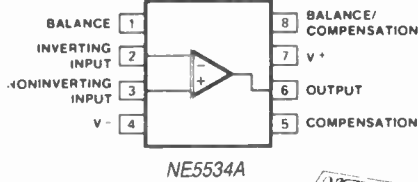
A very wide bandwidth, high slew rate op-amp. At high frequency the layout is very critical and a double-sided pcb with ground planes is recommended. The op-amp is stable for all closed loop gains greater than 7.

Order

YY67X (NE5539) £5.95



NE5539



NE5534A

NEW

OP-07CN

A precision instrumentation grade op-amp featuring ultra-low offset voltage and very low bias currents. Low frequency noise is minimised.

Order

RA73Q (OP-07CNB) £2.20

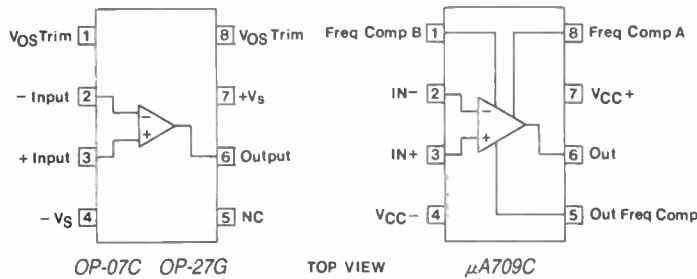
OP-27GN

An instrumentation grade op-amp featuring very low noise, wide bandwidth, high slew rate and ultra-low offset voltage. The op-amp is ideal for professional quality audio systems giving a performance adequate for the most demanding high fidelity applications. The OP-27 has an undistorted power bandwidth of 34kHz and at 8V peak-to-peak is undistorted to 100kHz. Input noise levels are typically less than 3.8nV/√Hz at 10Hz and less than 3.3nV/√Hz from 30Hz upwards.

NEW

Order

RA74R (OP-27GNB) £6.50



OP-07C OP-27G

TOP VIEW

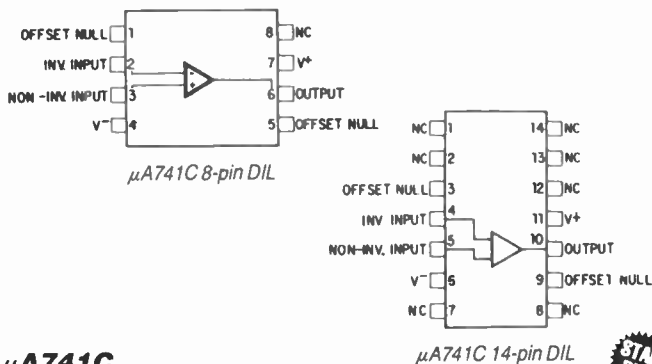
μA709C

μA709C

A general purpose op-amp featuring wide flat frequency response capabilities at reasonably high gains owing to the input and output compensation capacitors being able to be varied.

Order

QL20W (μA709C) 40p



μA741C 8-pin DIL

μA741C 14-pin DIL

STAR BUY

μA741C

The industry standard general purpose op-amp featuring internal frequency compensation. The amp is overload protected on input and output with no latch-up if common mode range is exceeded.

Order

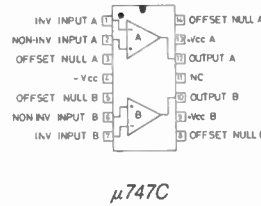
QL22Y (μA741C 8-pin DIL) 18p
QL23A (μA741C 14-pin DIL) 55p

μA747C

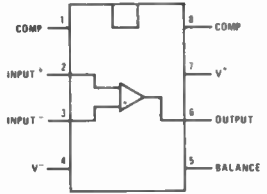
Two μA741C op-amps in one 14-pin DIL package. The two amps share a common bias network and power supply leads, but otherwise are completely separate. Channel separation: 98dB at 1kHz.

Order

QL24B (μA747C) 69p



μ747C



μA748C

μA748C

A general purpose op-amp very similar to the μA741C, but with external frequency compensation required allowing best high frequency performance to be achieved for any gain.

Order

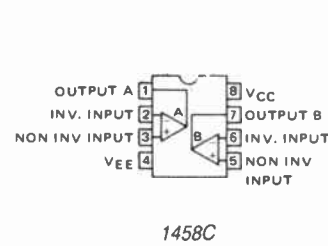
QL25C (μA748C) 40p

1458C

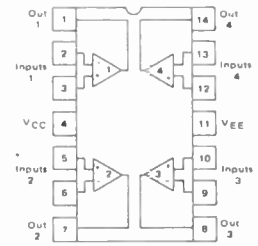
Two μA741C op-amps in one 8-pin DIL package. The two amps share a common bias network and power supply leads, but otherwise are completely separate. Channel separation: 98dB at 1kHz.

Order

QH46A (1458C) 40p



1458C



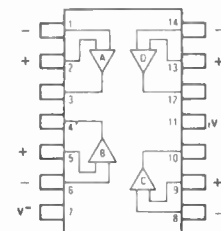
3403

3403

A high performance circuit containing four op-amps in one 14-pin DIL package. The amp features a wide full power bandwidth and slew rate better than μA741C. The outputs are class AB with no crossover distortion. Channel separation: 120dB at 1kHz to 20kHz.

Order

QH51F (3403) 95p



4136

4136

A high performance circuit containing four op-amps in one 14-pin DIL package. The amp features low noise input transistors making it specially suitable for use in audio pre-amplifiers and signal processing applications. The outputs are class AB with a very low crossover distortion. Channel separation: 123dB at 1kHz, >100dB at 20Hz to 25kHz. Total harmonic distortion typically <0.5%.

Order

XX01B (4136) 98p

LM390N

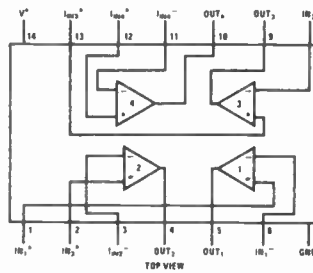
Four dual input, internally compensated amplifiers designed primarily for single power rail operation. These current differencing amplifiers use a current mirror to achieve the non-inverting function. When driving from a low impedance source a resistor should be placed in series to limit the peak input current to less than 20mA.

Absolute max ratings

Supply voltage range: 4V to 32V or $\pm 2V$ to $\pm 16V$
 Power dissipation max: 570mW
 Input current max: 20mA

Typical ratings at 25°C

Open loop voltage gain: 70dB
 Input resistance: 1M Ω
 Output resistance: 8k Ω
 Unity gain bandwidth: 2.5MHz
 Input bias current: 30nA
 Slew rate positive output swing: 0.5V/ μ s



LM390N

Slew rate negative output swing: 20V/ μ s
 Supply current: 6.2mA
 Output voltage swing: 29.4V
 Output current capability
 Source: 1.8mA
 Sink: 1.3mA
 Power supply rejection ratio: 70dB
 Mirror gain: 1 μ A/ μ A $\pm 10\%$
 Mirror current: 10 μ A (500 μ A max)
 Negative input current: 1mA
 Full power bandwidth: 35kHz

Order

QH42V (LM390N)

80p

FET Input Types

	CA3130E	CA3140E	CA3240E	LF347	LF351	LF353	LF411	LF412	LF441	LF442
Absolute max ratings										
Voltage supply range V_{CC}	$\pm 2.5V$ to $\pm 8V$ or 5V to 16V	$\pm 2V$ to $\pm 18V$ or 4V to 36V	$\pm 2V$ to $\pm 18V$ or 4V to 36V	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$
Power dissipation	630mW	630mW	630mW	500mW	500mW	500mW	500mW	500mW	500mW	500mW
Differential input voltage (max)	$\pm 8V$	$\pm 8V$	$\pm 8V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$
Max input voltage, one input earthed	$\pm V_{CC}$	$\pm V_{CC}$	$\pm V_{CC}$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$
Typical ratings at 25°C										
Input offset voltage	8mV	5mV	5mV	5mV	5mV	5mV	0.8mV	1mV	1mV	1mV
Input offset current	0.5pA	0.5pA	0.5pA	25pA	25pA	25pA	25pA	25pA	5pA	5pA
Input bias current	5pA	10pA	10pA	50pA	50pA	50pA	50pA	50pA	10pA	10pA
Input resistance	1.5T Ω	1.5T Ω	1.5T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω
Common mode rejection ratio	90dB	90dB	90dB	100dB	100dB	100dB	100dB	100dB	95dB	95dB
Supply voltage rejection ratio	90dB	80dB	80dB	100dB	100dB	100dB	100dB	100dB	90dB	90dB
Large signal voltage gain	110dB	100dB	100dB	100dB	100dB	100dB	106dB	106dB	100dB	100dB
Output voltage swing	13.3V ($V_{CC} = 15V$)	13V ($V_{CC} = 15V$)	13V ($V_{CC} = 15V$)	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13V$	$\pm 13V$
Slew rate	10V/ μ s	9V/ μ s	9V/ μ s	13V/ μ s	13V/ μ s	13V/ μ s	15V/ μ s	15V/ μ s	1V/ μ s	1V/ μ s
Unity gain bandwidth	15MHz	4.5MHz	4.5MHz	4MHz	4MHz	4MHz	4MHz	4MHz	1MHz	1MHz
Full power bandwidth	100kHz	100kHz	100kHz	100kHz	100kHz	100kHz	100kHz	100kHz	15kHz	15kHz
Supply current	2mA	4mA	8.4mA	7.2mA	1.8mA	3.6mA	1.8mA	3.6mA	150 μ A	400 μ A
LF444										
Absolute max ratings										
Voltage supply range V_{CC}	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 18V$	$\pm 5V$ to $\pm 22V$	$\pm 2V$ to $\pm 18V$	$\pm 2V$ to $\pm 18V$	$\pm 2V$ to $\pm 18V$	$\pm 2V$ to $\pm 18V$	$\pm 2V$ to $\pm 18V$	$\pm 2V$ to $\pm 18V$	$\pm 2V$ to $\pm 18V$
Power dissipation	500mW	500mW	500mW	680mW	680mW	680mW	680mW	680mW	680mW	680mW
Differential input voltage (max)	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$	$\pm 30V$
Max input voltage, one input earthed	$\pm 15V$	$\pm 16V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$
Typical ratings at 25°C										
Input offset voltage	3mV	5mV	6mV	3mV	3mV	3mV	3mV	5mV	5mV	5mV
Input offset current	5pA	10pA	2pA	5pA	5pA	5pA	5pA	5pA	5pA	5pA
Input bias current	10pA	50pA	15pA	30pA	30pA	30pA	30pA	30pA	30pA	30pA
Input resistance	1T Ω	0.5T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω	1T Ω
Common mode rejection ratio	95dB	90dB	80dB	76dB	76dB	76dB	76dB	76dB	76dB	76dB
Supply voltage rejection ratio	90dB	96dB	80dB	95dB	76dB	76dB	76dB	76dB	76dB	76dB
Large signal voltage gain	100dB	100dB	100dB	75dB	106dB	106dB	106dB	106dB	106dB	106dB
Output voltage swing	$\pm 13V$	$\pm 13V$	$\pm 12V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$	$\pm 13.5V$
Slew rate	1V/ μ s	0.5V/ μ s	3V/ μ s	3.5V/ μ s	13V/ μ s	13V/ μ s	13V/ μ s	13V/ μ s	13V/ μ s	13V/ μ s
Unity gain bandwidth	1MHz	1MHz	1MHz	3MHz	3MHz	3MHz	3MHz	3MHz	3MHz	3MHz
Full power bandwidth	15kHz	10kHz	40kHz	30kHz	100kHz	100kHz	100kHz	100kHz	100kHz	100kHz
Supply current	800 μ A	2mA	2.8mA	800 μ A	1.4mA	2.8mA	5.6mA	1.4mA	2.8mA	5.6mA

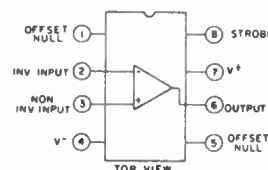
CA3130E

A MOS-FET input, CMOS output op-amp that will operate from a single or dual power supply, and input terminals can be swung up to 0.5V below negative rail. An external compensation capacitor between pins 1 and 8 permits adjustment of frequency/gain characteristic (typically 47pF). Offset null is achieved with 100k Ω pot between pins 1 and 5 with slider to pin 4. Max input-terminal current is 1mA. The output can be strobed.

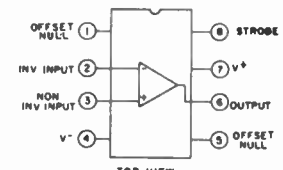
Order

QH28F (CA3130E)

97p



CA3130E



CA3140E

CA3140E & CA3240E

A MOSFET input, bipolar output op-amp that will directly replace the μ A741 in most applications. It will operate from single or dual supply rails and input terminals can be swung up to 0.5V below negative rail. Internally compensated. Max input terminal current is 1mA. The output can be strobed. CA3240E is a dual version of CA3140E. Both are in an 8-pin DIL package.

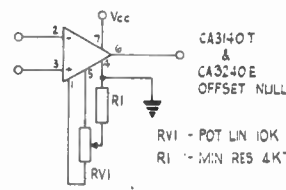
Order

QH29G (CA3140E)

54p

WQ21X (CA3240E)

£1.54



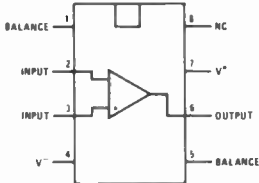
CA3240E

LF13741

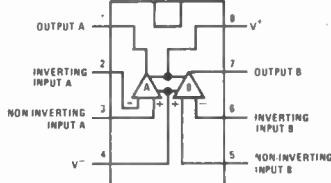
A J-FET input op-amp that is a direct replacement for the μ A741 in all applications. The chip actually consists of a standard μ A741 with Bi-Fet input followers built onto the same die. Thus the user has all the familiar characteristics of the μ A741, but with low input bias current requirements and a very high impedance input.

Order

YY69A (LF13741) 95p



LF351/LF411/LF441/
LF13741/TL071/TL081



LF353/LF412/LF442/
TL072/TL082

LF351, LF353 & LF347

Low-cost high performance J-FET input op-amps that will directly replace the μ A741 in most applications. The devices are low noise and have distortion figures of less than 0.02% over the audio band. It is most important that input voltages never go more negative than the negative supply voltage or the device will be destroyed. The LF351 is supplied in an 8-pin DIL package as is the LF353 which is a dual version and the LF347 is supplied in a 14-pin DIL package and is a quad version. Note that since the inputs are J-FET'S not MOS-FET's no special handling is required.

Order

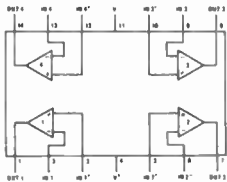
WQ30H (LF351) 46p
WQ31J (LF353) 79p
WQ29G (LF347) £1.35

LF411 and LF412

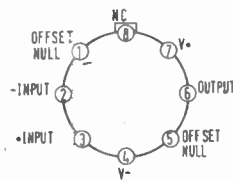
High performance J-FET input op-amps similar to LF351 and LF353 respectively, but with very low input offset voltages and a guaranteed drift of less than $10\mu\text{V}/^\circ\text{C}$.

Order

QY27E (LF411CN) £1.45
QY28F (LF412CN) £2.75



LF347/LF444/ TL064/TL074/TL084



LH0042C

LF441, LF442 and LF444

Low power J-FET input op-amps may be used as direct replacements for the μ A741C, 1458C and 3403 respectively. They offer improved DC characteristics, the same bandwidth, slew rate and gain yet only draw one tenth of the supply current (one fifth for LF444). In addition they offer extremely low input offset voltages and currents and very low bias currents.

Order

QY29G (LF441CN) £1.25
QY30H (LF442CN) £1.95
QY31J (LF444CN) £3.25

LH0042C

A very high performance FET input op-amp featuring ultra low input currents, low noise and high gain. The device has internal 6dB per octave, frequency compensation and is supplied in an 8-pin TO5 metal can.

Order

QH35Q (LH0042C) £8.95

TL064C

A low-power version of the TL084C J-FET op-amp. It features high input impedance, wide bandwidth, high slew rate and low input offset and bias currents. The package contains four op-amps and pin-out is the same as LM324.

Order

RA66W (TL064CN) £1.09

TL071C, TL072C & TL074C



Low noise versions of the TL081-series J-FET op-amps. These amplifiers feature low input bias and offset currents and a fast slew rate. Their low harmonic distortion, 0.01% typical, and low noise make them suitable for use in hi-fi pre-amps. The TL071CP is supplied in an 8-pin DIL package, as is the TL072CP which is a dual version, and the TL074CN is supplied in a 14-pin package and is a quad version.

Order

RA67X (TL071CP) 46p
RA68Y (TL072CP) 68p
RA69A (TL074CN) £1.25

TL081C, TL082C & TL084C

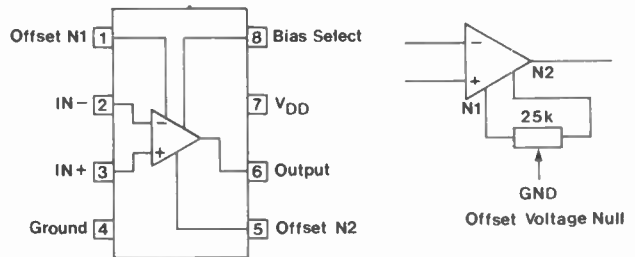


Low cost general purpose J-FET op-amps featuring high slew rates, low input bias and offset currents and low offset voltage temperature coefficient. The TL081CP is supplied in an 8-pin DIL package, as is the TL082CP which is a dual version, and the TL084CN is supplied in a 14-pin package and is a quad version.

Order

RA70M (TL081CP) 34p
RA71N (TL082CP) 57p
RA72P (TL084CN) £1.15

TLC251C



A low-cost low-power programmable op-amp which can operate from single or dual power supplies. A bias select pin can be used to program one of three AC performance and power dissipation levels. The IC will operate at supply voltages down to 1V. Connect pin 8 to pin 7 for low bias mode, or to pin 4 for high bias mode. For medium bias mode pin 8 should be connected to a voltage between ground and supply, but the voltage required varies for different supply voltages. For example if $V_S = 10\text{V}$, pin 8 should be between 0.8V and 9.2V; for $V_S = 16\text{V}$, 0.8V and 14.5V; for $V_S = 4\text{V}$, 0.7V and 3.5V; under 4V, it may not be possible to obtain medium bias.

Specification (typical at 25°C)

Voltage supply range: 1V to 16V
Power dissipation: 725mW
Differential input voltage (max): $\pm 16\text{V}$
Max input voltage,
one input earthed ($V_{DD} = 1\text{V}$): 0.2V
($V_{DD} = 4\text{V}$): 3V
($V_{DD} = 10\text{V}$): 9V
($V_{DD} = 16\text{V}$): 14V

Input offset voltage: 10mV max
Input offset current: 1pA
Input bias current: 1pA
Peak output voltage ($V_{DD} = 1\text{V}$): 450mV
($V_{DD} = 10\text{V}$): 8.6V

	Low bias	Medium bias	High bias
Large signal voltage gain ($V_{DD} = 1\text{V}$)	20V/mV		10V/mV
($V_{DD} = 10\text{V}$)	500V/mV	280V/mV	40V/mV
Common mode rejection ratio			
($V_{DD} = 1\text{V}$)	77dB		77dB
($V_{DD} = 10\text{V}$)	88dB	88dB	88dB
Supply voltage rejection ratio			
($V_{DD} = 10\text{V}$)	88dB	88dB	82dB
Slew rate ($V_{DD} = 1\text{V}$)	0.001V/ μs		0.01V/ μs
($V_{DD} = 10\text{V}$)	0.04V/ μs	0.6V/ μs	4.5V/ μs
Unity gain bandwidth ($V_{DD} = 1\text{V}$)	12kHz		75kHz
($V_{DD} = 10\text{V}$)	100kHz	700kHz	2.3MHz
Supply current ($V_{DD} = 1\text{V}$)	2 μA		12 μA
($V_{DD} = 10\text{V}$)	10 μA	150 μA	1mA

Order

RA75S (TLC251CP) £1.85

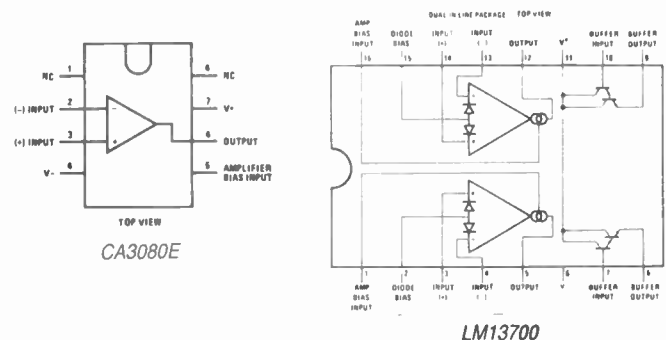
OPERATIONAL TRANSCONDUCTANCE AMPLIFIERS

CA3080E

This 8-pin DIL IC is an op-amp whose output current is proportional to the voltage difference between its input pins. In addition the IC has a bias input which may be used either for gating or for linear gain control. The amplifier has an excellent slew rate and in addition when gated off the amp uses only a minute $10\mu\text{W}$ making it ideal in multiplex applications.

Order

YH58N (CA3080E) **98p**



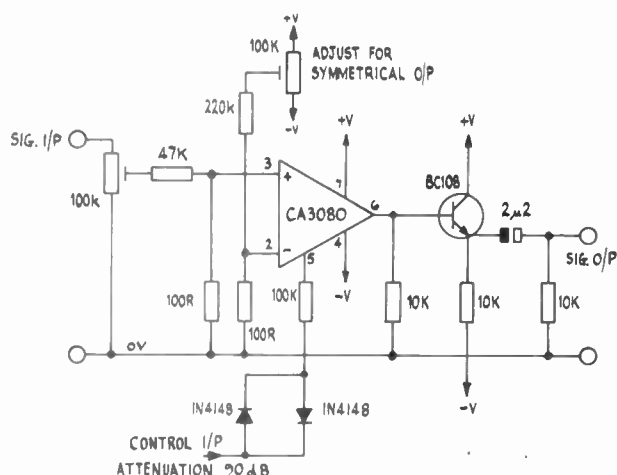
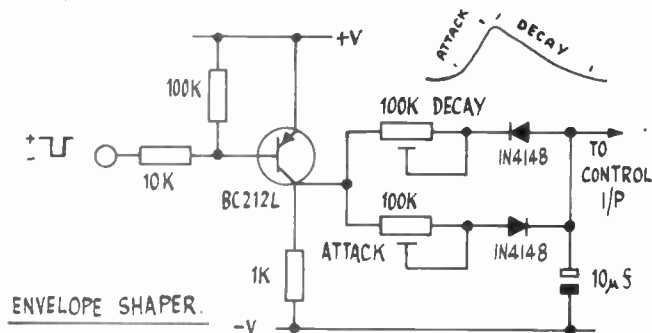
LM13700N

The LM13700 is a dual operational transconductance amplifier with linearising diodes and buffers. It consists of two current controlled transconductance amplifiers each with different inputs and a push pull output. The two amplifiers share common supplies but otherwise operate independently. Linearising diodes are provided at the inputs to reduce distortion and allow higher input levels. The result is a 10dB signal-to-noise improvement referenced to 0.5% THD. High impedance buffers are provided which are specially designed to complement the dynamic range of the amplifiers.

The IC has many useful applications such as voltage controlled amplifiers, voltage controlled resistors, voltage controlled filters, voltage controlled oscillators, phase locked loop, Schmitt trigger tachometer (f to v), peak detector and hold, sample and hold, ramp and hold, true RMS converter, variable temperature coefficient voltage reference, pulse width modulator, log current source, multiplexer, zero standby power timer, four quadrant multiplier, amplitude monitor and stereo volume control. A data sheet is available (40p) which shows circuit details of all the above applications.

Order

YH64U (LM13700N) **£1.95**



Absolute max ratings

Voltage supply range
Power dissipation
Differential input voltage
Diode bias current
Amplifier bias current

CA3080E

$\pm 2\text{V}$ to $\pm 15\text{V}$
125mW
 $\pm 5\text{V}$
—
2mA

LM13700N

$\pm 2\text{V}$ to $\pm 18\text{V}$
570mW
 $\pm 5\text{V}$
2mA
2mA

Typical ratings at 25°C with $V_s = \pm 15\text{V}$

Input offset voltage:
Input offset current
Input bias current:
Input resistance:
Forward transconductance (gm)
Tracking of gm:
Peak output current:
Peak output voltage:
Supply current (per amp):
Common mode rejection ratio
Unity gain bandwidth:
Full power bandwidth:
Slew rate:

0.4mA
120nA
400nA
26k Ω
9600 $\mu\Omega$
—
500 μA
 $\pm 14\text{V}$
1.1mA
110dB
2MHz
200kHz
50V/ μs

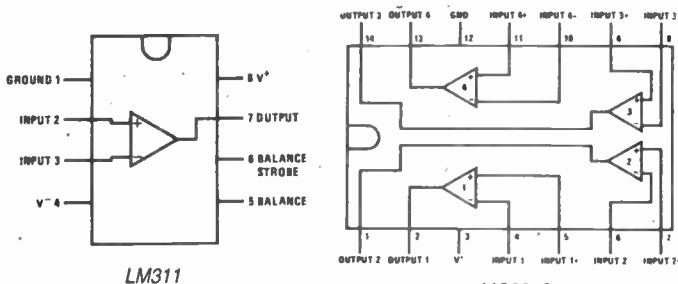
VOLTAGE COMPARATORS

LM311

A voltage comparator that has input currents more than a hundred times lower than the $\mu\text{A}710\text{C}$. It will operate on $\pm 14\text{V}$ or $+5\text{V}$ supplies and will drive RTL, DTL, TTL, MOS and switch voltages up to 40V at currents as high as 50mA. Both input and output can be isolated from system ground and the output can drive loads referred to ground, positive or negative. Offset balancing and strobe capability are provided and outputs can be wire-OR'ed.

Order

QY09K (LM311N) **51p**



MC3302P

Four independent precision voltage comparators designed specifically to operate from a single power supply. These comparators have a unique characteristic in that the input common-mode voltage range includes ground even though operated from a single power supply.

Order

QH48C (MC3302P) **86p**

Absolute maximum ratings

Voltage supply range:
Power dissipation:
Differential input voltage:

LM311

4V to 36V or
 $\pm 2\text{V}$ to $\pm 18\text{V}$
500mW
 $\pm 30\text{V}$

MC3302P

2V to 28V or
 $\pm 1\text{V}$ to $\pm 14\text{V}$
570mW
 $\pm V_{cc}$

Typical ratings at 25°C

Input offset voltage:
Input offset current:
Input bias current:
Voltage gain
Response time:
Saturation voltage:
Output leakage current:
Supply current:

2mV
6nA
100nA
106dB
200ns
0.75V
0.2nA
5.1mA (positive)
4.1mA (negative)



POWER AMP IC's

Gain (closed loop) typical	LM389 26dB	LM831 46dB	TBA820M 34dB	LM377 34dB	LM380 34dB	LM384 34dB
Input impedance	50kΩ	25kΩ	5MΩ	3MΩ	150kΩ	150kΩ
Output power into 4Ω†	-	220mW/channel	1.6W	-	3W	-
8Ω†	325mW	440mW bridge	2W	2.5W/channel	5W	5.5W
Quiescent supply current	6mA	6mA	4mA	15mA	7mA	8.5mA
Supply voltage min to max	4V to 15V	1.8V to 6V	3V to 16V	10V to 26V	8V to 22V	12V to 28V
Recommended supply voltage	6V to 12V	3V or 4.5V	3V to 16V	10V to 26V	8V to 22V	12V to 26V
Short circuit current	-	-	-	1.5A	1.3A	1.3A
Short circuit protection**	No	No	No	Yes	Yes	Yes
Thermal protection	No	No	No	Yes	Yes	Yes
Power supply rejection ratio	50dB	46dB	42dB	70dB	38dB	31dB
Bandwidth	-	20Hz to 20kHz	25Hz to 20kHz	50kHz	100kHz	450kHz
Distortion into 8Ω	0.2% V _S = 6V P _O = 125mW	0.25% V _S = 3V P _O = 50mW	0.4% V _S = 9V P _O = 500mW	0.1% V _S = 20V P _O = 2W/channel	0.2% V _S = 18V P _O = 2W	0.25% V _S = 22V P _O = 4W
Sensitivity	-	20mV	60mV	100mV	100mV	100mV
Power dissipation	825mW	1.4W	1W	9W with 14°C/W heatsink	10W with 12°C/W heatsink	10W with 12°C/W heatsink
Gain (closed loop) typical	TBA810P 37dB	LM383 40dB	LM2879 34dB	TDA2006 30dB	TDA2030 30dB	TDA2005M 50dB
Input impedance	5MΩ	150kΩ	3MΩ	5MΩ	5MΩ	100kΩ
Output power into 4Ω†	6W	7W	-	12W	18W	20W
8Ω†	-	-	9W/channel	8W	11W	-
Quiescent supply current	12mA	45mA	12mA	40mA	40mA	75mA
Supply voltage min to max	4V to 20V	5V to 25V	10V to 35V	±6V to ±15V	±6V to ±18V	6V to 18V
Recommended supply voltage	4V to 18V	5V to 20V	10V to 34V	±12V	±14V	12V to 14.4V
Short circuit current	3A	3.5A	1.5A	3A	3.5A	3.5A
Short circuit protection**	Yes	Yes	Yes	Yes	Yes	Yes
Thermal protection	Yes	Yes	Yes	Yes	Yes	Yes
Power supply rejection ratio	48dB	40dB	70dB	50dB	50dB	55dB
Bandwidth	40Hz to 20kHz	30kHz	50kHz	10Hz to 150kHz	10Hz to 140kHz	40Hz to 20kHz
Distortion into 8Ω	0.3% V _S = 14.4V P _O = 2.5W	0.2% V _S = 14.4V P _O = 4W	0.04% V _S = 28V P _O = 4W/channel	0.1% V _S = ±12V P _O = 4W	0.1% V _S = ±14V P _O = 8W	0.25% V _S = 14.4V P _O = 12W
Sensitivity	75mV	55mV	30mV	200mV	215mV	30mV
Power dissipation	5W with 10°C/W heatsink	15W with 4°C/W heatsink	18W with 4°C/W heatsink	15W with 4°C/W heatsink	18W with 4°C/W heatsink	-

** Short circuit protection where provided operates up to supply voltages of approx 75% of the max voltage shown.

† Distortion = 10% V_S = Supply voltage P_O = Power output

LM389

A ¼W audio amplifier in an 18-pin DIL package which incorporates three separate transistors for use in pre-amps, tone controls etc. The transistors are general purpose, high gain NPN types closely matched and having the following characteristics.

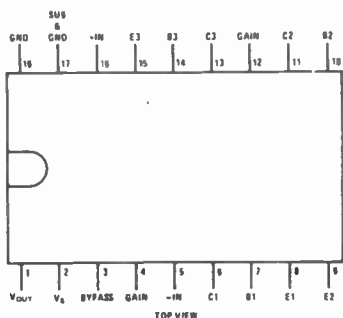
V_{CEO} 12V, V_{CBO} 15V, V_{EBO} 7.1V
Collector to substrate breakdown voltage: 15V
I_C (max) 25mA
Typical h_{FE} 275 @ 1mA each transistor
P_{TOT} (max) 150mW each transistor

The transistors are suitable for use in radio sets since they have typically gains of 5.5 at 100MHz (I_C = 10mA, V_{CE} = 5V). The only unusual point about these transistors is that their collectors must never be more negative than pin 17, otherwise they may be used in the same way as any discrete transistor.

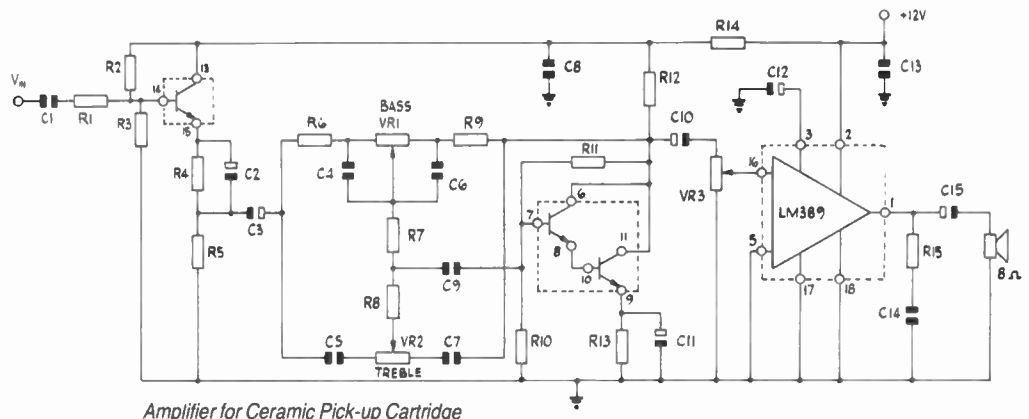
Parts List

R1:	Min Res 820k	VR1:	Pot Lin 100k
R2:	Min Res 82k	VR2:	Pot Lin 100k
R3:	Min Res 120k	VR3:	Pot Log 10k
R4,6,7,8,9:	Min Res 10k	C1:	Polyester 0.01µF
R5:	Min Res 2k2	C2,3,10:	Axial 1µF 63V
R10:	Min Res 180k	C4,5,6,7:	Polyester 0.033µF
R11:	Min Res 470k	C8,9,13:	Polyester 0.1µF
R12:	Min Res 5k6	C11:	Axial 47µF 10V
R13:	Min Res 470Ω	C12:	Axial 10µF 25V
R14:	Min Res 1k2	C14:	Polyester 0.047µF
R15:	Min Res 2.7Ω	C15:	Axial 470µF 16V

For stereo double above except VR1 and 2 which should be Dual Lin Pots and VR3 should be changed to Pot Log 22k, if a balance control is added. Use a Pot Lin 22k for the balance with the wiper connected to earth and the ends of the track connected to the negative of C10 on each channel.



LM389



Amplifier for Ceramic Pick-up Cartridge

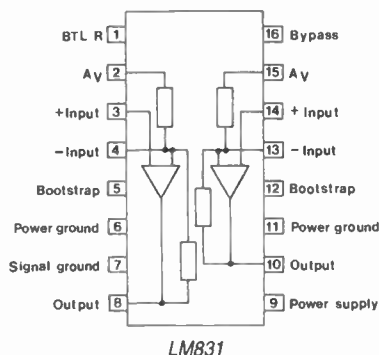
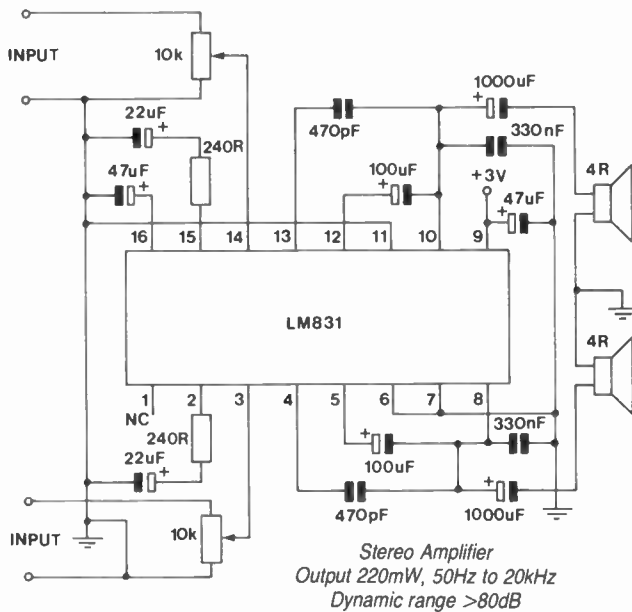
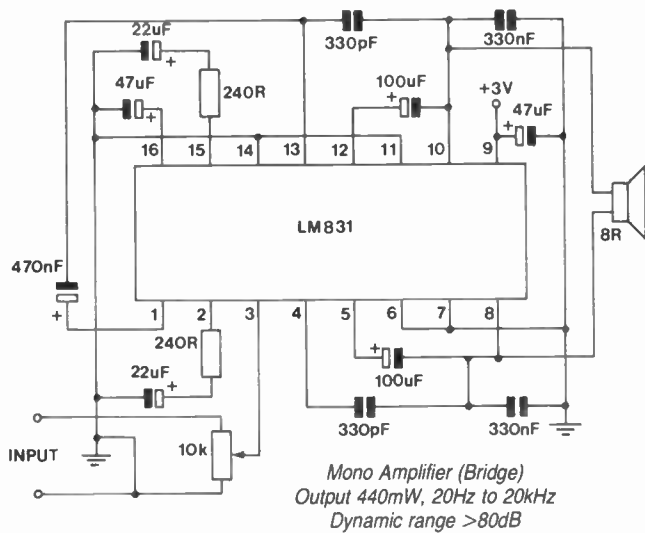
Order

WQ36P (LM389) £1.82

LM831

NEW

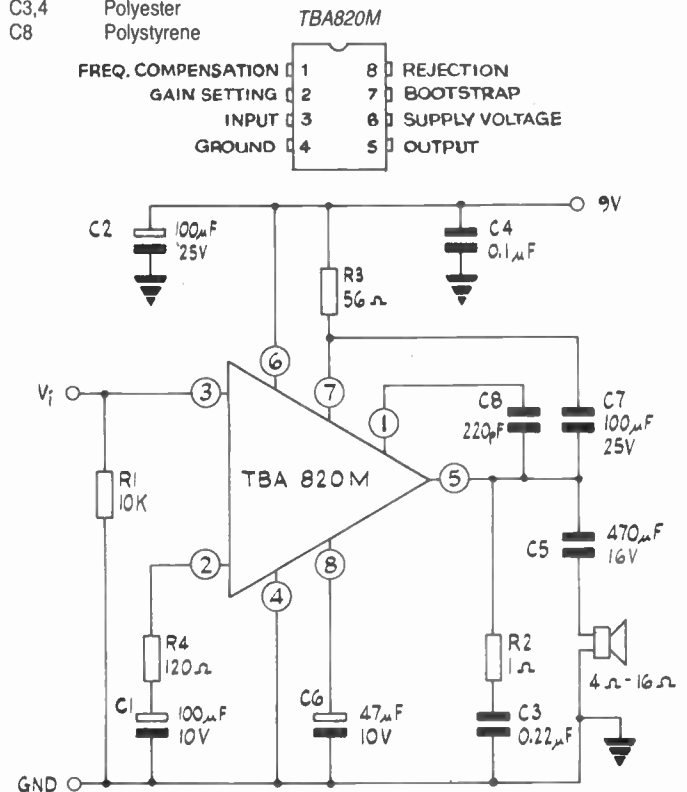
A dual audio power amp designed for very low voltage operation. The LM831 has two independent amplifiers for stereo or higher power bridge operation. The circuits shown operate from two 1.5V cells. The IC has very low noise and distortion and r.f. radiation is very low so that it can be used in close proximity to an AM receiver. The pcb should be laid out with large earth planes and the capacitor on pin 9 should be as close to the IC as possible with the value shown being the smallest permissible. Larger values improve low battery performance and can be up to 10,000 μ F. The 0.33 μ F capacitors should also be close to the IC.



TBA820M

A very useful audio amp in an 8-pin DIL package. The IC features a very low minimum working supply voltage of 3V, low quiescent current, good ripple rejection, no crossover distortion and low power dissipation. Max. supply voltage is 16V into 16 Ω speaker, 12V into 8 Ω and 9V into 4 Ω .

R1 to R4: Min Res
C1,2,5,6,7: Axial or PC Elect
C3,4: Polyester
C8: Polystyrene

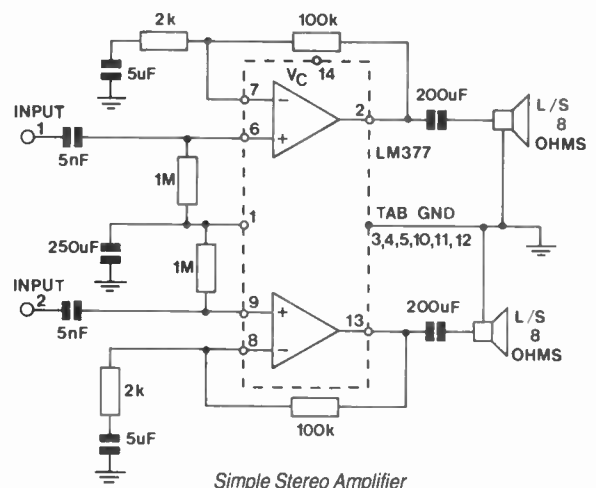
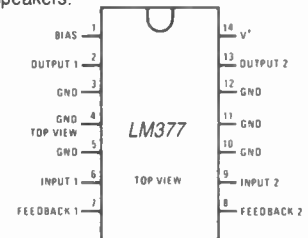


Order

WQ63T (TBA820M) 74p

LM377

A stereo amplifier in a 14-pin DIL package that requires very few external components to make a complete 2W per channel power amplifier. The IC is suitable for use with 8 Ω or 16 Ω speakers.



Order

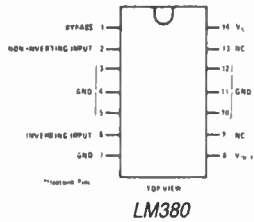
QH38R (LM377) £2.98

Order

RA78K (LM831N) £3.65

LM380

An audio amp in a 14-pin DIL package that requires very few external components to make a complete 2.5W power amplifier. In most cases, however, it is advisable to add a Min Res 2.7Ω and Polyester 0.1μF in series from pin 8 to ground and an Axial 4.7μF from pin 1 to ground.

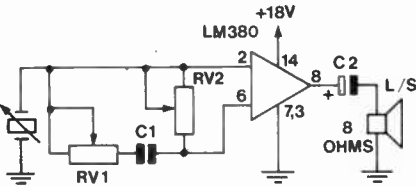


High-Output-Crystal-Cartridge Power Amp

A 2.5W rms power amp the LM380 is shown in the circuit driven by a high output crystal pickup. The IC requires only 4 other components (without tone control only two other components! — simply omit C1 and RV1).

Component list

- RV1: Pot Lin 2M
- RV2: Pot Log 2M
- C1: Polystyrene 3300pF
- C2: Axial 470μF 25V
- IC: LM380

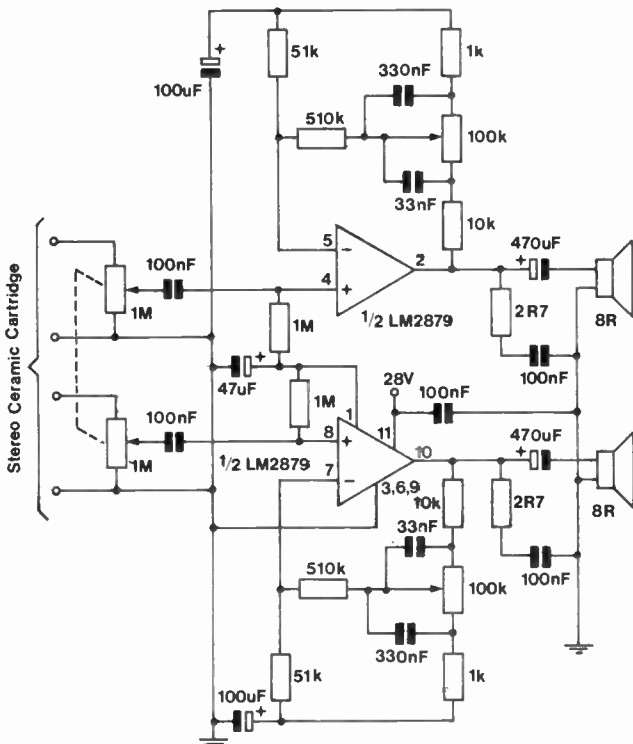
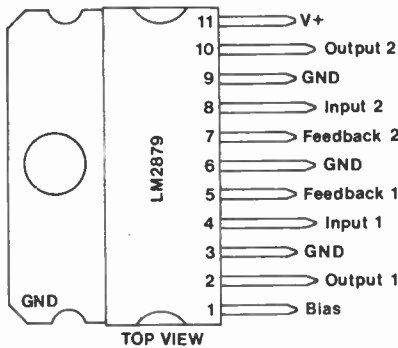


Order

QH40T (LM380) £1.09

LM2879

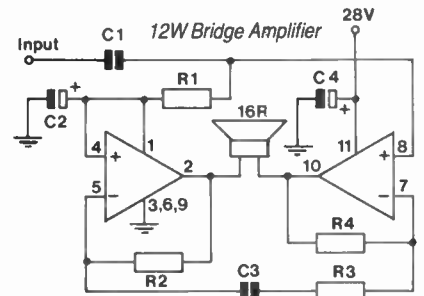
A stereo amplifier in an 11-pin power package. The device will deliver up to 9W per channel into an 8Ω load. The device contains internal current limiting and thermal shutdown.



7W per Channel Stereo Ceramic Cartridge Amplifier
(Bass control gives ±13dB at 100Hz)

Parts List

- R1: Min Res 100k
- R2: Min Res 1M
- R3: Min Res 10k
- R4: Min Res 1M
- C1: Polyester 0.1μF
- C2: Axial 220μF 16V
- C3: Polyester 0.47μF
- C4: Axial 100μF 40V



Order

QH39N (LM2879) £2.95

LM384

An audio amp in a 14-pin DIL package that is a high voltage version of the LM380. To make a simple 5W amplifier use the circuit shown for the LM380, but with a supply voltage of 22V, and a Polyester 0.1μF between pin 14 and ground.

Order

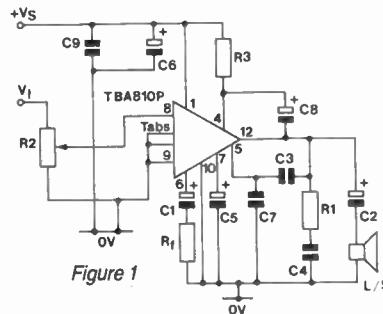
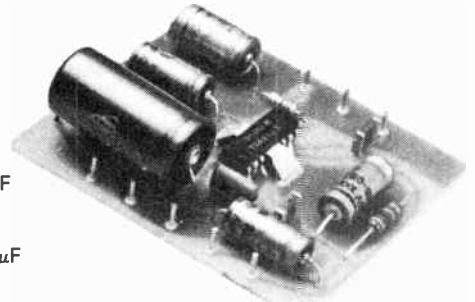
WQ34M (LM384) £2.95

TBA810P

An audio amp IC which is an updated version of the TBA810S having a higher power output, lower noise, protection against polarity inversion, higher supply voltage rejection. It can provide 7W into a 2Ω load at 14.4V supply voltage with very low harmonic and crossover distortion.

Parts List

- R1: Min Res 1Ω
- R2: Pot Log 470k
- R3: Min Res 100Ω
- Rf: Min Res 68Ω
- C1: Axial 100μF 10V
- C2: Axial 1000μF 16V
- C3: Poly Layer 0.001μF
- C4: Polyester 0.1μF
- C5,6: Axial 100μF 25V
- C7: Poly Layer 0.0047μF
- C8: Axial 100μF 25V
- C9: Polyester 0.1μF

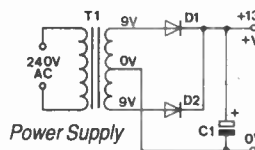


A printed circuit board is available with component designations marked. The board does not include the tone control or power supply circuits

Component List For Passive Tone Control Circuit

- R1: Min Res 22k
- R2: Pot Log 100k
- R3: Min Res 1k
- R4: Min Res 5k6
- R5: Pot Log 100k
- C1: Polyester 0.015μF
- C2: Polystyrene 1000pF
- C3: Polyester 0.15μF
- C4: Polyester 0.01μF

If using this tone control change R2 in Fig.1 to a Pot Log 100k.

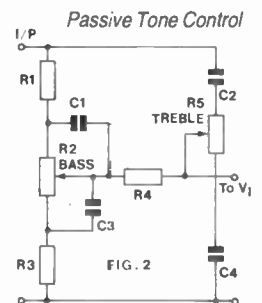


Order

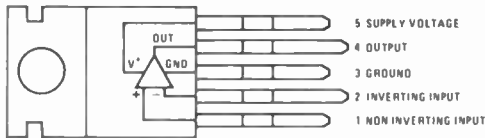
QL13P (TBA810P) £1.45
BR02C (5W Amp PCB) £1.85

Power Supply Component List

- T1: Min Tr 9V
- D1,2: 1N4001
- C1: Axial 4700μF 25V



LM383 (TDA 2003)



A high quality audio op amp that is pin compatible with the TDA2002A, but offering lower noise and improved frequency response. The amp is supplied in a 5-pin TO220 package that does not require insulating washers between the metal tab and the heatsink. To mount correctly simply smear with silicone grease and bolt directly to the heatsink. The IC will supply up to 11W into 1.6Ω loads with $V_S = 20V$, but take care that power dissipation limits are not exceeded and that transients on the supply do not take V_S above 25V. An application circuit for this IC is shown on page 246.

Order

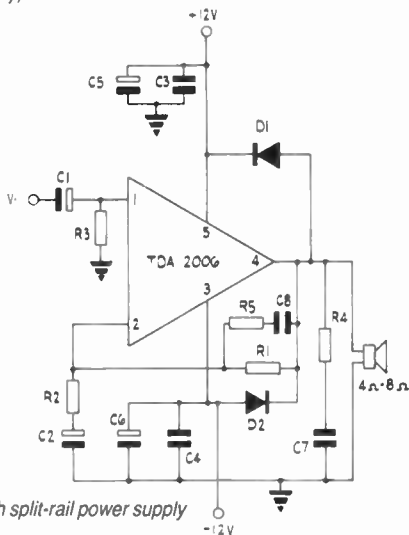
WQ33L (LM383) £2.95

TDA2006

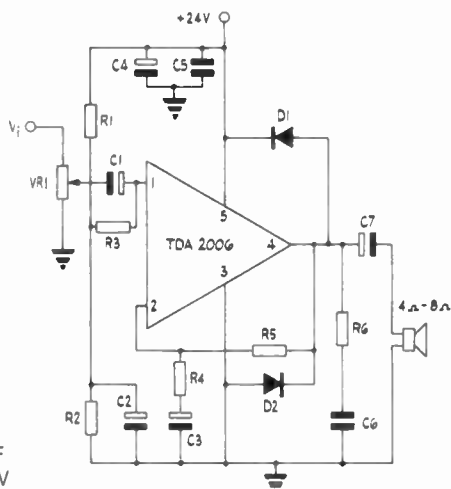
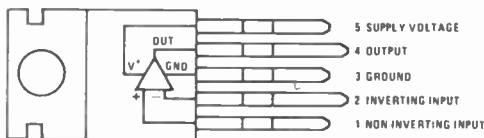
A high quality audio amp in a 5-pin TO220 package that does not require insulating washers between the metal tab and the heatsink. To mount correctly simply smear with silicone grease and bolt directly to the heatsink. The amp will operate with single or split power supplies. The distortion up to 8W with 4Ω load or 4W with 2Ω load is less than 0.1% (typically).

Parts List

- R1: Min Res 22k
- R2: Min Res 680Ω
- R3: Min Res 22k
- R4: Min Res 1Ω
- R5: Min Res 1k8
- C1: Axial 1μF 63V
- C2: Axial 22μF 25V
- C3,4: Polyester 0.1μF
- C5,6: Axial 100μF 25V
- C7: Polyester 0.22μF
- C8: Polystyrene 220pF
- D1,2: 1N4001



Typical application with split-rail power supply



Typical application with single-rail power supply

Parts List

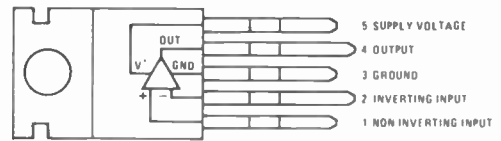
- R1,2,3: Min Res 100k
- R4: Min Res 4k7
- R5: Min Res 150k
- R6: Min Res 1Ω
- RV1: Pot Log 22k
- C1: Axial 1μF 63V
- C2: Axial 22μF 25V
- C3: Axial 2.2μF 63V
- C4: Axial 100μF 40V
- C5: Polyester 0.1μF
- C6: Polyester 0.22μF
- C7: Axial 2200μF 25V
- D1,2: 1N4001

Order

WQ66W (TDA2006) £2.95

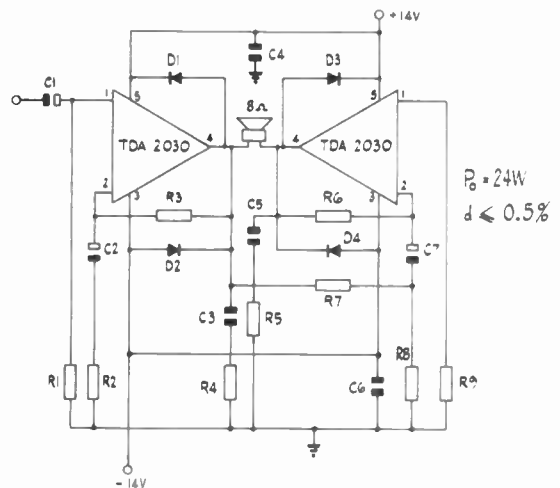
TDA2030

A high quality audio amp in a 5-pin TO220 package that does not require insulating washers between the metal tab and the heatsink. To mount correctly simply smear the metal tab with silicone grease and bolt directly to the heatsink. The amp will operate with single or split supplies. The distortion up to 12W into 4Ω is less than 0.2% typically (less than 0.5% up to 14W) and up to 8W into 8Ω is less than 0.1% (less than 0.5% up to 9W). The circuits shown for the TDA2006 are suitable for use with this IC, but the supply voltage should be increased to +14V and -14V (or 28V for the single supply circuit). In addition the bridge amplifier shown below will deliver 24W into 8Ω (or with TDA2006 and power supplies of +12V and -12V it will deliver 20W into 8Ω).



Parts List

- R1: Min Res 22k
- R2: Min Res 680Ω
- R3: Min Res 22k
- R4,5: Min Res 1Ω
- R6,7: Min Res 22k
- R8: Min Res 680Ω
- R9: Min Res 22k
- C1: Axial 1μF 63V
- C2: Axial 22μF 25V
- C3: Polyester 0.22μF
- C4: Polyester 0.1μF
- C5: Polyester 0.22μF
- C6: Polyester 0.1μF
- C7: Axial 22μF 25V
- D1,2,3,4: 1N4001



Bridge amplifier with split-rail power supply

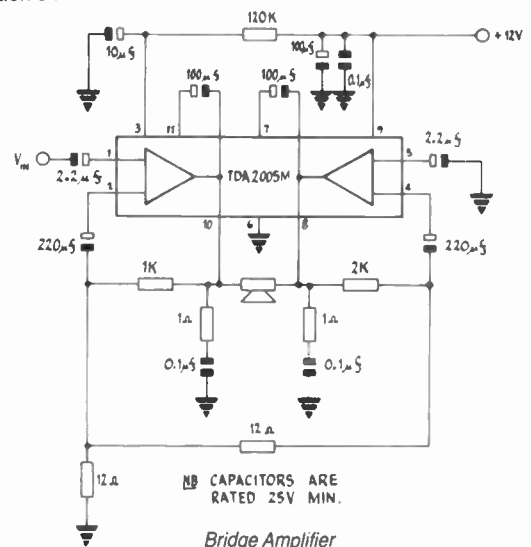
Order

WQ67X (TDA2030) £2.15

TDA2005M

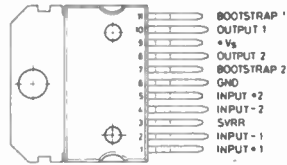
A 20W power booster IC for use in cars. The integrated circuit is fully protected against damage in use. It is protected against output short circuits across the

Application Circuit



Bridge Amplifier

speaker or to ground (AC or DC) and it protects the loudspeaker under this condition as well. It is protected against voltage surges up to 40V and it can withstand polarity reversal for longer than it would take a 2A quick blow fuse to blow. The IC consists of two power amps internally connected in a bridge configuration to achieve the high power, low voltage operation.

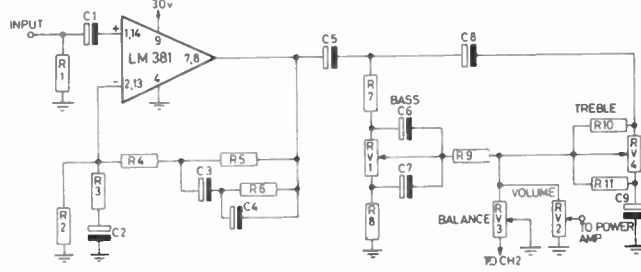
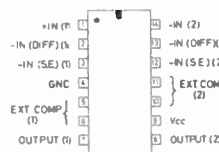


Order

YY70M (TDA2005M) £4.95

PRE-AMPLIFIER IC's LM381 Low Noise Dual Preamplifier

A stereo pre-amplifier for single rail power supplies from 8V to 40V. Features are large signal voltage gain of about 120dB, low noise input, wide power bandwidth 75kHz, and channel separation of 60dB. Circuit shows one channel of a stereo magnetic cartridge pre-amp with bass and treble controls giving 20dB boost and cut. Note that with the components shown a 30V power supply is required. The circuit is designed for magnetic input and has an RIAA response, for flat response remove R4 and R6 and replace both with links, change R5 to Min Res 100k, change C3 to polystyrene 330pF, and remove C4 and leave that position open circuit.



Component List

- | | |
|---------------------|------------------------|
| R1: Min Res 47k | C2: Axial 22µF 25V |
| R2: Min Res 100k | C3: Polystyrene 330pF |
| R3: Min Res 220Ω | C4: Polystyrene 1000pF |
| R4: Min Res 2k2 | C5: Axial 1µF 63V |
| R5: Min Res 1M2 | C6: Polyester 0.068µF |
| R6: Min Res 100k | C7: Poly Layer 0.56µF |
| R7: Min Res 5k6 | C8: Mylar 0.0022µF |
| R8: Min Res 560Ω | C9: Polyester 0.022µF |
| R9: Min Res 10k | RV1,4: Pot Lin 47k |
| R10: Min Res 82k | RV3: Pot Lin 100k |
| R11: Min Res 8k2 | RV2: Pot Log 47k |
| C1: Polyester 0.1µF | IC: LM381 |

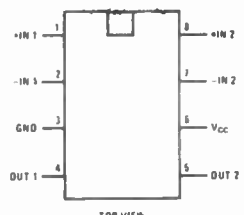
A printed circuit board is available

Order

QH41U (LM381) £2.50
BR04E (LM381 PCB) £2.45

LM387 Low Noise Dual Preamplifier

A stereo pre-amplifier in an 8-pin DIL package similar to LM381, but it will only operate up to 30V and the input noise is slightly higher.

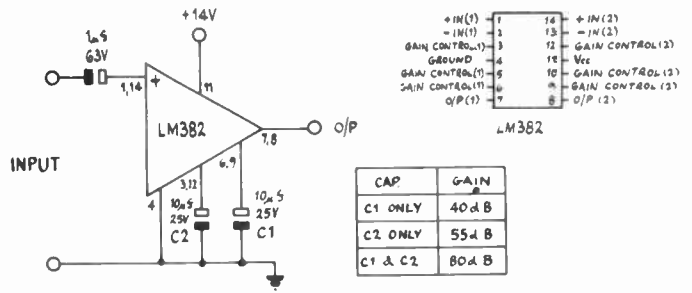


Order

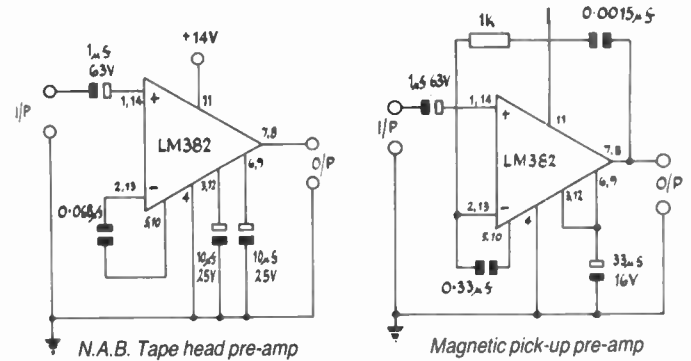
WQ35Q (LM387) £1.38

LM382 Low Noise Dual Preamplifier

A stereo preamplifier for single rail power supplies from 9V to 40V. Similar to LM380, but with on-chip resistors to considerably reduce the number of external components required.



Flat response, variable gain

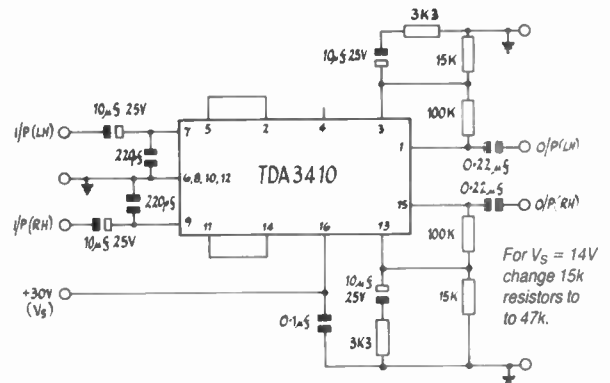


Order

YY84F (LM382) £1.49

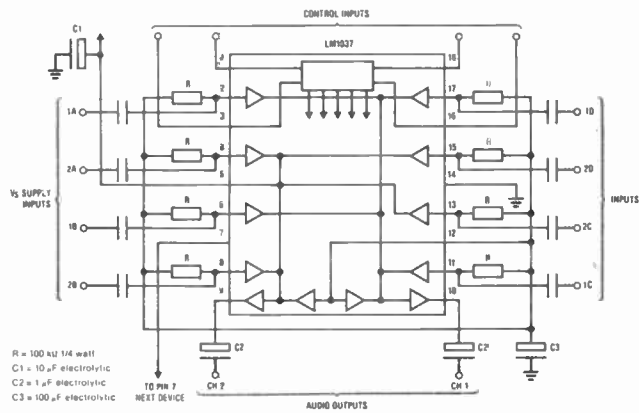
TDA3410 Ultra Low Noise Dual Preamplifier

A very low noise, low distortion, high gain stereo preamplifier with a wide supply voltage range. The IC has two separate amplifiers for each channel. The first has a fixed gain of 30dB (x32) and a maximum output voltage swing of ±2V. Therefore the input voltage must not exceed 63mV peak-to-peak or 23mV rms. The output of the first amplifier on pin 5 (11) must be connected externally to pin 2 (14), the input of the second amplifier. The gain of this amplifier may be set as for a normal op-amp and for gains up to 30dB the power bandwidth exceeds 22kHz. In the circuit shown here, the overall gain is 60dB thus with an input of 350µV rms, the output will be 350mV rms (1V peak-to-peak) into a 20kΩ load and there is still an excellent overload capability and a remarkably good signal to noise ratio of better than 60dB with a low impedance source. The frequency response is 25Hz to 20kHz ±0.5dB and the distortion is less than 0.05% over the audio band. If a higher input voltage is required in addition, in the circuit shown an input of 11mV rms at pin 2 (14) will result in an output of 350mV rms.



The IC also has an internal switch and if pin 12 is taken above 4V then input pins 7 and 9 are clamped to ground and input pins 6 and 10 are enabled. In the circuit shown here pins 6 and 10 could have been connected to another input source and either selected by switching pin 12 between ground and Vs. The IC also has its own internal voltage regulator in order to achieve very high supply voltage rejection and the reference voltage 55mV is brought out to pin 4. This could be used to bias the second amp by connecting a 22k resistor between pins 2 (14) and 4.

Continued on next page.



Channel Selection	Taking control pin high	Connects this pin to pin 10	pin 9
	1	11	13
	3	17	15
	16	2	4
	18	6	8

Characteristics

Supply voltage range: 5V to 28V
 Supply current: $V_S = 12V$ 6.4mA; $V_S = 30V$ 10mA
 Signal handling: $V_S = 12V$ 2.9V rms
 Total harmonic distortion: (1V rms) 0.04%
 Noise voltage at output: 5µV
 Channel separation: -95dB
 Relative unselected output: -90dB

Order

QY33L (LM1037N) £3.95

LMC835 Digitally Controlled Graphic Equaliser

A monolithic digitally controlled CMOS graphic equaliser allowing direct microprocessor control of an analogue signal path. With this chip it is possible to build extremely high quality computer-controlled audio graphic equalisers. Features include $\pm 6dB$ or $\pm 12dB$ cut and boost in 25 steps, 3-wire microprocessor interface and fast programming speed. Typical performance specifications are 0.0015% distortion, 114dB signal-to-noise ratio and 20dB of headroom, relative to a 1V rms input. One chip will build a 7-channel stereo equaliser or a 14-channel mono, while two chips make a 14-band stereo equaliser and four chips are sufficient to implement a $\frac{1}{3}$ octave equaliser for professional applications. Each band requires an external op-amp gyrator and the LM833 is recommended for optimum performance. Programming of each band is accomplished by two 8-bit words clocked serially into pin 16. Since the clock can be up to 500kHz, it is easily possible to program each complete chip over 1800 times in one second! The first three bits (see Table 1) select the band: 1 to 7 (8 to 14) or no band, and the fourth bit if low denotes bands 1 to 7 or if high, 8 to 14. The fifth bit if low selects $\pm 12dB$ range for bands 8 to 14 and if high, $\pm 6dB$ range. The sixth bit does the same for bands 1 to 7. The seventh bit is unused and may be high or low, and the eighth bit is high to denote the end of the first word. (Data is loaded D0 first). One complete cycle of the clock is the same length as one bit. Once the word is complete, the strobe line is pulsed low to latch the word and the second data word can now begin. The first six bits (see Table 2) set one of 12 steps of boost or cut, or a flat response if all low. The seventh bit if high gives a boost and if low gives a cut, and the eighth bit is low to denote the end of the second word. Of course, any combination of lows and highs on the first six bits may be made, but only those shown in Table 2 give precise 1dB (or $\frac{1}{2}$ dB) steps.

NEW

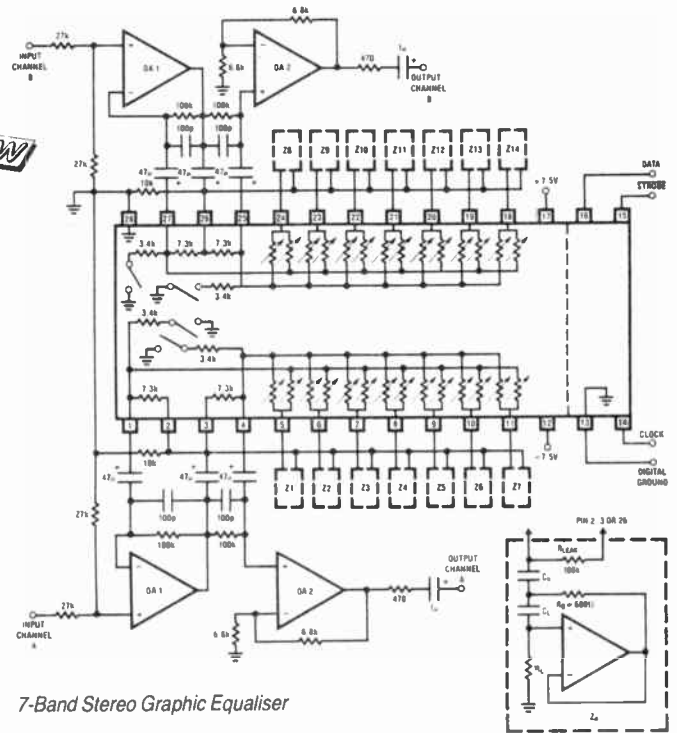
Table 1. First Four Bits of First Word

D0	D1	D2	D3 low	D3 high
L	L	L	No band selected	Band 8
H	L	L	Band 1	Band 9
L	H	L	Band 2	Band 10
H	H	L	Band 3	Band 11
L	L	H	Band 4	Band 12
H	L	H	Band 5	Band 13
L	H	H	Band 6	Band 14
H	H	H	Band 7	No band selected

Table 2. First Six Bits of Second Word

D0	D1	D2	D3	D4	D5	*	D6 high	D6 low
L	L	L	L	L	L	Flat	boost	cut
L	L	L	L	L	H	1dB	boost	cut
L	L	L	L	H	L	2dB	boost	cut
L	L	L	H	L	L	3dB	boost	cut
L	L	H	L	L	L	4dB	boost	cut
L	H	L	L	L	L	5dB	boost	cut
L	H	L	L	H	L	6dB	boost	cut
L	H	L	H	L	L	7dB	boost	cut
L	H	H	L	L	L	8dB	boost	cut
H	L	L	L	L	L	9dB	boost	cut
H	L	L	H	L	L	10dB	boost	cut
H	L	H	L	L	L	11dB	boost	cut
H	H	L	L	L	L	12dB	boost	cut

*These values are halved if bits 5/6 in word 1 were high.



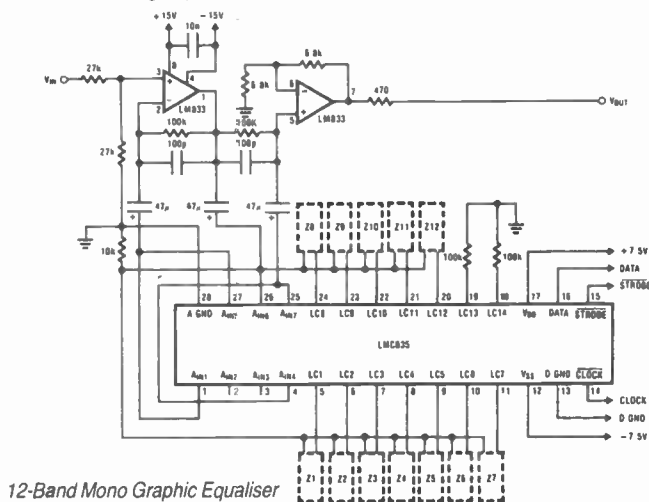
7-Band Stereo Graphic Equaliser

Gyrator Circuit

Table 3. Typical Component Values for 7-Band Mono and 12-Band Stereo Application Circuits

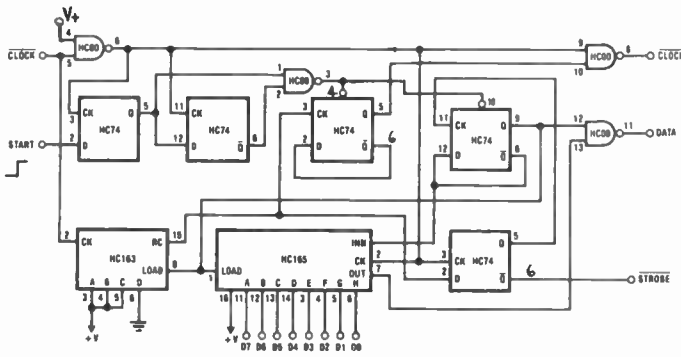
f_0 = suggested centre frequencies.

	f_0	C_0	C_L	R_L	R_0
7-Band	16Hz	3.3µF	0.47µF	100kΩ	680Ω
	31.5Hz	1.5µF	0.22µF	110kΩ	680Ω
63Hz	63Hz	1µF	0.1µF	100kΩ	680Ω
	125Hz	0.39µF	0.068µF	91kΩ	680Ω
160Hz	250Hz	0.47µF	0.033µF	100kΩ	680Ω
	400Hz	0.22µF	0.033µF	82kΩ	680Ω
1kHz	500Hz	0.1µF	0.015µF	100kΩ	680Ω
	1kHz	0.047µF	0.01µF	82kΩ	680Ω
2.5kHz	2kHz	0.022µF	0.0047µF	91kΩ	680Ω
	2.5kHz	0.022µF	0.0033µF	82kΩ	680Ω
6.3kHz	4kHz	0.01µF	0.0022µF	110kΩ	680Ω
	6.3kHz	0.01µF	0.0015µF	62kΩ	680Ω
16kHz	8kHz	0.0068µF	0.001µF	82kΩ	680Ω
	16kHz	0.0033µF	680pF	62kΩ	680Ω
	32kHz	0.0015µF	470pF	68kΩ	510Ω



12-Band Mono Graphic Equaliser

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.



A word generator to drive the data inputs of the LMC835 is shown. This could be to an 8-bit parallel port or to toggle switches.

With microprocessor control, a pink noise generator and a microphone automatic equalisation and memorising often used equalisation settings are possible.

Specification (Typical at $\pm 7.5V$, pin 13 = pin 28 = 0V)

- Supply voltage pin 17: 7.5V (2.5V to 8V)
- pin 12: $-7.5V$ ($-2.5V$ to $-8V$)
- High level input voltage (pins 14, 15, 16): 1.8V min.
- Low level input voltage (pins 14, 15, 16): 0.9V max.
- Clock frequency (pin 14): 2MHz max.
- Supply current (pins 14, 15, 16 low): 0.01mA
- (pins 14, 15, 16 high): 1.3mA (pin 17)
- :0.9mA (pin 12)
- Gain error: 0.2dB max.
- Total harmonic distortion: 0.0015%
- Signal to noise ratio: 114dB
- Switch leakage current: 50nA max.

Order

RA79L (LMC835N) £19.95

LM1818 Audio Tape System

The IC contains all the active components necessary for a complete tape deck excluding the bias oscillator. Functions included are microphone and playback pre-amp, record and playback amp, meter drive circuit, automatic input level control and electronic switching between record and playback modes. An application circuit showing construction of a complete stereo or mono hi-fi tape-deck is shown in the data sheet price 40p. For the circuit a bias oscillator block is available.

Order

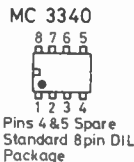
YY85G (LM1818) £1.95
YK80B (724BOR1078N Bias Mod) £2.95

MC3340P Electronic Attenuator

The MC3340P is an electronic attenuator designed for use in DC operated volume controls, compression and expansion amplifiers. It may be used as a voice operated fader on discothèques. Control can be by external potentiometer or DC voltage.

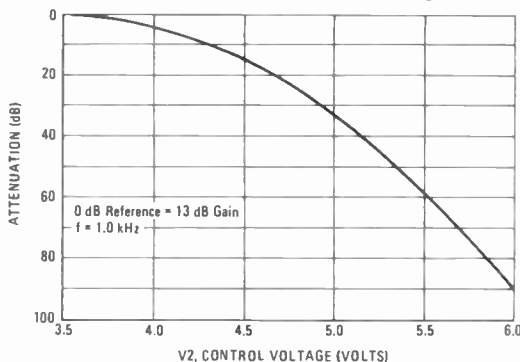
Characteristics

- Power supply voltage (V_{CC}): +9V (min)
- +18V (max)
- Control pin sink current max: 2mA
- Maximum input voltage: 0.5V rms
- Voltage gain (typical): 13dB
- Attenuation range (typical): 90dB
- Total harmonic distortion (typical): 0.6%

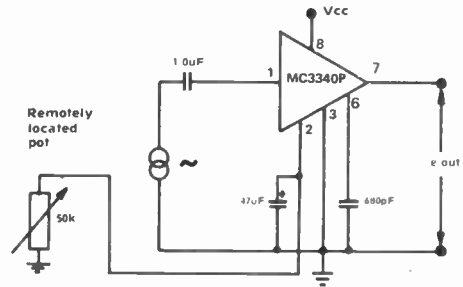
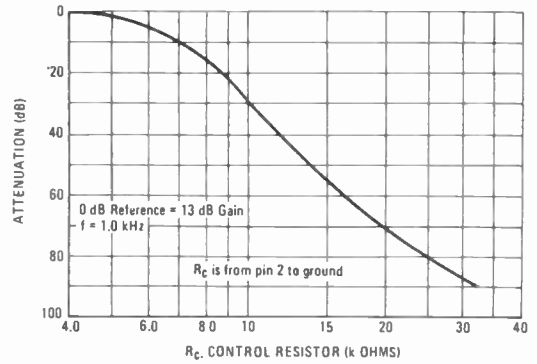


Typical Electrical Characteristics ($V_{CC} = 16V$ DC, $T_A = +25^\circ C$).

Attenuation versus DC Control Voltage



Attenuation versus Control Resistor



Order

QH49D (MC3340P) £2.45

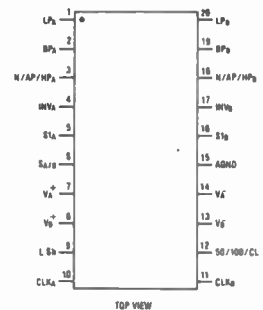
MF10C Universal Monolithic Switched Capacitor Filter

Two independent general purpose CMOS active filter building blocks each requiring just the addition of 3 to 4 resistors and an external clock to produce various 2nd order functions. Each block has three output pins. One of the outputs can be configured to perform either an allpass, highpass, or a notch function. The other two pins perform lowpass and bandpass functions. The centre frequency of the lowpass and bandpass 2nd order functions can be either directly dependent on the clock frequency or they can depend on both clock frequency and external resistor ratios. The centre frequency of the notch and allpass functions is directly dependent on the clock frequency while the highpass centre frequency depends on both resistor ratio and clock.

Up to 4th order functions can be performed by cascading the two 2nd order building blocks in each MF10C. Higher than 4th order functions can be obtained by cascading MF10C packages. Any of the classic filter configurations (such as Butterworth, Bessel, Cauer and Chebyshev) can be formed.

Characteristics (typical)

- Recommended supply voltage: +5V ($\pm 4V$ to $+7V$ max)
- Frequency range: 30kHz
- Clock to centre frequency ratio: 49.94 (pin 12 high)
- 99.35 (pin 12 at mid V_S)
- Q accuracy: $\pm 2\%$
- Centre frequency temperature: $\pm 10\text{ppm}/^\circ C$ (pin 12 high)
- coefficient: $\pm 100\text{ppm}/^\circ C$ (pin 12 at mid V_S)
- Q temperature coefficient: $\pm 500\text{ppm}/^\circ C$
- DC low pass gain accuracy: $\pm 2\%$ max
- Crosstalk: 50dB
- Clock feedthrough: 10mV
- Maximum clock frequency: 1.5MHz
- Power supply current: 8mA
- Voltage swing (pins 1, 2, 3, 9, 18, 20): $\pm 3.7V$
- Output short circuit current: 3mA source, 1.5mA sink
- Op-amp unity gain bandwidth: 2.5MHz
- Op-amp slew rate: 7V/ μs



Order

QY35Q (MF10CN) £3.45

MUSIC & SOUND GENERATOR IC's

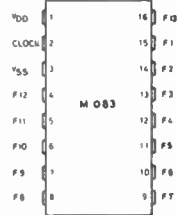
M083 Top Octave Generator

A digital tone generator that produces 13 frequencies from C to C on 13 separate output terminals. The device operates from one +12V supply and the clock frequency can be as high as 4.5MHz. The outputs will sink or source up to 0.7mA.

Pin	Function	4MHz Input	2MHz Input	Equal-temp- ered scale	Error
1	+12V	—	—	—	—
2	Input	4.00048MHz	2.00024MHz	—	—
3	0V	—	—	—	—
4	C#	8870.2Hz	4435.1Hz	4435.0Hz	+0.002%
5	D	9390.8Hz	4695.4Hz	4698.6Hz	-0.068%
6	D#	9951.4Hz	4975.7Hz	4977.2Hz	-0.032%
7	E	10,555.4Hz	5277.7Hz	5273.9Hz	+0.072%
8	F	11,174.5Hz	5587.3Hz	5587.7Hz	-0.007%
9	F#	11,835.7Hz	5917.9Hz	5920Hz	-0.035%
10	G	12,540.7Hz	6270.3Hz	6272Hz	-0.027%
11	G#	13,290.6Hz	6645.3Hz	6645Hz	+0.005%
12	A	14,086.2Hz	7043.1Hz	7040Hz	+0.044%
13	A#	14,927.2Hz	7463.6Hz	7458.6Hz	+0.067%
14	B	15,812.2Hz	7906.1Hz	7902.1Hz	+0.051%
15	Top C	16,738.4Hz	8369.2Hz	8371.8Hz	-0.031%
16	Low C	8369.2Hz	4184.6Hz	4185.9Hz	-0.031%

Characteristics (typical)

Supply voltage (V _{DD}):	+10V to +14V (+12V typical)
Input clock low:	0V to +1V
Input clock high:	V _{DD} to V _{DD} -1V
Input clock rise and fall times:	30ns max (10% to 90%)
Input clock on and off times:	111ns
Input capacitance:	5pF
Output high voltage at max current (0.75mA):	V _{DD} -1.5V min
Output low voltage at max current (0.7mA):	V _{SS} +1V max
Output rise and fall times (500pF load):	250ns min 2.5ms max
Output duty cycle:	50%
Supply current:	24mA
Input clock frequency:	100kHz min; 4.5MHz max

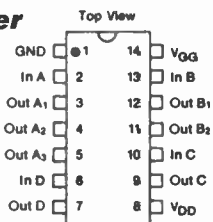


Order

YY81C (M083) £4.45

AY-1-5050 7-Stage Divider

A 7-stage MOS divider. Frequency input range DC to 1MHz. Can be driven from sine or square waves.

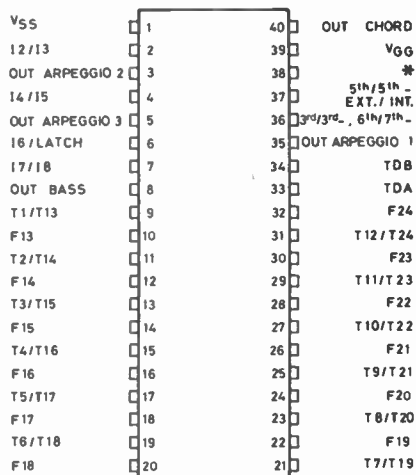


Order

HQ51F (AY-1-5050) £3.15

M251 Auto Chording

This IC is an arpeggio and bass accompaniment generator. It is designed to be used with the M254 rhythm generator.

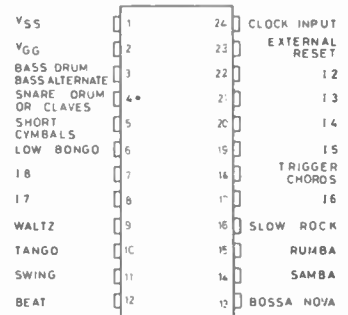


Order

HQ71N (M251) £15.95

M254 Rhythm Generator

A rhythm generator IC designed primarily for use with the M251. It can generate 8 rhythms and drive up to 12 outputs which can be instruments or inputs of the M251.



Order

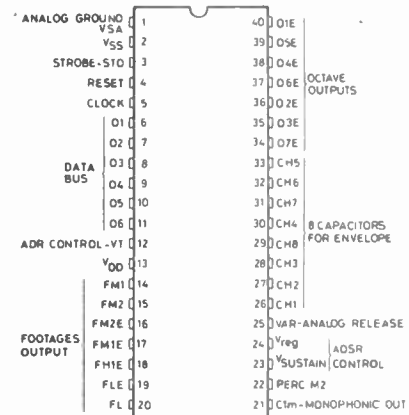
WH21X (M254) £8.95

M112 Polyphonic Sound Generator

The M112 is intended for use in a wide range of applications from simple single-keyboard organs to 2 or 3 manual instruments with sophisticated synthesis and accompaniment facilities. It is also ideal for use in electronic pianos, harpsichords, string synthesisers etc. The IC contains eight programmable sound generator channels, a top octave synthesiser, divider chain and control circuitry, as well as a microprocessor interface. Each generator consists of logic to select the desired notes and harmonics from 96 frequencies obtained from the divider chain, an ADSR envelope generator and two voltage controlled amplifiers (VCA). Programmable attenuators are also included for drawbar control of the harmonic content of the sound.

The signals are routed to two separate sets of outputs. One is a set of seven octave separated outputs so that excellent flute sounds can be generated with simple filters, whilst the other set is output by footages. Four footage outputs have controllable VCA's where the attack time, decay time, release time and sustain time can be set. There are additional footage outputs for three of the four footages which are not affected by the envelope controls. In addition a fifth footage is available for the generation of sawtooth waveforms for sound synthesis purposes.

The IC can be programmed to produce one of three ranges of footages: 16, 8, 4, 2 and 1 foot; 10²/₃, 5¹/₃, 2²/₃, 1¹/₃ and 3²/₃ foot; and 12¹/₂, 6²/₃, 3¹/₂, 1³/₄ and 1/2 foot. One or more chips can be connected to a microprocessor or home computer (though it must have a parallel I/O port of which 6 lines are used), which could either scan a conventional keyboard up to 72 keys, or could use the micro's own keyboard.



When the microprocessor detects a key depression, it chooses one of the sound generators and allocates it to that note. If another key is pressed, the microprocessor allocates another sound generator until 8 keys are in use. IC's can be chained in series to give more keys simultaneously (i.e. 2 IC's give 16 keys etc.) or in parallel to give different facilities from each chip. In practice on a multi-manual organ, 8 keys simultaneously may be sufficient for each manual, though it may be necessary to provide more on the solo for example.

Another significant feature of the M112 is the implementation of a digital drawbar system. The levels of the four footages on the octave-related outputs can be individually set to blend harmonics to produce the desired sound. Other special features of the M112 include hold, pedal and percussion effects. Hold, when active, interrupts the decay of the ADSR envelope and Pedal interrupts the release curve. Thus a very realistic piano or harpsichord sound can be generated.

The IC has 15 internal registers which are addressed by two successive 6-bit bytes on the 6 data lines. The first four bits determine which register and the remaining 8 bits carry the data. Registers 1 to 8 contain the note and octave data for each of the eight generators. Register 9 contains the parameters of the envelope control.

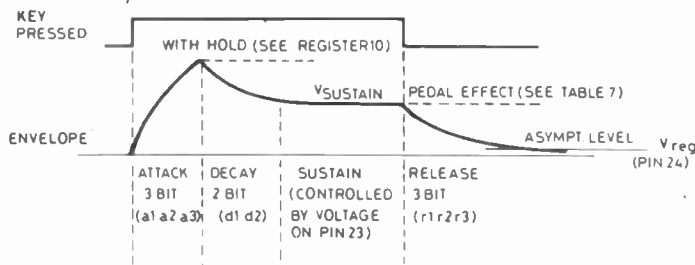
Continued on next page.

M112 Continued

Attack may be set to any one of eight times between 1.5ms and 192ms; decay may be set to one of four times between 12ms and 96ms and release can be set to one of seven times between 3ms and 192ms or it can be set to infinity so that for example the piano pedal effect can be obtained. The attack time determines how long it is after a key is pressed before full volume is reached for that key. The decay time determines how long it is after a key is released, before the level falls to that set by the voltage on the sustain: pin 23. The release time determines how long it is after sustain ends before the level falls to the point at which the channel switches off as set by the voltage on pin 24.

Each of register 10's eight data bits correspond to one of the eight channels. Any channel set to 1 is excluded from the non-enveloped footages (pins 14, 15 and 20). Only seven of register 11's eight bits are used and each one has a separate function. Two bits determine in which footage the note on channel one will be output on the monophonic first key down output: pin 21. A further two bits determine whether the chip will function in its standard mode, or in mode 2 which is designed for sawtooth generation, or in mode 3 which is intended for sophisticated auto-accompaniment including chord generation, arpeggio, bass runs etc. The remaining 3 bits control Hold, which interrupts the decay phase of the envelope, Percussion which permits a percussive attack on 4-foot under control of a voltage on pin 22 and the final bit, when set, eliminates channel one from the enveloped footages: pins 16 to 19. Registers 12 to 15 contain the 32 step drawbars that control individually the four footages on the octave related outputs.

ADSR Envelope Control



Pin Functions

- Pin 1. Analogue ground. Normally connected to pin 2, but could be adjusted up to +1V to modify the output current and compensate for differences between several M112's used in the same instrument.
- Pin 2. V_{SS} 0V.
- Pin 3. Strobe. The first six data bits are latched on the positive edge of this signal and the second set of bits are latched on the negative edge.
- Pin 4. Reset. Can be used to synchronise chips if more than one in use. The six data bits, this pin and pin 3 would normally be controlled by the eight bits on a standard microprocessors I/O port.
- Pin 5. Clock input. Determines the frequency of the output notes and for A = 440Hz should be set to 2.00024MHz. Minimum frequency is 250kHz and maximum is 2.3MHz.
- Pins 6 to 11. Data inputs.
- Pin 12. Normally connected to pin 13. If more than one M112 is in use it may be adjusted between 0V and V_{DD} to adjust the time constant of the envelope.
- Pin 13. V_{DD} . 12V. Minimum 11.4V, maximum 12.6V.
- Pin 14. 8 foot output non-enveloped.
- Pin 15. 4 foot output non-enveloped.
- Pin 16. 4 foot output with envelope.
- Pin 17. 8 foot output with envelope.
- Pin 18. 2 foot output with envelope.
- Pin 19. 16 foot output with envelope.
- Pin 20. 16 foot output non-enveloped or with chip operating in mode 2, sawtooth generation mode, this pin carries 1 foot output with envelope. Pins 14 to 20 typically give an output of 30 μ A per key pressed.
- Pin 21. Monophonic output of channel one.
- Pin 22. Set to level between 0V and V_{DD} adjusts the volume of the percussive sound added to the 4 foot notes on the octave related outputs.
- Pin 23. Sustain. Set to a level between 0V and V_{DD} defines the level of sustain.
- Pin 24. Normally connected to V_{SS} it can be adjusted up to 1V to change the level at which a channel switches off at the end of release time.
- Pin 25. Normally connected to V_{SS} it can be adjusted up to V_{DD} to permit intermediate values of release time if required in addition to the values possible under software control.
- Pins 26 to 33. Connect 8 capacitors of 1 μ F each between each pin in turn and ground. The value sets the time constant for the envelope on each channel separately.
- Pin 34. Octave 7 output, 4186 to 7902Hz.
- Pin 35. Octave 3 output, 261 to 493Hz.
- Pin 36. Octave 2 output, 130 to 246Hz.
- Pin 37. Octave 6 output, 2093 to 3951Hz.

- Pin 38. Octave 4 output, 523 to 987Hz.
- Pin 39. Octave 5 output, 1046 to 1975Hz.
- Pin 40. Octave 1 output, 32 to 123Hz. Pins 34 to 40 typically give 300 μ A per key pressed with drawbar at maximum.

Characteristics (typical)

	Min.	Typ.	Max.	Unit
Supply voltage V_{DD}	11.4	12	12.6	V
Supply current I_{DD}			50	mA
Input high voltage (pins 3, 6 to 11) (other inputs)	2.4		V_{DD}	V
Input low voltage (pins 3, 6 to 11) (other inputs)	-0.3		0.8	V
Analogue ground (R<10 Ω , C=100 μ F)	0	0	1	V
Pin 12 (R=1k, C=1 μ F)	0		V_{DD}	V
Pin 25 (R=10k, C=0.1 μ F)	0		V_{DD}	V
Pin 24 (R<10 Ω , C=100 μ F)	0	0	1	V
Pin 23 (R=1k, C=100 μ F)	0		V_{DD}	V
Pin 22 (R=10k)	0		V_{DD}	V

Order

YH86T (M112) £18.95

M108 Single-Chip Organ

A complete organ and accompaniment on one IC. Features include:
Simple key switch requirements for 61 keys in a matrix of 12 x 6.
Fully polyphonic operation.
Two keyboard formats, 61 keys (solo) or 24+37 keys (accompaniment+solo with automatic chording in the accompaniment section).
Three footages generated with separate outputs.
Several chips can be used together and synchronised through the reset input.
Internal anti-bounce circuits.
Key-down and trigger outputs for solo, accompaniment and bass sections.
Sustain for last key released in the solo section.

Choice of operating modes in the accompaniment section.

1. Manual — with or without memorisation of the selected keys (free chords with alternating bass).
 2. Automatic — with or without memorisation of the selected key (priority to the left for automatic chords and bass arpeggio).
- Multiple choice possibility on the chords in automatic mode — major or minor third
— with or without seventh
Standard single +12V power supply at 30mA

Order

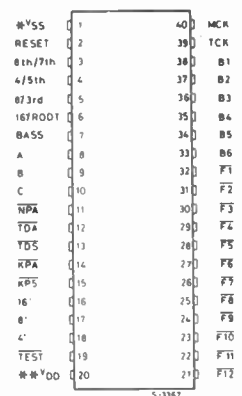
YY90X (M108) £9.95

M147 13-Note Latch Pedal Sustain

A 13-note pedal sustain IC for use with 13-note pedalboards. The IC features: Priority to the first left pedal. Output remains on until next pedal pressed. Trigger output for envelope circuits.
Choice between two input frequencies (2,00024MHz or 500.06Hz). Antibounce internal circuit for both touch and release. The chip has 13 pins for input pedals, five outputs that come on simultaneously for 16ft, 8ft, 4ft, 2ft and 1ft (the higher frequencies are provided so that mixtures can be made, to give very rich bass tones), an input pin for the master frequency, one pin for trigger sustain output which is activated only when one or more pedals are depressed, one pin for trigger percussion which supplies a pulse whenever a pedal with priority is first pressed, or when two pedals are pressed. The chip also has a mode select pin, which when connected to 0V allows the input frequency to be 500.06kHz, and when connected to -17V allows the input frequency to be 2,00024MHz.

Order

YY91Y (M147) £7.95

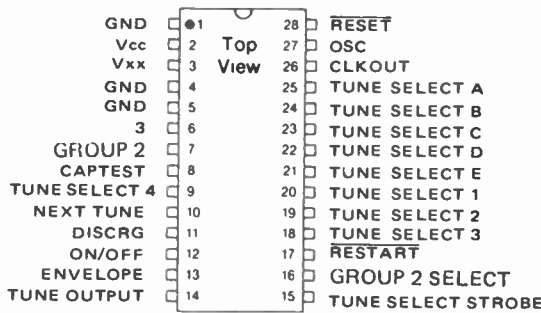


* V_{SS} is the lowest supply voltage
** V_{DD} is the highest supply voltage

AY-3-1350 Tunes Synthesiser

The chip is pre-programmed with 25 different tunes and three chimes as follows:

A0	Toreador	E2	Augustine
B0	William Tell	A3	O Sole Mio
C0	Hallelujah Chorus	B3	Santa Lucia
D0	Star Spangled Banner	C3	The End
E0	Yankee Doodle	D3	Blue Danube
A1	John Brown's Body	E3	Brahm's Lullaby
B1	Clementine	A4	Hell's Bells
C1	God Save The Queen	B4	Jingle Bells
D1	Colonel Bogey	C4	La Vie En Rose
E1	Marseillaise	D4	Star Wars
A2	America, America	E4	Beethoven's 9th
B2	Deutschland Leid	Chime X	Westminster Chime
C2	Wedding March	Chime Y	Simple Chime
D2	Beethoven's 5th	Chime Z	Descending Octave Chime

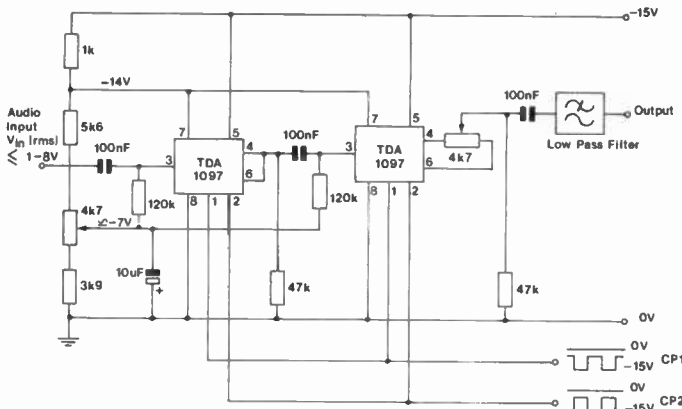


The IC requires only a few external components and features an automatic switch-off signal at the end of a tune for power saving. There is an envelope control to give organ or piano quality. The chip can be operated with an external EPROM so that you can record and play back tunes of your choice.

Order

YY89W (AY-3-1350) £4.95

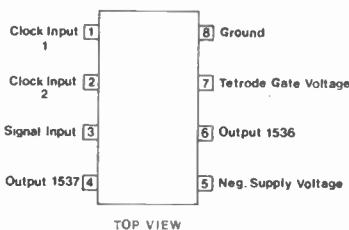
TDA1097 Bucket Brigade Delay Line (1536-Stage)



An analogue delay line IC that will delay audio signals by between 153.6ms and 7.68ms depending on clock frequency. The circuit shows two IC's cascaded, though any number could be used. If only one IC is to be used then pins 4 and 6 are connected as the second IC in the circuit.

Specification

Negative supply voltage (V_{DD}): -12V to -16V
 Tetrode gate voltage: 1V higher than V_{DD} (e.g. -14V if V_{DD} -15V)
 Clock frequency: 5kHz to 100kHz
 Clock voltage: 0V (1.5V max) to V_{DD} (50% duty cycle)
 Signal input frequency: <0.3 x clock frequency or 25kHz
 Input bias voltage: -6V to -8V (adjust for minimum distortion)
 Max input voltage: 1.5V rms
 Signal to noise ratio: 77dB



Order

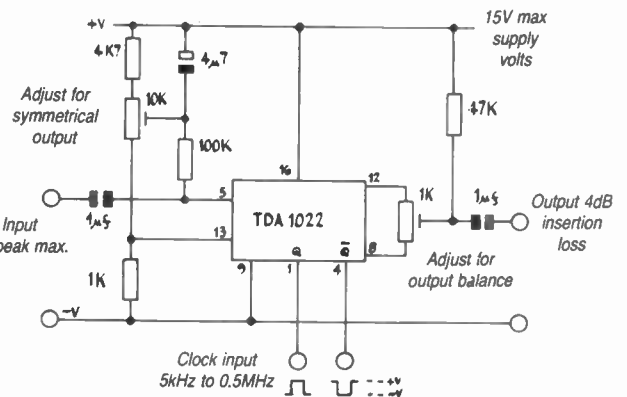
RA80B (TDA1097) £6.95

TDA1022 Bucket Brigade Delay Line (512-Stage)

An analogue delay line IC that will delay audio signals by between 51.2ms and 0.853ms, depending on clock frequency. Applications include reverberation, vibrato and chorus effects, variable compression and expansion of speech in tape recorders, communication systems for speech scrambling and time scale conversion and equalising speech delay in public address systems.

Pin Connections

1	Clock input 1	9	Negative supply (V_{DD})
2	Not connected	10	Not connected
3	Not connected	11	Not connected
4	Clock input 2	12	Output 512
5	Signal input	13	Tetrode Gate
6	Not connected	14	Not connected
7	Not connected	15	Not connected
8	Output 513	16	Ground (substrates)



Characteristics (pin 16 at 0V)

Supply voltage at pin 9:	-10V to -18V (-15V typical)
Supply current at pin 9:	0.3mA
Clock frequency at pins 1 and 4:	5 to 300kHz (Note 1)
Clock pulse levels at pins 1, 4: High:	0 to -1.5V
Low:	-10V to -18V (Note 2)
Signal input voltage at pin 5 giving 1% distortion at pins 8 and 12:	2.5V rms
Frequency of signal:	DC to 45kHz
Attenuation input to output:	4dB (typical)(Note 3)
Change in output level with 1V rms 1kHz input when clock frequency changes from 5 to 100kHz (100 to 300kHz):	0.5dB (0.5dB) typical
DC voltages shift when clock frequency changes from 5 to 300kHz	<0.5V
Noise output voltage:	0.25mV typical
Signal to noise ratio at max output voltage:	74dB
Load resistance:	>10kΩ (47kΩ typical)

Note 1. The clock frequency should never be lower than twice the highest signal frequency and it may well be necessary for it to be more than three times the highest signal frequency depending on the characteristics of subsequent circuitry.

Note 2. The pulses on pins 1 and 4 must be in antiphase (i.e. when pin 1 is high pin 4 is low and vice versa) and leading and trailing edges must not overlap. Clock low voltage should be equal to or higher (i.e. closer to 0V) than V_{DD} (pin 9) and the voltage at pin 13 should be 1V higher (i.e. closer to 0V) than clock low voltage.

Note 3. The attenuation can be reduced to around 2.5dB if the load resistor is replaced by a current source of 100 to 400μA

Note 4. A resistive divider is needed to maintain pin 5 at around 5V DC.

Order

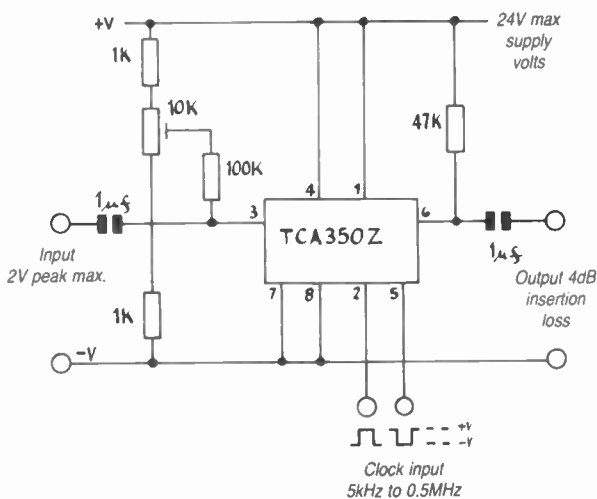
WH20W (TDA1022) £4.50

TCA350Z Bucket Brigade Delay Line (185-Stage)

An analogue delay line IC having a delay time equal to 183 divided by twice the clock frequency. Pin 3 should be set to -8V by a voltage divider and a constant current source on pin 6 supplies 0.5mA to give a high value load resistance and allow a voltage swing from +5V to -22V. However, if the input impedance of the low-pass filter exceeds 1MΩ then the constant current source can be replaced by a 22kΩ resistor. A non-overlapping two phase clock is required, connected at pins 2 and 5. The clock frequency must be at least twice the highest frequency required.

Characteristics

	Min	Typical	Max
Supply voltage (pin 7)	—	-22V	—
Clock voltage high level	1V	—	+0.3V
Clock voltage low level	-20V	-18V	-17.5V
Clock frequency	10kHz	40kHz	500kHz
$(R1 \times R2) \div (R1 + R2)$	—	—	20k Ω
Input signal amplitude (peak to peak)	0V	3V	6V
Lowpass filter input impedance	—	20k Ω	—
DC output current	0.5mA	—	1.5mA
Attenuation	—	2.5dB	5dB
Distortion	—	0.5%	3%
Noise voltage (peak to peak)	—	1.5mV	2mV



Order

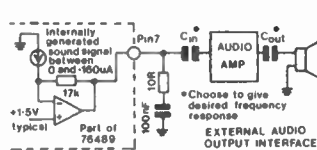
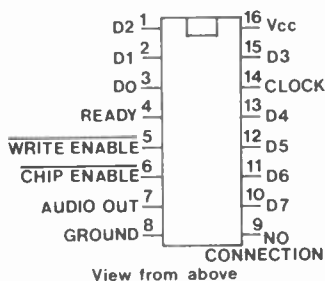
YY79L (TCA350Z) £3.95

76489 Digital Sound Generator

A complex sound generator which may be directly controlled by a microprocessor via a parallel 8-bit interface. The chip has three programmable tone generators, a programmable white noise generator and programmable attenuation.

A clock frequency of 3.579MHz should be connected to pin 14 (or any frequency up to 4MHz max). The data to set the frequency is transferred in two bytes whilst to set the noise or attenuation requires only one byte. The first bit (D0) is set to 1 except when it is the second byte of a two byte frequency set-up, in which case it is set to 0. If D0 is 1 then the 76489 assumes D1, D2 and D3 are the address of the register being changed as follows.

D1	D2	D3	Control Register
0	0	0	Frequency of Generator 1
0	0	1	Attenuation of Generator 1
0	1	0	Frequency of Generator 2
0	1	1	Attenuation of Generator 2
1	0	0	Frequency of Generator 3
1	0	1	Attenuation of Generator 3
1	1	0	Noise Control
1	1	1	Attenuation of Noise



The frequency of a tone generator is set by a ten-bit number (i.e. a number between 1 and 1023) where $f = N/32n$ where f is the frequency in Hz, N is the clock frequency in Hz and n is the 10-bit binary number in decimal.

Thus a two-byte transfer of a frequency to generator 2 for example would look like this.

Byte No.	Register Address	Data	Byte No. Used	Data
1	0 1 0	F6 F7 F8 F9	0 X	F0 F1 F2 F3 F4 F5

where F0 to F9 is the 10-bit number, F0 is the most significant bit and F9 the least significant, X indicates that this bit can be a 1 or a 0. After sending a 2nd byte (i.e. bit no. 1 is 0) subsequent 2nd bytes update the same register until another 1st byte is sent. This allows the six most significant bits to be quickly modified for frequency sweeps.

The attenuation of a generator including noise is achieved in a single byte. Thus the first bit will be a 1, the next three bits will be D1, D2, D3 to define the required attenuation register, and the remaining four define the attenuation as follows.

Bit No.	5	6	7	8	Attenuation
	0	0	0	0	0dB
	0	0	0	1	2dB
	0	0	1	0	4dB
	0	0	1	1	6dB
	0	1	0	0	8dB
	0	1	0	1	10dB
	0	1	1	0	12dB
	0	1	1	1	14dB
	1	0	0	0	16dB
	1	0	0	1	18dB
	1	0	1	0	20dB
	1	0	1	1	22dB
	1	1	0	0	24dB
	1	1	0	1	26dB
	1	1	1	0	28dB
	1	1	1	1	OFF

To control the noise generator again requires only a single byte where bit 1 is a 1, the next three bits are 110 and the 5th bit is not used (i.e. may be 1 or 0). The 6th bit if a 0 sets the generator to produce 'periodic' noise whilst a 1 sets white noise. The noise is generated by a shift register whose rate is determined by the 7th and 8th bits as follows.

Bit No.	7	8	Shift Rate
	0	0	$N \div 512$
	0	1	$N \div 1024$
	1	0	$N \div 2048$

where N is the clock frequency. If both bits are set to 1 then the output of tone generator 3 is connected to the white noise input so that frequency related noises may be created e.g. bongo drums.

To transfer data to the 76489, the controlling microprocessor should be programmed to operate as follows. First, apply 0V to pin 6, then set up the data on the 8-bit data bus, then take pin 5 to 0V. As soon as pin 5 goes negative, pin 4 will go negative. The microprocessor must now enter a wait state until pin 4 goes positive again, at which time pin 5 should be taken positive, a new byte set up on the data bus and then pin 5 taken negative again and so on. The 76489 takes 32 clock cycles to load the data which is about 9µs if the clock is 3.579MHz.

The outputs of the four attenuators are mixed together and output via a buffer amplifier on pin 7. This pin must be bypassed to ground with a Min Res 10 Ω in series with a Polyester 0.1µF. Pin 7 should then be connected via a suitable capacitor to the input of an amplifier e.g. TBA820M. The output can deliver up to about 10mA.

Characteristics (typical)

Supply voltage: 5V \pm 10%

Supply current: 30mA

All inputs and outputs (except pin 7) are TTL compatible.

Order

YH33L (76489) £5.75

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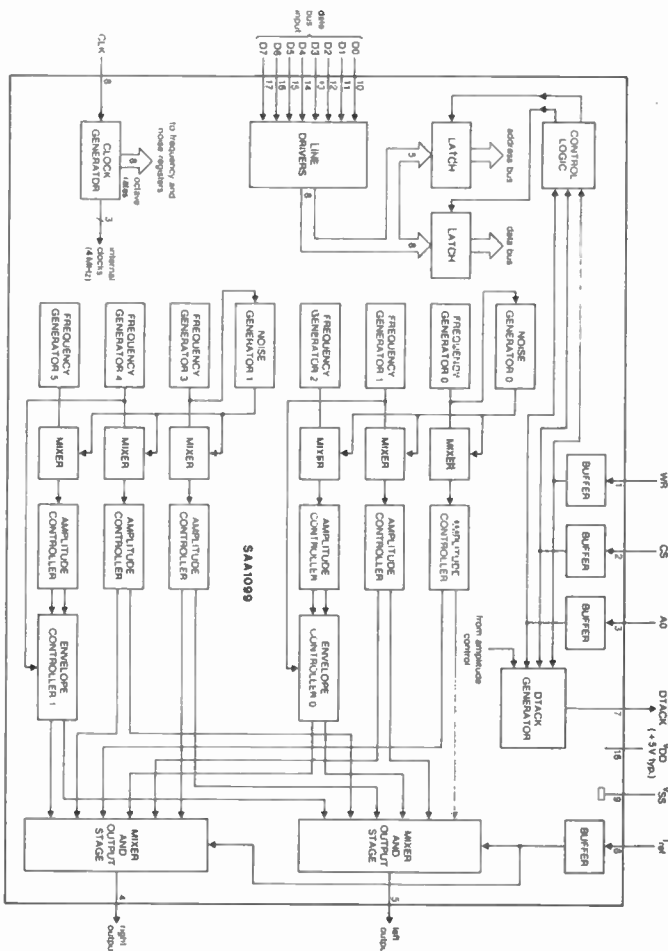
SAA1099 Stereo Sound Generator

NEW

Designed for the generation of stereo sound effects and music synthesis the IC features six independent frequency generators each having eight octaves and 256 tones per octave, two noise generators, six noise/frequency mixers, twelve amplitude controllers, two envelope controllers, two six-channel mixers/current sink analogue output stages, and TTL compatible inputs. The device has 32 internal 8-bit registers into which data is loaded to set the various functions. Full details are given in the data sheet price 40p. Pin 6 should be connected via a 10k resistor to supply and pins 4 and 5 should be connected to supply each via an 820Ω resistor. Alternatively, each output connected via 1k1 and pin 6 supplied with 250μA from a constant current source.

Specification

Supply voltage: 5V
 Supply current: 55mA
 Reference current: 250μA
 Output current one channel on: 263μA ± 25μA
 six channels on: 1.515mA ± 0.135mA
 DC leakage current all channels off: 10μA max



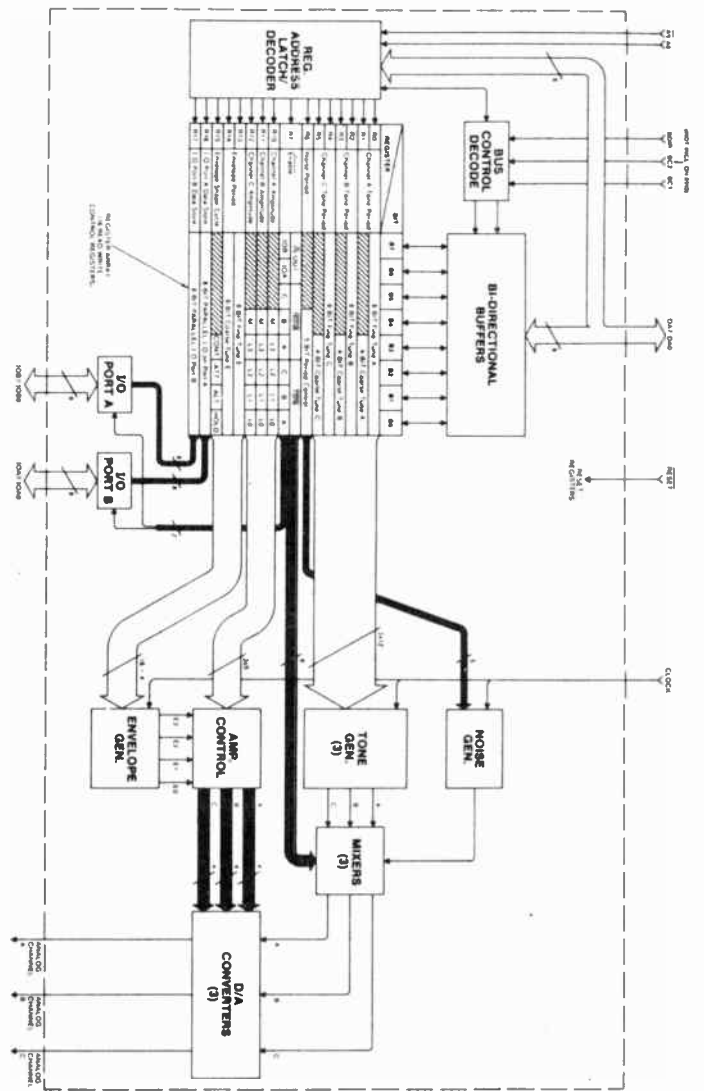
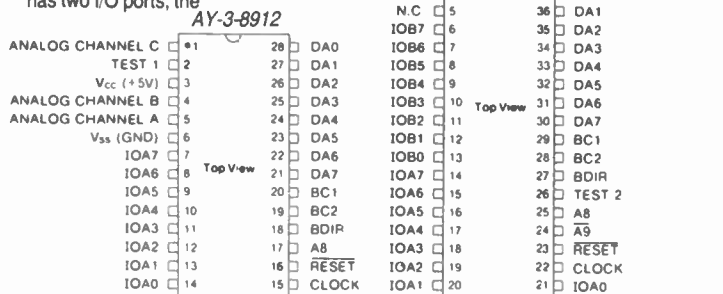
Order

RA81C (SAA1099) £5.95

AY-3-8910/2/3 Programmable Sound Generator

A microprocessor controlled sound generator which can produce a wide variety of complex sounds. The schematic diagram shows the contents of the chip which are controlled by the contents of the 16 registers from the data bus. In addition, the 40-pin DIL AY-3-8910 has two I/O ports, the

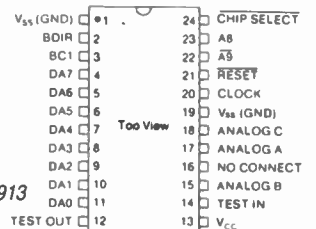
NEW



28-pin DIL AY-3-8912 has one I/O port while the 24-pin DIL AY-3-8913 has no ports.

Specification

Supply voltage: 5V
 Supply current: 45mA
 Clock input: 1 to 2MHz

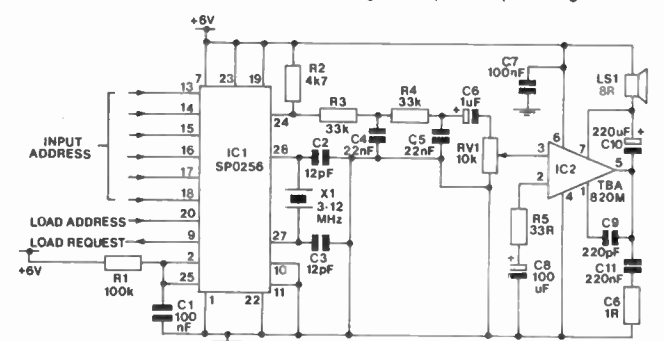


Order

RA89W (AY-3-8910) £4.50
 RA90X (AY-3-8912) £4.25
 RA91Y (AY-3-8913) £3.50

SP0256 Speech Processor

A single-chip speech synthesiser containing 64 allophones which when strung together can produce almost any sound found in the English language. The achievable output is equivalent to a flat frequency response to 5kHz, a dynamic range of 42dB and a signal to noise ratio of 35dB. The IC incorporates a digital filter that models the vocal tract; a ROM containing 64 allophones (including 5 different



Pins 3,4,5,6,8,12,21,26, not used. Circuit operates on a 6V Battery e.g. 4 x HP7.

length pauses); a micro controller which controls the data flow from the ROM to the filter, the linking of the speech elements together and the amplitude and pitch information to excite the digital filter; and a pulse width modulator that creates a digital output which is converted to an analogue signal when filtered by an external low pass filter. In practice the IC will be used with a microcomputer in order to generate the codes sequentially, fast enough so that they string together to make intelligible speech. The addresses of the allophones may be found in Maplin Project Book 6. To operate, connect levels to the six input address lines corresponding to the allophone required. Note that pin 18 is the low order bit and that a logic 1 is a voltage over 2.4V (up to V_{DD}) and logic 0 is 0V. Apply a negative pulse to pin 20 to load the address. Pin 9 will now go to logic 1. Apply the next address to the address lines and when pin 9 goes low, pulse pin 20.

Parts List

R1	Min Res 100k	C2,3	Ceramic 12pF
R2	Min Res 4k7	C4,5	Polyester 0.022 μ F
R3,4	Min Res 33k	C6	Axial 1 μ F 63V
R5	Min Res 33 Ω	C8	Axial 100 μ F 10V
R6	Min Res 1 Ω	C9	Ceramic 220pF
RV1	Pot Log 10k	C10	Axial 220 μ F 16V
C1,7	Minidisc 0.1 μ F	C11	Polyester 0.22 μ F
X1	Crystal 3.12MHz approx. (FY86T)		
IC1	SP0256		
IC2	TBA820M		
LS1	L/S Lo-Z 668 (WB13P)		
	6V Batt Box (HF29G)		
	PP3 Clip (HF28F)		

Order

QY50E (SP0256) **£7.95**

RADIO FREQUENCY IC's SH120A Wideband RF Amp

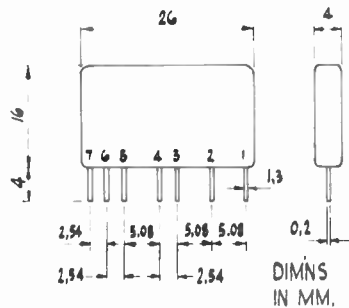
A two stage hybrid wide-band amplifier for aerial preamplifier applications in TV and general purpose in the band 30MHz to 900MHz.

Ratings

Frequency response:	30MHz to 900MHz \pm 1.5dB
Supply voltage:	12V (20V max)
Supply current:	20mA
Gain:	17.5dB
Impedance:	75 Ω
VSWR:	1.5
Noise figure:	5dB

Pin Functions

1	Input
2	Ground
3	Ground
4	Supply voltage
5	Ground
6	Ground
7	Output



Order

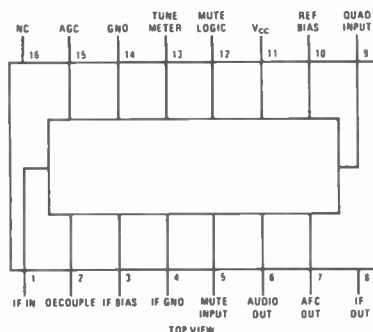
WQ61R (SH120A) **£7.95**

CA3189E FM IF Subsystem

Features

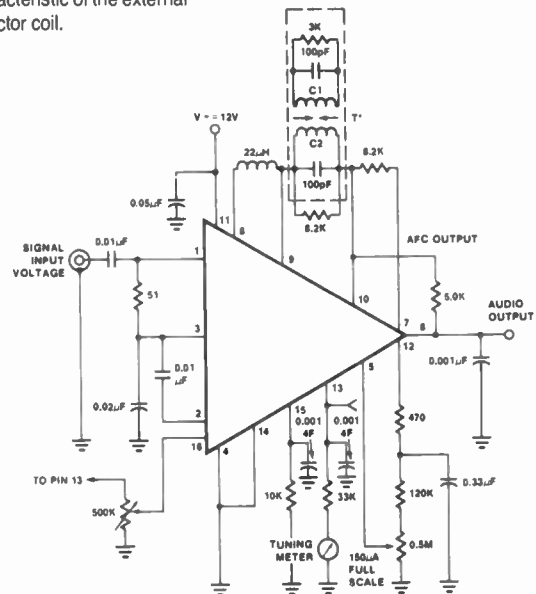
- ★ Exceptional limiting sensitivity: 10 μ V (typical) at -3dB
- ★ Low distortion: 0.1% (with double-tuned coil) typical
- ★ Single-coil tuning capability
- ★ High recovered audio: 500mV (typical)
- ★ Internal supply-voltage regulators
- ★ AGC threshold controlled externally
- ★ Low signal or frequency changed muting option
- ★ Mute — centre channel detect

The CA3189E is a comprehensive FM-IF system designed for high fidelity FM tuners. It includes a three stage FM-IF amplifier/limiter configuration with level detectors for each stage, a double-balanced quadrature FM detector and an audio amplifier that features the optional use of a muting circuit. The advanced circuit design includes desirable special features such as delayed AGC for the RF tuner, an AFC drive circuit, and an output signal to drive a tuning meter and/or provide stereo



switching logic. In addition, internal power supply regulators maintain a nearly constant current drain over the voltage supply range of +8V to +16V. Distortion is primarily a function of the phase linearity characteristic of the external detector coil.

Test Circuit
(Using a double-tuned detector coil)



Notes

All resistor values are typical and in ohms.
 T : Primary - Q_0 (unloaded) = 75 (tunes with 100pF (C1) 20t of 34e on 7/32" dia. form).
 Secondary - Q_0 (unloaded) = 75 (same as primary).
 kQ (% of critical coupling) > 70%.
 Above values permit proper operation of mute (squelch) circuit 'E' type slugs, spacing 4mm.

Absolute maximum ratings

Supply voltage (Pin 11 to 4/14)	18V
DC current out of pin 15	2mA
Max dissipation	600mW

Characteristics (typical at $V_+ = 12V$)

Quiescent current drain:	28mA
DC voltage at pin 1 (IF input):	1.9V
at pin 2 (AC return to input):	1.9V
at pin 3 (DC bias to input):	1.9V
at pin 7 (AFC):	5.6V
at pin 10 (DC reference):	5.6V

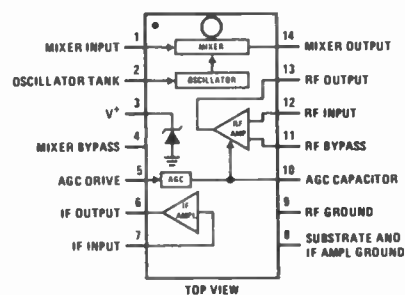
Order

WQ20W (CA3189E) **£2.98**

LM3820 AM Radio Subsystem

An improved replacement of the LM 1820, 3-stage AM radio IC. The chip consists of an RF amp, oscillator, mixer, IF amp, AGC detector and zener regulator.

Supply voltage:	12V (16V max)
Supply current:	18mA
Internal zener voltage:	7.5V
Input sensitivity:	35 μ V for 10mV audio output
Signal to noise ratio:	28dB with 100 μ V RF input
Overload distortion:	6% with 30mV RF input

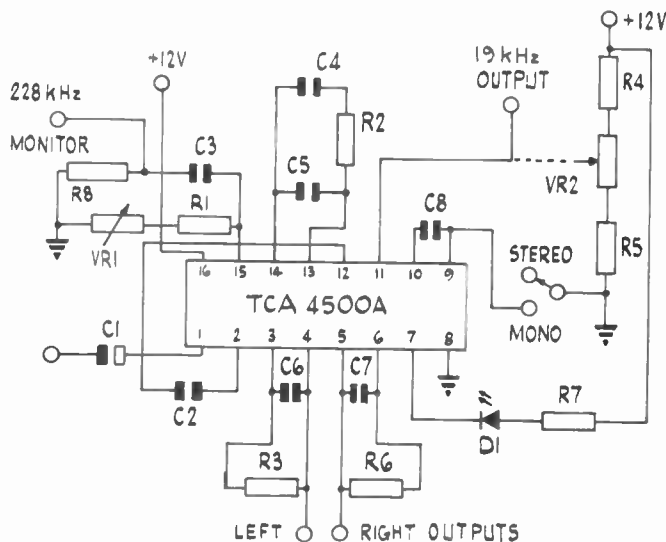


Order

WQ37S (LM3820) **£1.85**

TCA4500A Stereo Decoder

A stereo decoder for FM multiplex broadcasts. Excellent channel separation (better than 60dB at 1kHz possible) with a variable blend control for reduction of multiplex noise under poor signal conditions. Stereo indicator output and distortion typically better than 0.3%. See setting up details for MC1310P for instructions on how to use circuit shown below.



Parts List

R1	Min Res 10k
R2	Min Res 1k
R3	Min Res 5k1
R4	Min Res 4k7
R5	Min Res 270Ω
R6	Min Res 5k1
R7	Min Res 680Ω
R8	Min Res 100Ω
VR1	Hor S-Min Preset 4k7

VR2	Pot Lin 1k
C1	PC Elect 2.2μF 63V
C2	Poly Layer 0.0068μF
C3	Ceramic 220pF
C4	Poly Layer 0.47μF
C5	Poly Layer 0.22μF
C6	Poly Layer 0.01μF
C7	Poly Layer 0.01μF
C8	Poly Layer 0.22μF
D1	LED Red

Order

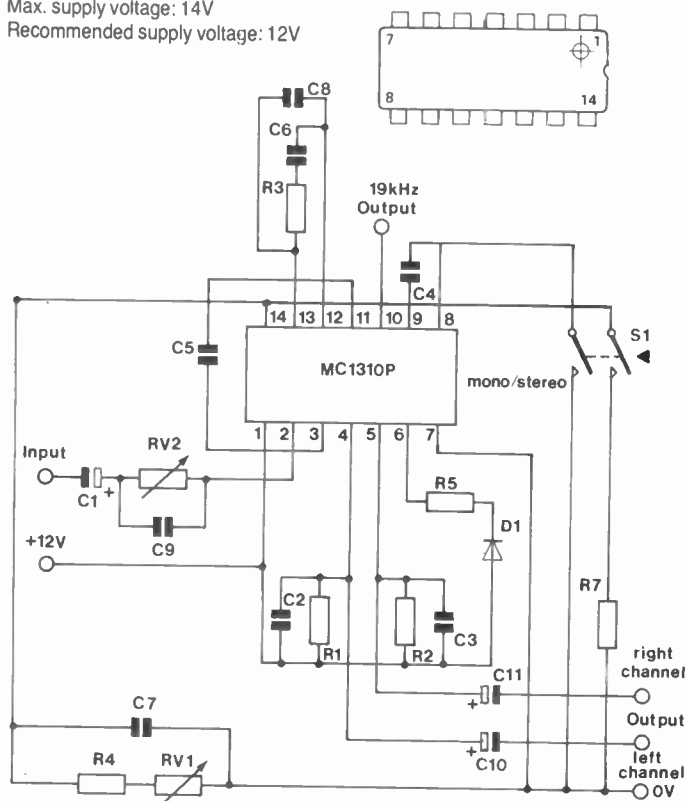
WQ64U (TCA4500A) £3.45

MC1310P STEREO DECODER

A stereo decoder for FM multiplex broadcasts. Stereo indicator output and distortion typically 0.3%. Circuit shows typical application and a printed circuit board is available.

Max. supply voltage: 14V

Recommended supply voltage: 12V



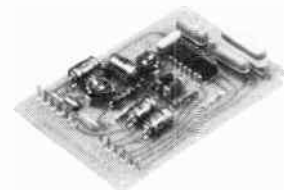
Setting-up

With no input signal applied adjust RV1 until the frequency on pin 10 is 19.00kHz. For those without access to a frequency counter adopt following procedure. Tune the receiver to a stereo broadcast and adjust RV1 until D1 lights. Now rotate RV1 back and forth until the centre of the lamp 'on' range is found. Adjust RV2 for max. stereo separation.

Note: A significantly better aerial will be required for stereo reception than for mono. Even on stereo broadcasts the lamp will not light unless the signal is strong enough to operate the switch in the MC1310P. In general an external roof-top aerial is to be preferred. To connect the finished board to your existing mono tuner, it will be necessary to remove the de-emphasis components in your tuner. These will comprise a capacitor and resistor connected in parallel between the output and earth. If there is an output coupling capacitor the de-emphasis components may be either side of this component. Leave the coupling capacitor in position. Note that these de-emphasis components MUST be removed. The decoder will not function if they are still in circuit.

Component List

R1,2:	Min Res 4k3
R3:	Min Res 1k
R4:	Min Res 16k
R5:	Min Res 470Ω
R7:	Min Res 3k3
RV1:	Sub-Min Horiz Preset 4k7
RV2:	Sub-Min Horiz Preset 2k2
C1:	Axial 2.2μF 63V
C2,3:	Poly Layer 0.012μF
C4:	Polyester 0.22μF
C5:	Polyester 0.047μF
C6:	Polyester 0.47μF
C7:	Mica 470pF



C8:	Polyester 0.22μF
C9:	Polystyrene 4700pF
C10,11	Axial 22μF 25V
D1:	LED Red
S1:	Std Slide Sw
On pcb leave position R6 open circuit.	

Order

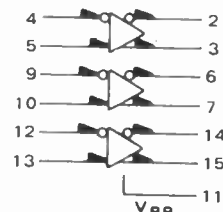
QH45Y (MC1310P)	£1.98
BR03D (Decoder PCB)	£2.20

MC10116P Broadband Amplifier

A 3-stage broadband amplifier capable of handling frequencies up to about 1GHz. The device can be used as a Schmitt trigger since the bias voltage V_{BB} is made available on pin 11. Active current sources provide these amplifiers with excellent common-mode noise rejection. If any amplifier in the package is unused then one input of that amplifier should be connected to pin 11 to prevent upsetting the current source bias network.

Characteristics (typical)

Power supply voltage on pin 8:	-5.2V ($\pm 10\%$)
Voltage pins 1, 16:	0V
Power supply drain current:	<21mA
Input current (high level):	95μA max
(leakage):	1μA max
Reference voltage on pin 11:	-1.29V ($\pm 0.06V$)
Propagation delay:	2.9ns max



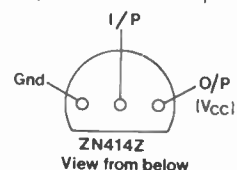
Order

QY23A (MC10116P) £1.45

ZN414 AM Radio

A 10-transistor TRF receiver in a 3-pin TO18 package. The IC contains an RF amplifier, detector and AGC circuit and requires only a few external components to form a complete high quality AM radio.

Excellent audio quality can be achieved and current consumption is extremely low. No setting-up is required and the circuit is completely stable in use.



Characteristics (typical)

Supply voltage:	1.2 to 1.6V (1.3V recommended)
Supply current:	300μA (500μA with strong input signal)
Frequency range:	150kHz to 3MHz
Input resistance:	4MΩ
Threshold sensitivity:	50μV
Audio distortion:	<2% THD
Selectivity:	4kHz bandwidth can be achieved
Power gain:	72dB
AGC range:	20dB
Output:	>30mV rms under correct operating conditions

Layout Requirements

As with any high gain RF device, certain basic layout rules must be adhered to if stable and reliable operation is to be obtained. These are listed below:

1. The output decoupling capacitor must be soldered as close as possible to the

Continued on next page.

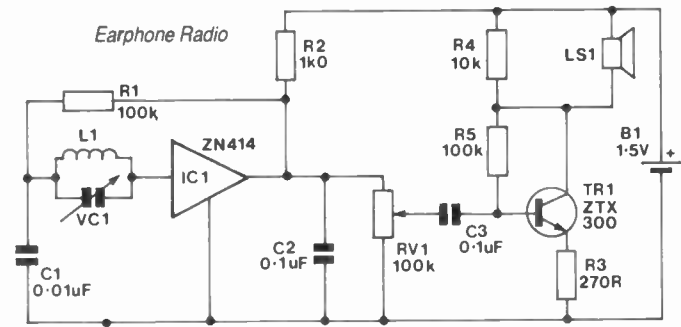
output and ground pins on the IC. Its value and that of R_{AGC} should be calculated from the formula $C(\mu F) = 40/R_{AGC}$.

- All leads should be kept as short as possible, especially those near the IC.
- Keep the tuning assembly some distance from the battery, loudspeaker and their associated leads.
- Connect the 'earthy' side of the tuning capacitor to the junction of the 100k resistor and the 0.01 μF capacitor.

Recommended Circuits

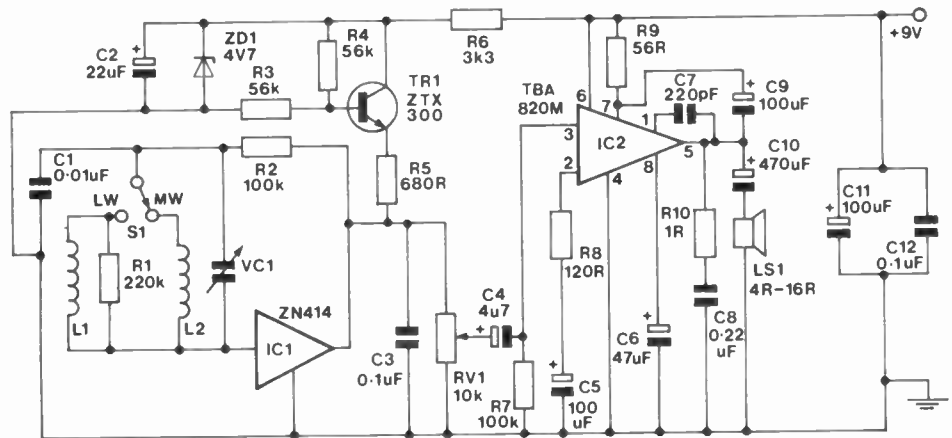
Parts List for Earphone Radio

R1,5	Min Res 100k	VC1	AM Varitune
R2	Min Res 1k	TR1	ZTX300
R3	Min Res 270 Ω	IC1	ZN414
R4	Min Res 10k	LS1	Crystal Earpiece
C1	Minidisc 0.01 μF	B1	1.5V cell e.g. HP7 and holder
C2,3	Minidisc 0.1 μF	L1	Ferrite rod wound with about 80 turns of 30swg enamelled copper wire laid side by side. Minimum length of rod 50mm.
RV1	Pot Lin 100k		



Parts List for Domestic Portable Receiver

R1	Min Res 220k	IC1	ZN414
R2,7	Min Res 100k	IC2	TBA820M
R3,4	Min Res 56k	LS1	L/S Lo-Z 768
R5	Min Res 680 Ω	TR1	ZTX300
R6	Min Res 3k3	L1	Ferrite rod 810 wound with about 55 turns of 30swg enamelled copper wire laid side by side.
R8	Min Res 120 Ω	L2	250 turns of 30swg enamelled copper wire wound bunched up on the same rod as L1.
R9	Min Res 56 Ω		
R10	Min Res 1 Ω		
C1	Minidisc 0.01 μF		
C2	Axial 22 μF 25V		
C3	Minidisc 0.1 μF		
C4	Axial 4.7 μF 63V		
C5,9	Axial 100 μF 10V		
C6	Axial 47 μF 10V		
C7	Ceramic 220pF		
C8	Polyester 0.22 μF		
C10	Axial 470 μF 10V		
C11	Axial 100 μF 25V		
C12	Polyester 0.1 μF		
RV1	Pot Lin 10k		
VC1	AM Varitune		
TR1	ZTX300		
ZD1	BZY88C4V7		

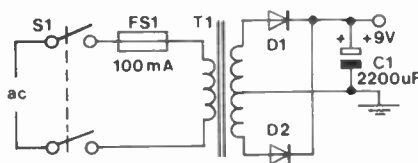


Domestic Portable Receiver

Parts List For Power Supply

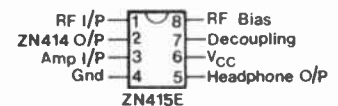
A simple power supply for mains operation of the Domestic Portable Receiver is shown here.

T1	Sub-Min Tr 6V
D1,2	1N4001
C1	Axial 2200 μF 10V
S1	Toggle Sw
FS1	Fuse 20 100mA



ZN415E AM Radio With Amplifier

The ZN415E is a ZN414 and audio amp combined in an 8-pin DIL package. Connect pin 6 to 1.3V approx., and between pin 1 and 8 connect as close as possible the two AM gangs in parallel of our AM/FM Varitune. In parallel with this connect a 5cm ferrite rod aerial with about 80 turns of 30swg enamelled copper wire wound on it. Connect 0.01 μF disc capacitors between pins 8 and 4, and pins 7 and 4. Connect 0.1 μF disc capacitors between pins 2 and 4 and pins 2 and 3. Connect the battery negative to pin 4. This will form a complete AM radio. The output, pin 5, may be connected to the tip of our Personal Stereo Headphones and pin 4 to the ring (leave the sleeve unconnected) to provide the required 64 Ω load.



Characteristics (typical where different from ZN414)

Supply current	2.3mA (3mA with strong signal)
Voltage gain of output stage	6dB
Output	>60mV rms into 64 Ω load

Order

QY61R (ZN415E)	£1.40
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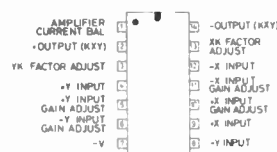
Order

QL41U (ZN414Z)	£1.20
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SG 1495 Multiplier

The SG 1495 four quadrant analogue multiplier is designed for applications where the output voltage required is a linear product of two input voltages. Excellent linearity and operation over a wide supply range and input voltage range. Applications include use as multipliers, dividers, squarers, phase detectors, frequency doublers and as balanced modulators.

- ★Excellent linearity
- ★Adjustable scale factor
- ★Excellent temperature stability
- ★Wide bandwidth
- ★High input voltage range
- ★Wide supply voltage operation

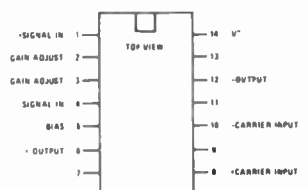


Order

QL06G (SG1495D)	£6.95
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MC1496 Double-Balanced Modulator

The MC1496 is a double-balanced modulator/demodulator. The circuit produces an output voltage which is the product of an input voltage (signal) and a switching function (carrier). Communications applications include modulation and demodulation of AM, SSB, DSB, FSK, FM and phase encoded signals. Signal conditioning techniques possible include frequency doubling and halving, linear mixing and chopping, with additional uses as phase detectors in phase locked loops and as differentiators in NRZ and phase encoded digital tape and disk memories.



Order

QH47B (MC1496)	£1.35
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TDA7000 FM Radio

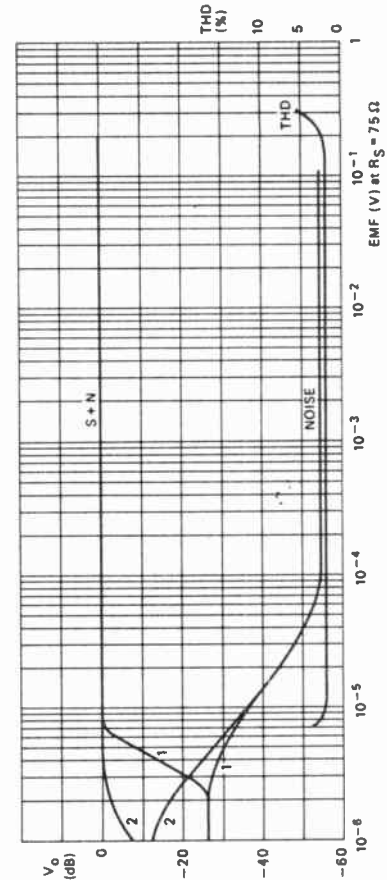
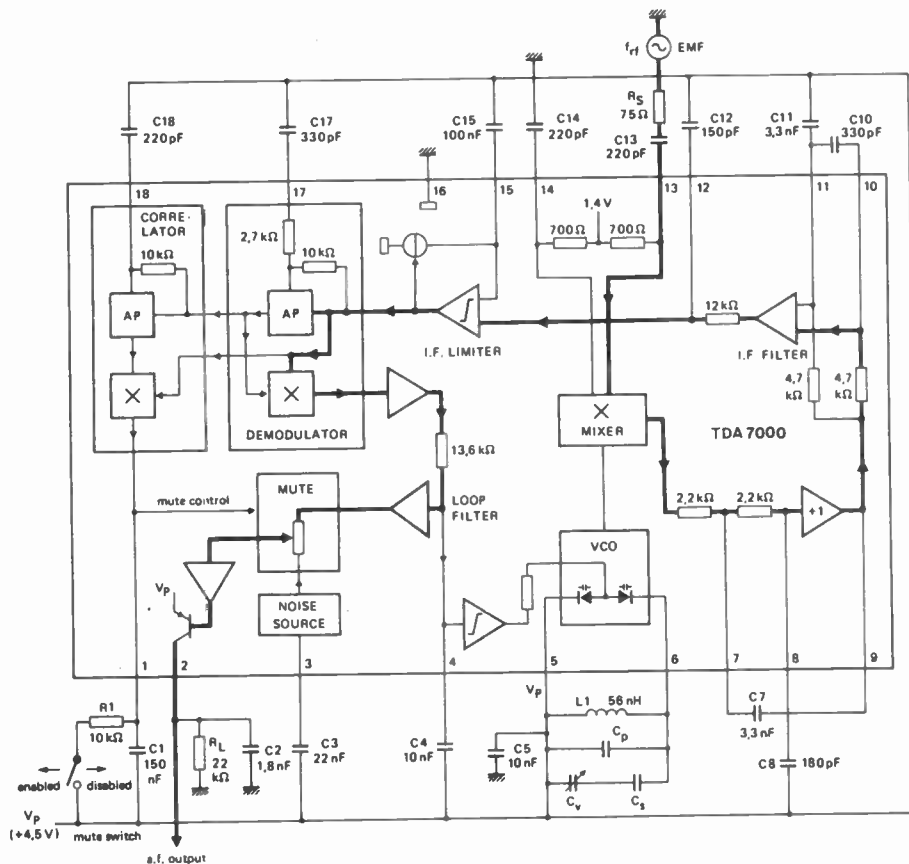
An FM radio on a single chip requiring only a few simple peripheral components. In particular the chip requires only one simple coil and alignment is very easy. The chip includes an RF input stage, mixer, local oscillator, IF amplifier/limiter, phase demodulator, mute detector and mute switch. The output will directly drive a crystal earpiece or could be used with a TBA820M to form a complete portable FM radio.

Characteristics (typical)

Supply voltage:	2.7V to 10V (4.5V typical)
Supply current:	8mA at 4.5V
Frequency range:	1.5MHz to 110MHz (The part of this range attainable on any finished design is determined by the components on pins 5/6)
Sensitivity:	1.5µV (for -3dB limiting, muting disabled) 6µV (for -3dB muting) 5.5µV (for 26dB signal to noise ratio)
Signal handling:	200mV

Signal to noise ratio:	60dB
Total harmonic distortion:	0.7% (± 22.5 kHz modulation) 2.3% (± 75 kHz modulation)
AM suppression:	50dB
Oscillator voltage pin 6:	250mV rms
Variation of oscillator frequency with supply voltage:	60kHz/V
Selectivity:	45dB
AFC range:	± 300 kHz
Audio bandwidth:	10kHz
AF output voltage:	75mV rms
Load resistance at $V_S = 4.5$ V:	≥ 22 k Ω
$V_S = 9$ V:	≥ 47 k Ω

Note that the muting system can be disabled by feeding 20µA into pin 1. The interstation noise level can be decreased by choosing a low-v.a.u capacitor at pin 3. Omit this capacitor to achieve silent tuning.



Graph shows AF output voltage (V_o) and total harmonic distortion (THD) as a function of the emf input voltage (EMF) with a source impedance (R_s) of 75 Ω : (1) muting system enabled; (2) muting system disabled. Conditions: 0dB = 75mV; $f_m = 96$ MHz. For S + N curve: $\Delta f = \pm 22.5$ kHz; $f_m = 1$ kHz. For THD curve: $\Delta f = \pm 75$ kHz; $f_m = 1$ kHz.

Order

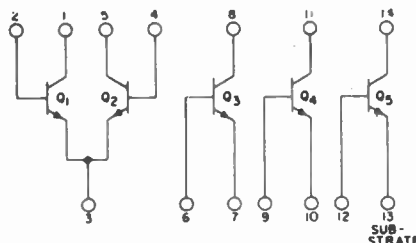
YH87U (TDA7000)..... £2.45

TRANSISTOR ARRAY CA3046

The CA3046 consists of five silicon NPN transistors on a common monolithic substrate in a 14-lead dual-in-line plastic package. Two transistors are internally connected to form a differential amp. The transistors of the CA3046 are well suited to low noise general purposes and to a wide variety of applications in low power systems in the DC through VHF range. They may be used as discrete components in conventional circuits, in addition they provide the very significant inherent integrated circuit advantages of close electrical and thermal matching.

Absolute Maximum Ratings

Each transistor	
V_{CE0} :	15V
V_{CB0} :	20V
C_{C10} :	20V
V_{EBO} :	5V
I_C :	50mA
Total power dissipation:	
@ $T_A = 55^\circ\text{C}$:	300mW
(750mW total package)	



* The collector of each transistor of the CA3046 is isolated from the substrate by an integral diode. The substrate (terminal 13) must be connected to the most negative point in the external circuit to maintain isolation between transistors and to provide

for normal transistor action.

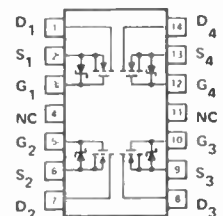
Order

QH26D (CA3046)..... 75p

VMOS POWER FET ARRAY VQ1000

Four completely separate VMOS power FET's in one 14-pin DIL package. The inputs are internally protected from static discharge.

Drain-source voltage (max):	60V
Drain-gate voltage (max):	60V
Continuous drain current (max):	300mA per device
Min. gate threshold voltage:	0.8V
Gate-body leakage (I_{GSS}):	100nA
Gate-source voltage (max):	15V
Forward transconductance:	> 100 ms Ω
Zero gate voltage drain current:	100µA max
Max. input capacitance:	50pF
Total power dissipation:	500mW per FET 1.2W per package



Order

QQ11M (VQ1000CJ)..... £6.95

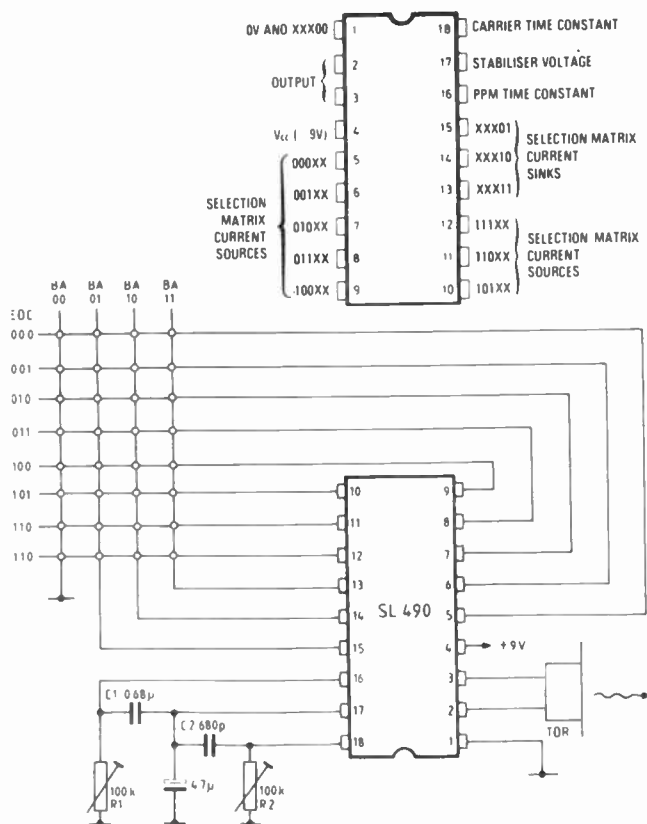
MODEL CONTROL IC's SL490 Transmitter

A 32-channel pulse position modulation transmitter for use with ultrasonic, infra-red, cable or radio links. Applications include remote control of toys and models, radios, tuners, tape and record decks, lamps and lighting, TV's, industrial control etc. The IC is ideally driven from a PP3 9V battery and can generate carrier frequencies of up to 200kHz so that for example an ultrasonic transmitter may be directly driven. Alternatively transmission may be achieved without a carrier for example for infra-red. Each of the 32 channels is initiated by one of 32 simple push-to-make switches directly connected to the IC in a 4 by 8 matrix. Only four or five external components are required to complete the circuit.

Specification (typical)

Supply current (operating)	8mA
Supply current (standby)	6µA
Supply voltage	+7V to +9.5V
Output current	1mA

An application circuit is shown for an ultrasonic transmitter. If an infra-red link is required make C1 a Carbonate 0.22µF remove C2 and R2 and connect pin 18 via a Min Res 2k2 to ground. Connect pin 3 to the input of the infra-red driver circuit shown on page 205 and leave pin 2 unconnected.

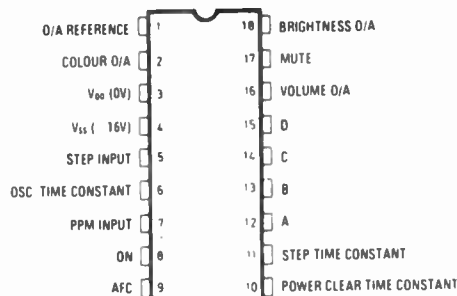


Order

YH66W (SL490) £3.45

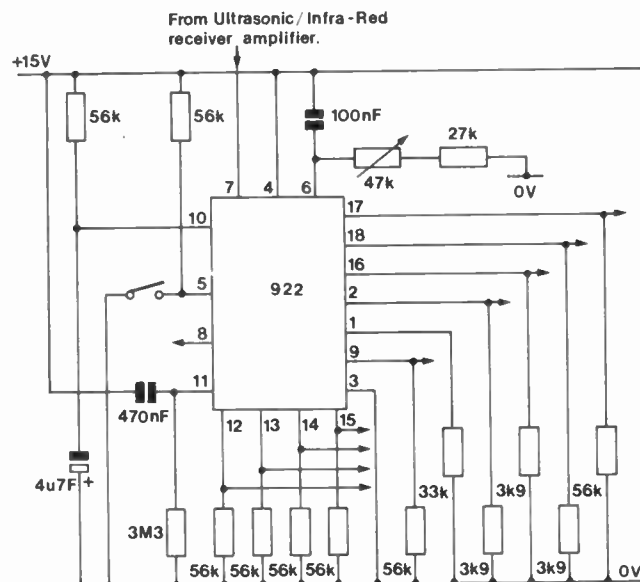
ML922 Receiver

The ML922 demodulates the pulse position modulated signal from the SL490 and then after error checking produces either one of 10 different four-bit codes which may be decoded to give one of 10 different off or on outputs or one of three analogue outputs. In addition there are three digital control outputs. The analogue outputs have 32 steps.



Specification (typical)

Supply current	8mA
Supply voltage	+16V (+14V to +18V) (pin 4)
Analogue o/p current range	0 to 1.3mA approx
Analogue step size	43µA approx (i.e. with 3k9 to pin 3 range is 0V to +5V)



Note that this IC uses negative logic i.e. logic 1 is 0V and logic 0 is +15V. In following table X means that either a 1 or 0 in that position gives output shown.

Transmitter Code	Pin 15 (D)	Receiver Outputs (C)	Pin 13 (B)	Pin 12 (A)
0000X	0	0	0	0
0001X	0	0	0	1
0010X	0	0	1	0
0011X	0	0	1	1
0100X	0	1	0	0
0101X	0	1	0	1
0110X	0	1	1	0
0111X	0	1	1	1
1000X	1	0	0	0
1001X	1	0	0	1
10100		Pin 2 goes more negative		
10101		Steps DCBA to next binary number (connecting pin 5 to 0V has the same effect)		
10110		Pin 16 goes more negative		
10111		Pin 18 goes more negative		
11000		Pin 8 goes negative (also goes -ve while DCBA are changing)		
11001		Pin 17 goes negative then next time goes positive and so on, but will go positive then not change if pin 16 is at zero.		
11010		Not used		
11011		Pins 2, 16 and 18 go to 3/4 max. Pin 17 goes positive		
11100		Pin 2 goes more positive		
11101		Steps DCBA to previous binary number		
11110		Pin 16 goes more positive		
11111		Pin 18 goes more positive		

Pin 9 is normally at +15V and changes to 0V while DCBA is changing.

Order

YH67X (ML922) £5.95

ML926/927 Receivers

As ML928/929 respectively described below, but whilst the ML928/929 has latching output, the ML926/927 has its outputs switched off (low) when no valid code is detected.

Order

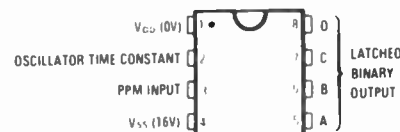
QR57M (ML926) £4.75
QR58N (ML927) £2.45

ML928/929 Receivers

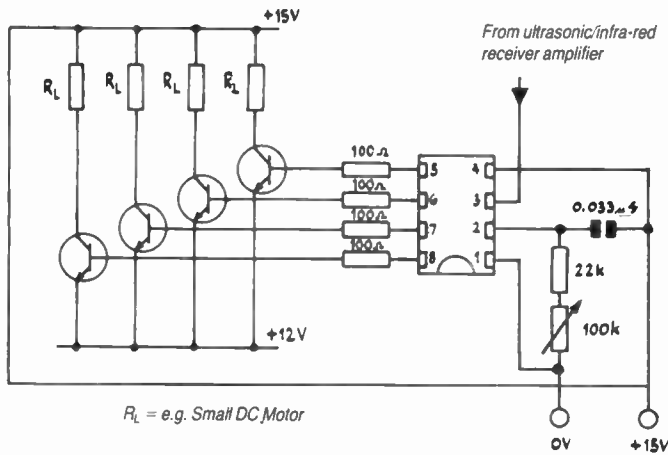
These two chips may be used separately or together to give a different output for each of the 32 codes transmitted by the SL490. The ML928 responds to the first 16 codes and the ML929 to the last 16 as shown in the table below. The four outputs can each source 15mA from open drain drives.

Specification

Supply current	4mA
Supply voltage	+16V
(+14V to +18V) (pin 4)	



Please note that this chip uses negative logic, i.e. logic 1 is 0V and logic 0 is +15V.



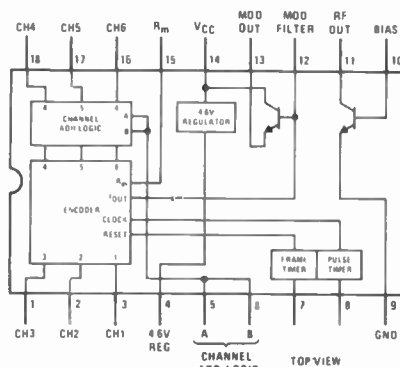
Transmitter Code	ML928	ML929
00000	0000	No change
00001	0001	No change
00010	0010	No change
00011	0011	No change
00100	0100	No change
00101	0101	No change
00110	0110	No change
00111	0111	No change
01000	1000	No change
01001	1001	No change
01010	1010	No change
01011	1011	No change
01100	1100	No change
01101	1101	No change
01110	1110	No change
01111	1111	No change
10000	No change	0000
10001	No change	0001
10010	No change	0010
10100	No change	0100
10101	No change	0101
10110	No change	0110
10111	No change	0111
11000	No change	1000
11001	No change	1001
11010	No change	1010
11011	No change	1011
11100	No change	1100
11101	No change	1101
11110	No change	1110
11111	No change	1111

In the application circuit we have shown each output driving one transistor, however these outputs could of course be used to drive a 4-line to 16-line decoder e.g. 4514BE.

Order		
YH68Y	(ML928)	£5.95
YH69A	(ML929)	£5.95

LM1871 Radio Control Transmitter

A complete six-channel digital proportional encoder and RF transmitter intended for use in low-power radio control in the 27MHz band. The IC develops a field-strength of 10,000µV/metre at 3 metres. When used with the LM1872, a low cost



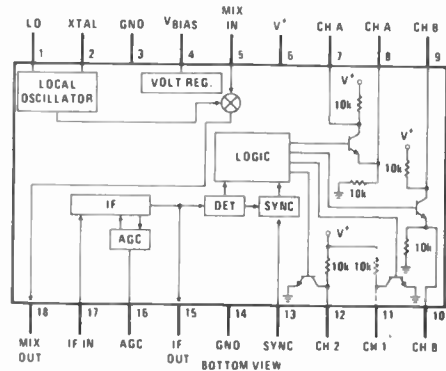
RF linked encoder and decoder system provides two analogue and two on/off decoded channels, so channel add logic is provided in the LM1871 to control the number of encoded channels from three to six.

Specification	
Supply voltage:	4.5V to 15V (9V recommended)
Supply current encoder:	10mA
rf oscillator:	26mA
Reference voltage:	4.6V
RF output level:	400mV rms
F _T transistor (I _C = 10mA, V _{CE} = 5V):	520MHz
h _{FE} transistor (I _C = 10mA):	150 typical
V _{CEO} (I _C = 10µA):	20V typical

Order		
YY71N	(LM1871)	£3.45

LM1872 Radio Control Receiver Decoder

A complete RF receiver decoder for radio control applications. The device is suitable for use in the 27MHz band. The crystal controlled superhet design offers both good sensitivity and selectivity. When used in conjunction with LM1871 it provides four independent outputs, two are analogue pulse width modulated suitable for driving an NE544 servo driver and two are simple on/off digital channels with 100mA drive capability.



Specification	
Supply voltage:	2.5V to 7V (6V recommended)
Supply current	(chan A & B off): 13mA (chan A & B on): 27mA
V _{BIAS} (pin 4):	2.1V
RF sensitivity:	22µV
Bandwidth:	3.2kHz

Order		
YY72P	(LM1872)	£3.45

ZN419CE Precision Servo

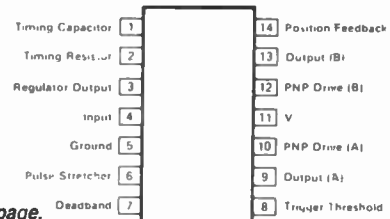
Designed for use in pulse-width position servo mechanisms, its low power consumption and low number of external components make it ideal for use in model aircraft, boats and cars where space, weight and battery life are at a premium. The IC can also be used for motor speed control and has additional circuitry which performs the motor reversing function. Application circuits for a Servo Driver and a Speed Controller are shown in Maplin Project Books 11 and 12.

Specification	
Supply voltage	3.5V min, 6.5V max.
Supply current	6.7mA typical quiescent
Input resistance	27kΩ typical
Input current	500µA typical
Regulator voltage	2.2V typical with 1.3mA load current
PNP drive	55mA typical at 25°C

Order		
YH92A	(ZN419/409CE)	£1.80

NE544 Servo Amplifier

This IC is a servo amp and pulse width demodulator with internal motor drive transistors. It is intended for remote control applications in digital proportional systems, but can be used in many other closed loop applications. It incorporates a

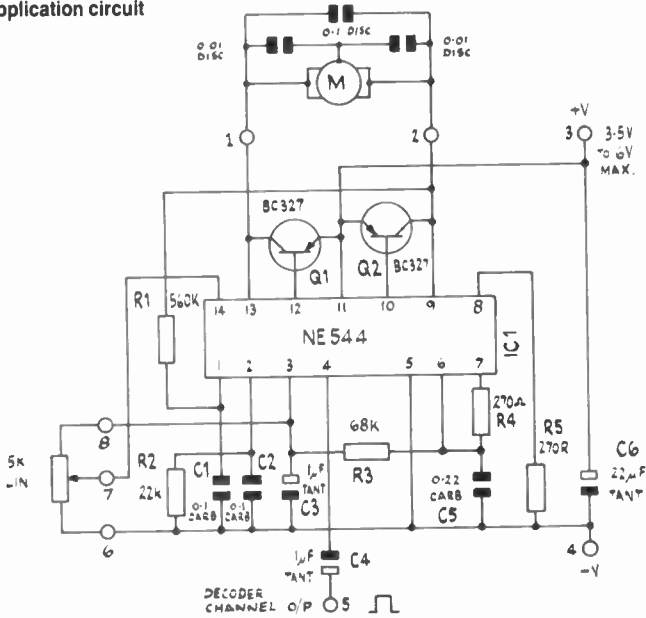


Continued on next page.

NE544 Continued

linear one shot for improved positional accuracy and outputs for external pnp motor drive transistors. Features include 1/2A load current capability with bidirectional bridge output that needs only a single 4.8V (3.2V to 6V max) supply voltage; standby power drain of only 5.5mA; adjustable deadband and trigger thresholds; high linearity: 0.5% error (max); and 20mA drive for two external pnp transistors.

Application circuit



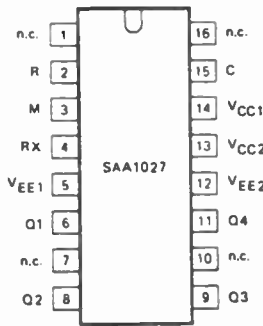
The circuit shown is for driving small motors up to 1A at up to 6V such as our servo & motors in the Wound Components Section of this catalogue. The two BC327 transistors can be omitted for driving motors up to 1/2A at 3 to 6V. A pcb is available.

Order

WQ55K (NE 544) £2.45
 YQ71N (Servo Driver PCB) 98p

SAA1027 Stepper Motor Driver IC

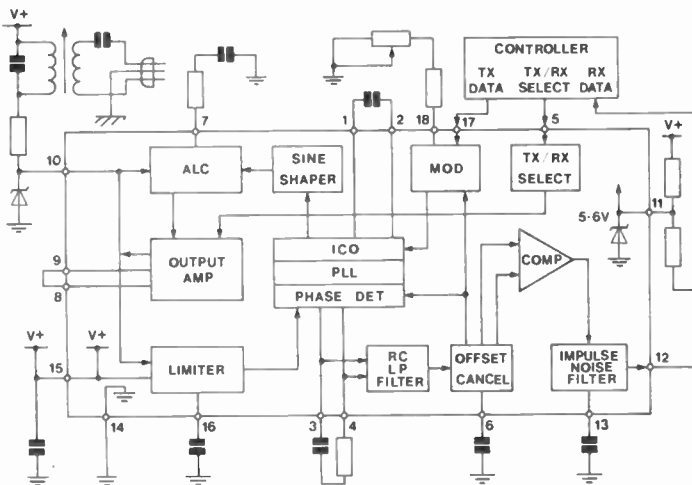
A 16-pin IC designed to drive 4-phase unipolar stepping motors. The IC has a bi-directional 4-state counter, and a code converter so that the four outputs switch in the right order. Supply voltage 9.5V to 18V (typically 4.5mA at 12V). Output current possible is 350mA per output (500mA absolute max. at 25°C). The motor will run clockwise when pin 3 is low (<4.5V), and counter-clockwise when pin 3 is high (>7.5V). The motor will step once for each low to high transition on pin 15. Pin 2 should be connected to pin 13 unless a reset function is required. Taking pin 2 low sets output pins 6 and 9 low, and pins 8 and 11 high. Also see page 437.



Order

QY76H (SAA1027) £3.75

LM1893 Mains Carrier Transceiver



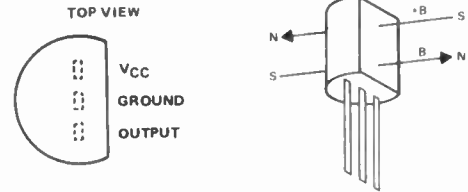
A chip designed to transfer data over the mains between remote locations within one site on the same phase. The chip performs as a power line interface for half duplex (bi-directional) communication of serial bit stream. In transmission mode, a sinusoidal carrier is FSK modulated and impressed on almost any power line via a rugged on-chip driver. In reception mode a PLL-based demodulator and impulse noise filter combine to give maximum range. Data speeds up to 4800 baud are possible with carrier frequencies in the range 50 to 300kHz. A full data sheet is available (price 40p).

Order

UF50E (LM1893N) £14.95

SENSOR IC's TL170C Hall-Effect Switch

A magnetically operated zero-bounce electronic switch using the Hall effect to sense steady-state magnetic fields. The device contains an output transistor with open collector for use on voltages up to 30V. Either of the magnets shown at end of Switches and Relays Section will operate the device when they are within a few millimetres of it. The IC requires a 5V supply (7V max) at 4mA (output high) to 6mA (output low).



Maximum output current: 20mA output low, 20µA output high
 Output voltage (I = 16mA): 0.4V (output low)
 Magnetic flux density needed to operate device: ≥ +25mT
 Magnetic flux density needed to turn device off: ≤ -25mT
 Hysteresis (typical): 20mT
 (Note: 1mT = 1 mWeber/m² = 10 gauss)

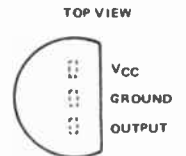
Order

WQ75S (TL170C) £1.10

TL172C Normally Off Hall-Effect Switch

This device is identical to the TL170C with the following exceptions. Only a positive going magnetic field will switch the output to low impedance.

Supply current (when on): 6mA
 Max output current (output low): 100µA (max)
 Magnetic flux density needed to operate device: 45mT (60mT max)
 to turn device off: 22mT (10mT min)
 Hysteresis (typical): 23mT



Order

WQ76H (TL172C) £1.45

634SS2 Linear Output Hall-Effect Device

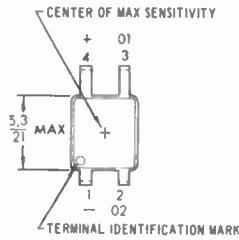
A 4-lead IC whose output voltage varies in response to a change in magnetic flux in a linear fashion. The IC has two outputs, one of which increases in voltage with increasing gauss and one of which decreases in voltage with increasing gauss. The sensitivity is fairly linear over the range -400 to +400 gauss at between 0.75mV to 1.06mV per gauss, but non linear outside this range as shown in the table.

Note that positive gauss represents the South pole of the magnet facing the sensing area and negative gauss represents the North pole of the magnet facing the sensing area.

Terminal Designations

Pin 1: 0V; Pin 2: output 2; Pin 3: output 1; Pin 4, +4V to +10V.

Field Intensity (Gauss)	Output voltage (Volts) at 25°C					
	V _s = 5V		V _s = 7V		V _s = 10V	
	O/P1	O/P2	O/P1	O/P2	O/P1	O/P2
+1000	2.84	1.14	4.4	1.9	6.5	3.15
+800	2.66	1.34	4.15	2.15	6.4	3.25
+600	2.47	1.52	3.9	2.4	6.1	3.6
+400	2.28	1.72	3.6	2.65	5.6	4.0
+200	2.10	1.91	3.25	2.95	5.05	4.5
0	1.92	2.10	2.9	3.3	4.45	5.0
-200	1.74	2.28	2.6	3.6	3.9	5.6
-400	1.55	2.48	2.2	3.9	3.25	6.15
-600	1.35	2.66	1.9	4.2	3.1	6.3
-800	1.15	2.84	1.7	4.4	3.1	6.3
-1000	0.94	3.04	1.65	4.5	3.05	6.35



Characteristics

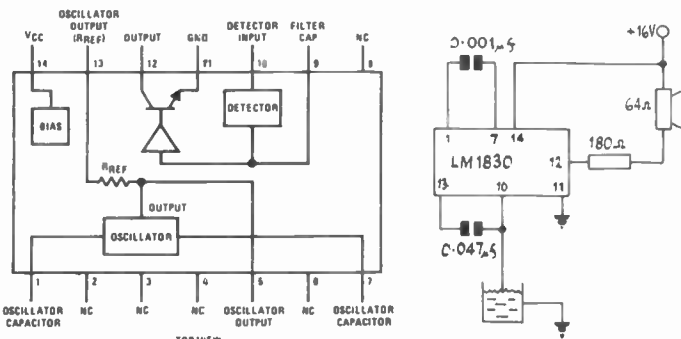
Supply voltage range: 4V to 10V
 Supply current: 3.5mA
 Recommended load: 2k Ω

Order

QR55K (634SS2) £8.50

LM1830 Fluid Level Detector

The IC is ideal for detecting the presence, absence or level of water or other conducting liquids. A detector determines the presence or absence of fluid by comparing the resistance of the fluid with the IC's internal reference resistance. An AC signal is used to prevent plating of the probe. When the probe resistance increases the loudspeaker will emit a 500Hz tone. Alternatively an LED could be connected.



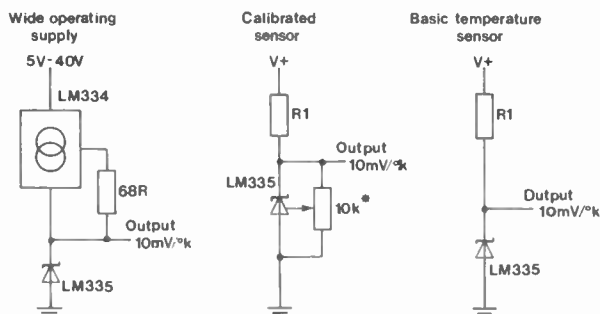
Supply voltage range: +9V to +25V
 Supply current: 5.5mA (at 16V)
 Output sink current: 20mA max
 Internal ref resistor: 13k Ω

Order

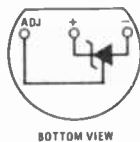
YY99H (LM1830) £2.98

LM335Z Precision Temperature Sensor

An easily calibrated, precision temperature sensor whose operation is similar to a zener diode. The device has a breakdown voltage directly proportional to absolute temperature and has a linear output equal to 10mV/ $^{\circ}$ C. The device operates over a current range of 400 μ A to 5mA (1mA recommended) and even when uncalibrated has a typical temperature error of only 2 $^{\circ}$ C over its operating range. When calibrated the error is 1 $^{\circ}$ C.



* Calibrate for 2.982V at 25 $^{\circ}$ C



Characteristics

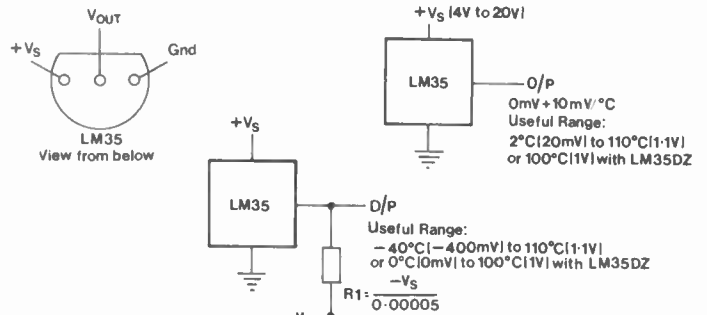
Output voltage at 25 $^{\circ}$ C: 2.98V
 Dynamic impedance: 0.6 Ω
 Time constant in still air: 80 secs
 in 100ft/min air: 10 secs
 in stirred oil: 1 sec
 Operating range: -10 $^{\circ}$ C to 100 C extending to 125 $^{\circ}$ C intermittently.

Order

YY73Q (LM335Z) £1.65

LM35 Precision Centigrade Temperature Sensors

Precision integrated circuits whose output voltage is linearly proportional to the Centigrade temperature. The advantage over the LM335Z is that it is not necessary to subtract a large constant voltage from the output to obtain the Centigrade scale. The chip does not require any external calibration to achieve accuracies of $\pm 10^{\circ}$ C at room temperature and $\pm 90^{\circ}$ C over full temperature range. The device draws only 56 μ A from voltage supplies in the range 4V to 30V so it has very low self-heating <0.1 $^{\circ}$ C in still air. The LM35CZ will operate in the range -40 $^{\circ}$ C to +110 $^{\circ}$ C whilst the LM35DZ operates in the range 0 $^{\circ}$ C to 100 $^{\circ}$ C.



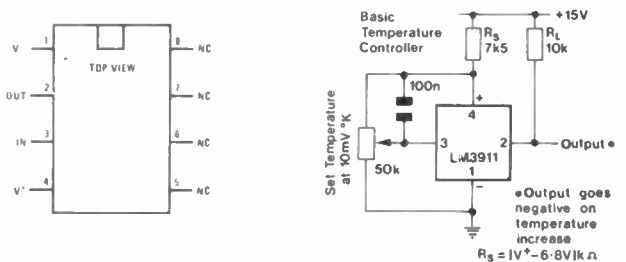
Characteristics (typical)

Accuracy at +25 $^{\circ}$ C: $\pm 0.4^{\circ}$ C (CZ), $\pm 0.6^{\circ}$ C (DZ)
 -40 $^{\circ}$ C to +110 $^{\circ}$ C: $\pm 0.8^{\circ}$ C (CZ)
 0 $^{\circ}$ C to +100 $^{\circ}$ C: $\pm 0.9^{\circ}$ C (DZ)
 Non-linearity: 0.2 $^{\circ}$ C
 Sensor slope: +10mV/ $^{\circ}$ C
 Load regulation: 0.4mV/mA
 Line regulation: 0.01mV/mA
 Quiescent current: 56 μ A at $V_S = 5V$
 56.2 μ A at $V_S = 30V$
 Temperature co-efficient of quiescent current: +0.39 μ A/ $^{\circ}$ C
 Output impedance: 0.1 μ with 1mA load

Order

UF51F (LM35CZ) £4.95
 UF52G (LM35DZ) £2.95

LM3911 Temperature Controller



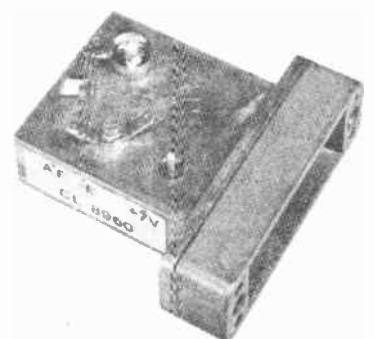
This IC is a highly accurate temperature measurement and/or control system having a temperature sensor, stable voltage reference and an op-amp all on the chip. The output voltage is directly proportional to the temperature at the rate of 10mV/ $^{\circ}$ C. Using the op-amp with external resistors, any temperature scale factor is easily obtained. By connecting the op-amp as a comparator, the output will switch as the temperature transverse the set-point making the device useful as an on/off temperature controller.

Order

WQ40T (LM3911) £1.98

X-Band Doppler Radar Module

A fixed frequency Gunn oscillator and mixer cavity operating in the 10.7GHz band. A return signal 100dB down on radiated power will be achieved from a human target of cross-section 1 square meter at a range of 15m. The output is an audio frequency equal to the Doppler shift between the transmitted and reflected frequencies. It is essential that the earth terminal is used as the common return for the DC supply and the DC bias supplied to the AF terminal. When switched on the



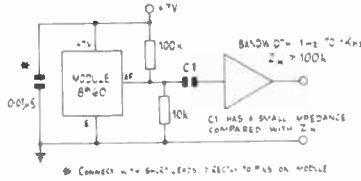
Continued on next page.

Radar Module Continued

device will draw a peak current of 250mA from the supply as the voltage increases through 3V. The final voltage must be carefully stabilised to be within $\pm 0.1V$ of 7V and at that voltage, current drain will be about 140mA. Precautions similar to those required for CMOS should be taken when handling the module.

The module should be mounted using M4 countersunk screws to a 1.6mm (16 swg) thick metal sheet with a 43 x 16mm cut out. Fixing centres are 51mm.

Overall size of front: 61 x 19mm
 Overall depth: 58.3mm
 Overall height: 27mm
 Weight: 170gms



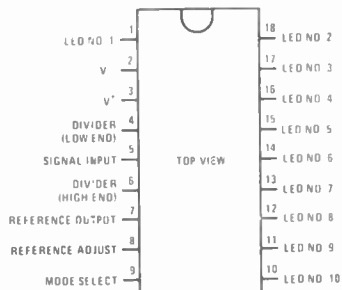
Order

YG37S (CL8960) £39.95

DISPLAY DRIVER IC'S LM3914/5/6 Bargraph Displays

An LED driver that will sequentially light ten LED's when a gradually increasing voltage is applied to pin 5, (dot mode) or in bar mode all LED's indicating voltages below input are lit. In dot mode there is a slight overlap so that at no point are all LED's extinguished. A brightness control will set LED current between 2mA and 30mA. The drivers are stackable

and displays with 100 or more LED's are possible. Supply voltage 3V to 18V. The driver that sets the indication points can be referenced to a wide range of voltages.



Three different chips are available:

- LM3914: linear steps
- LM3915: 3dB steps (logarithmic scale)
- LM3916: VU scale (e.g. -10dB, -7dB, -5dB, -3dB, -1dB, 0dB, 1dB, 2dB, 3dB)

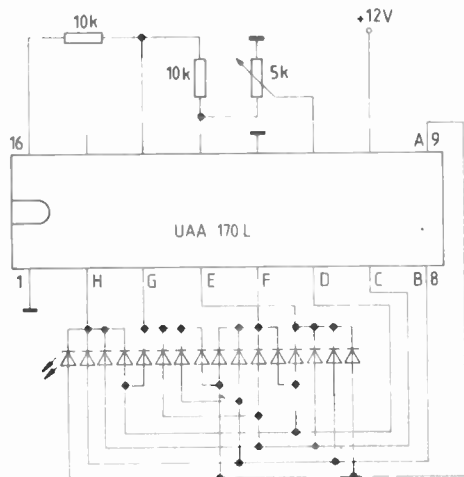
A pcb is available for use with these IC's and information on how to construct and set up this pcb along with circuits and applications can be found in the Maplin Magazine Vol. 4 Issue 14. See inside back cover of this catalogue for details.

Order

WQ41U (LM3914) £3.45
 YY96E (LM3915) £3.95
 YY97F (LM3916) £3.45
 YQ66W (LM3914 PCB) 98p

UAA170L Bargraph Display Driver

An LED bargraph display driver that will drive a bar of 16 LED's giving an approximately logarithmic characteristic. The LED's can be made to change smoothly or abruptly from one to the next. Set the voltage that will light the first LED on pin 12 (ref min) in the range 0V to 4.6V and the voltage to light the last LED on pin 13 (V ref max) in the range 1.4V to 6V. Voltage spans close to 1.4V will cause smooth transitions up the bar whilst increasing this voltage span will cause the transitions to become more abrupt. At around 4V span the light jumps from LED to LED. The controlling voltage (not more than 6V max) is connected to pin 11 via a voltage divider if necessary. The LED current may be set by using pins 14, 15 and 16. Pin 15 should be connected via a resistor to ground. A 1k resistor will give an



LED current range of 0 to 20mA, 4k7 will give 5 to 40mA, open circuit range is 28 to 40mA. The actual current within the range is set by the resistance between pins 14 and 16. A stabilised voltage around 5V is generated internally and appears on pin 14. With 1k on pin 15 a resistance of 10k between pins 14 and 16 will give an LED current of 20mA and 100k will give (virtually) no current. Around 27k will give 4mA — giving a suitable brightness for a dark room. Thus by connecting 10k in series with 18k between pins 14 and 16 and by-passing the 18k resistor with an RPY58A an automatic brightness control will be achieved.

Characteristics

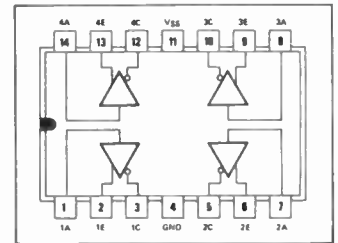
Supply voltage range (pin 10): 11V to 18V (12V recommended)
 Max input voltage (pins 11, 12, 13): 6V
 Current consumption: 4mA (pin 14 current = 0mA)
 Pin 11 input current: -2µA
 Pins 12 and 13 input current: -2µA
 Voltage pin 13: 1.4V to 6V
 Voltage pin 12: 0V to 4.6V
 Stabilised voltage pin 14: 5V typical (I = 300µA)
 4.5V min (I = 5mA)

Order

QY14Q (UAA170L) £4.45

75491 MOS to LED Driver

Four independent drivers designed to interface low current MOS outputs to LED's. Each output has up to 50mA source or sink capability.



Characteristics (typical)

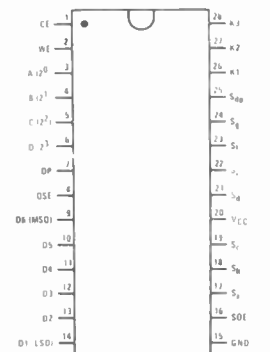
Supply voltage 10V max
 Input voltage range -5V to V_{SS}
 Input current 2.2mA
 Supply current <1mA

Order

UF53H (75491) 74p

74C917 6-Digit Hex Display

A display controller interface element with memory that will directly drive six 8-segment LED displays (i.e. 7-segment and decimal point). The controller receives data information through 5 data inputs (A, B, C, D and DP) and digit information through 3 address inputs (K1, K2, K3). The input data is written into the register selected by the address information when "chip enable" (CE) and "write enable" (WE) are low and is latched when either (CE) or (WE) go high again. A self-contained oscillator sequentially presents the stored data to a decoder where four data bits control the displayed character and one bit controls the decimal point. The oscillator is normally operational and tied low (OSE), but at high level this input prevents the automatic refresh of the display. Segment outputs have up to 100mA capability and digit outputs have up to 20mA capability. Use three of our 2-digit common cathode displays with seven Min Res 68Ω in series with IC pins 17 to 19 and 21 to 25 for direct drive. The drivers are active when output enable (SOE) is low, and high impedance when SOE is high. This feature enables a brightness control to be used.



Normally SOE and OSE are tied to ground. All inputs are TTL compatible and nominal supply voltage is 5V at 0.5mA with output off (SOE high). The registers are addressed like ordinary RAM.

Order

YH30H (74C917) £9.95

ICM7045 Precision Timer/Stopwatch

A precision timer that can operate as a 24-hour clock or stopwatch with four operating modes, and timing to hundredths of a second. A complete stopwatch requires only four of our Dual Common Cathode Displays, a trimmer capacitor, a 6.5536MHz crystal, four switches and three 1.2V nickel cadmium batteries as well as this IC. When connected as a stopwatch, the four operating modes are as follows.

Standard

In this mode the timer starts when start/stop is pressed and stops when re-pressed.

Sequential

In this mode, timing events with more than one leg is possible. The timer starts

when start/stop is pressed and when pressed again, the display is halted and the count resets and starts again immediately. To return display to the count press "display". At the end "reset" halts the counts.

Split Mode

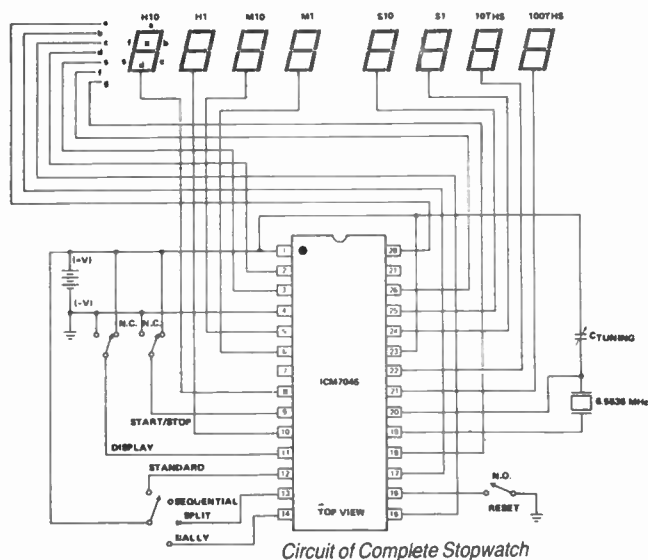
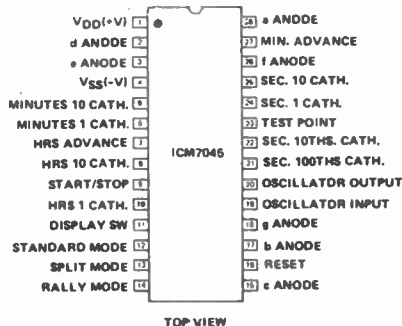
This mode is similar to sequential except that second or later operations of start/stop halt the display, but the count continues instead of being reset.

Rally Mode

In this mode every other start/stop operation halts the display and the count, but does not reset the count. The next operation starts the count again.

Specification

Supply voltage: 3.6V
 Average supply current: 5mA
 Instantaneous segment current: 15mA
 Crystal frequency: 6.5536MHz
 The trimmer can be a 22pF type if it and crystal are kept very close to the IC. A special crystal is available for use with this IC.

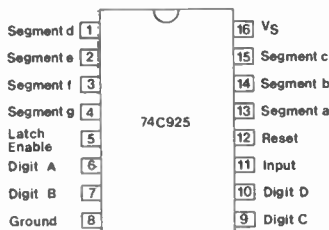


Order

FY90X (Crystal 6.5536MHz)	£2.55
YY93B (ICM7045PI)	£16.95

74C925 4-Digit Counter Driver

A 4-digit counter with 7-segment multiplexed outputs capable of driving a 4-digit common cathode display. The multiplexing circuit has its own free-running oscillator and requires no external clock. The counters advance on the negative edge of the clock applied to pin 11. A high signal on pin 12 will reset the counter to zero. A low signal on pin 5 will latch the number in the counters into the internal output latches.



Characteristics (typical at 25°C)

Supply voltage pin 16: 5V (3V min, 6V max)
 Supply current: 20µA
 Max input frequency: 4MHz
 Multiplex frequency: 1kHz
 Logical '1' input voltage: 3.5V min (15V absolute max.)
 Logical '0' input voltage: 1.5V max
 Logical '1' input current: 5nA
 Logical '0' input current: -5nA

Order

QY08J (74C925)	£7.25
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TMS1121 Universal Timer Controller

A 4-bit single chip microprocessor mask-programmed to operate as a programmable timer controller with the following features:
 Up to 18 times may be set at any one time daily or weekly to operate any one of four different switch outputs.

Memory display of programmed timer sets for switches and day of week.
 Display: day of week, AM/PM switch, clock, ON/OFF/SLEEP status.
 Key entry for clock set and timer set.

Clock Operation

The IC operates as a real-time clock, displaying the time of day, AM or PM and the day of the week. Time of day and the week are entered through the keyboard and displayed on a 4-digit LED display.

Timer Controller

Timer sets can be segregated into two types:

1. Fixed time programs which toggle an output switch at a specific time.
2. Interval programs which toggle an output switch after a specified interval of time has elapsed.

Each timer set will toggle only one switch. The SLEEP function is used to turn a switch ON for one hour then OFF, thus only one timer set is needed to perform two functions. Interval programs are automatically deleted from memory upon execution. Fixed time programs are retained in memory and repeatedly executed. From the keyboard any output switch can be turned on or off without programming the action into memory and timer settings can be changed by either selectively deleting all the timer sets for one day or one switch, or by deleting all timer sets in order to start programming into a cleared memory. Finally, any program in memory can be called to the display in order to verify the programming.

Specification

Supply voltage (V_{DD}): -9V
 Supply current (all outputs open): -5mA
 High level output voltage (O outputs): -0.6V (I_{out} = -6mA)
 (R outputs): -0.4V (I_{out} = -1.2mA)
 Low level output current (V_{OL} = V_{DD}): -100µA max

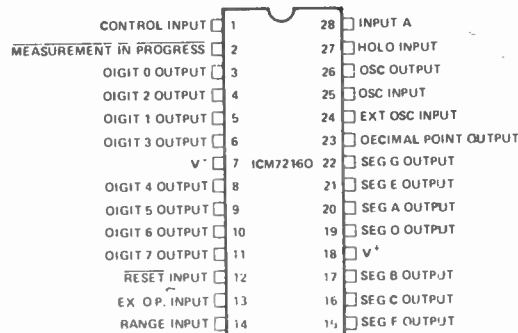
Application circuits, operating details and pcb details are given in Maplin Projects Book 1, see inside back cover of this catalogue for details.

Order

YY88V (TMS1121)	£5.95
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ICM7216D 10MHz Frequency Counter

An 8-digit frequency counter IC operating from DC to 10MHz. Decimal point and leading zero blanking may be externally selected. The IC will directly drive two 4-digit multiplex common cathode displays, and requires only one +5V DC supply and a 1MHz or 10MHz crystal. A circuit using this IC is shown in Maplin Projects Book 4, see inside back cover of this catalogue for details.



Specification

Supply voltage: +5V
 Supply current: 2mA (display off)
 Maximum frequency (pin 28): 10MHz
 Time between measurements: 200ms
 Digit driver output current: 75mA
 Segment driver output current: 15mA
 Input voltage low: 1V max
 high: 3.5V min

Order

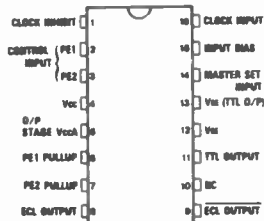
YY94C (ICM7216DPI)	£25.95
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TIMER/COUNTER IC's SP8680B 600MHz Counter Divider

An ECL counter with both ECL 10k and TTL compatible outputs. The IC can operate from ECL or TTL supplies and can divide by 10 or 11. The counter will divide by 10 when either pin 2 or 3 are high and by 11 when both pins are low. A high on pin 14 sets all outputs high and a high on pin 1 holds the current output state. The counter will typically operate up to around 650MHz.

Characteristics

Supply voltage:	5V
Power consumption:	420mW
Max frequency sinewave input:	575MHz
Power supply current	
inc. TTL stage (max):	111mA
TTL output high voltage:	>2.3V
TTL output low voltage:	<0.5V
Input high voltage pins 2 and 3:	>3.9V
Input low voltage pins 2 and 3:	<3.5V

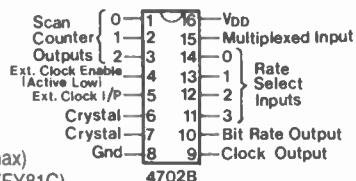


Order

QY18U (SP8680B) £12.95

4702B Programmable Bit-Rate Generator

For use with UART's, this chip will generate 14 of the most commonly used baud rates from one crystal. The rate is selected by applying a 4-bit code to pins 11 to 14. The five most commonly used rates 110, 150, 300, 1200 and 2400 baud can be selected simply by connecting ground to each pin in turn (or no connection for 110 baud). Connect a 2.4576MHz crystal (FY81C) between pins 6 and 7, with a 10MΩ resistor across it and 56pF ceramics from each pin to ground. The output rates available are: 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2400, 4800 and 9600 baud. The data sheet (price 40p) shows how to obtain 19,200 baud. In addition the multiplexed input frequency is available.



Characteristics (typical)

Supply voltage	5V (±10% max)
Crystal	2.4576MHz (FY81C)
Output high current	>-0.5mA
Output low current	>3.2mA

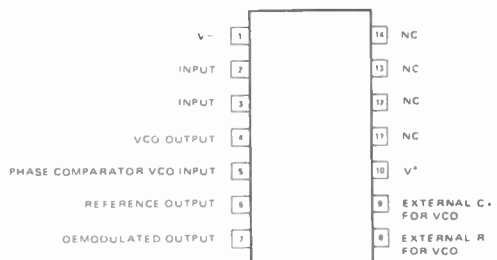
Note that this device is fabricated from CMOS and therefore all normal precautions should be taken.

Order

UF36P (4702B) £8.95

NE565 Phase Locked Loop

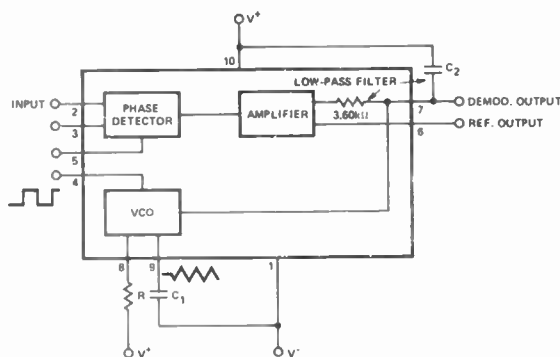
A 14-pin DIL IC containing a voltage controlled oscillator, phase detector and amplifier. The IC is very stable typically 200ppm/°C with high linearity: 0.2% and only 100ppm/% frequency drift with change of supply voltage which can be between ±5V and ±12V. Centre frequency set by resistor between pin 8 and V⁺ and capacitor between pin 9 and V⁻ is $f = 1.2/4RC$ where R is in ohms, C is in Farads and f is in Hz. There is a TTL compatible square wave output, a very linear triangular wave output and a reference output for addition of comparator or frequency discriminator. Bandpass is adjustable from <±1% to >±60% and centre frequency is adjustable over a 10 to 1 range with the same capacitor. Applications include frequency shift keying, modems, tone decoders, wideband FM discriminators, data synchronisers, tracking filters, signal restoration and frequency multiplication and division.



The lock range will be $\pm 8f_o V_{CC}$ Hz where V_{CC} is the total supply voltage (i.e. if V⁺ is +6, V⁻ is -6 then $V_{CC} = 12V$).

$$\text{Capture range} = \pm \frac{1}{2\pi} \sqrt{\frac{2\pi f_o}{\tau}}$$

where f_o is the lock range and $\tau = 3600C_2$ where C_2 is the capacitor between pin 7 and V⁻ in Farads.



The frequency range is 0.001Hz to 500kHz.

Order

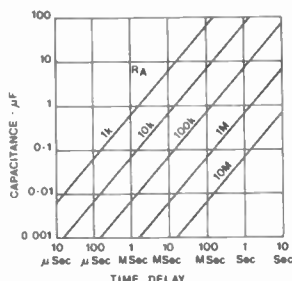
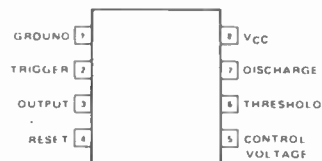
WQ56L (NE 565) £1.32

NE555V Timer

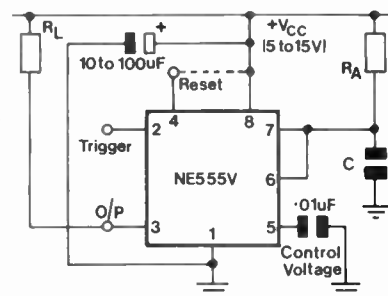
The NE555V is a highly stable device for generating accurate time delays or oscillation. Additional terminals are provided for triggering or resetting if desired. In the time delay (monostable) mode of operation the time is precisely controlled by one external resistor and one capacitor. For stable operation as an oscillator, the free running frequency and the duty cycle are both accurately controlled with two external resistors and one capacitor. The circuit may be triggered and reset on falling waveforms and the output structure can source or sink up to 200mA or drive TTL directly.

This IC may also be correctly supplied marked as MC1455PI. Supply decoupling must be provided close to the IC to counter the 'crowbar' effect of the device's internal discharge switch, a suitable value is 10 to 100μF as shown in the accompanying diagrams.

Monostable Mode

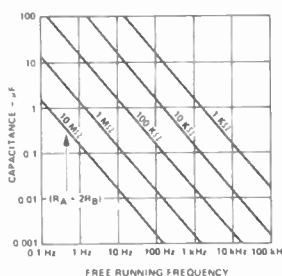


Time Delay vs R_A and C

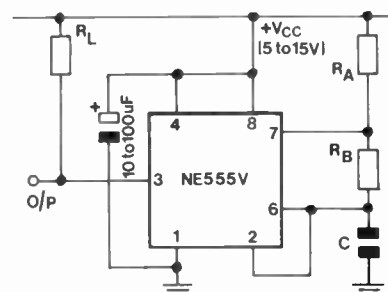


On time after triggering (i.e. applying a voltage to pin 2 less than 1/3 supply voltage) is equal to $1.1R_A C$. The load may be connected to V_{CC} for normally-on operation or between V_{CC} and ground for normally-off. Connecting reset to ground during on time, drives the output low until a new trigger pulse occurs. Additional trigger pulses during on time have no effect. If reset is not being used, connect it to V_{CC} .

Astable Mode (Oscillator)



Free Running Frequency vs R_A , R_B and C



The frequency bipolar is equal to $1.44/[(R_A + 2R_B)C]$. The charge time (output high) is given by $t_1 = 0.693(R_A + R_B)C$ and the discharge time (output low) is given by $t_2 = 0.693(R_B)C$.

Characteristics (typical)

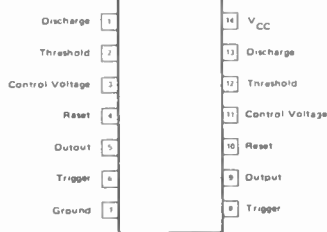
Supply voltage:	4.5V (min), 16V (max)
Supply current:	3mA ($V_{CC} = 5V$), 10mA ($V_{CC} = 15V$)
Threshold voltage:	$V_{CC} \times 0.667$
Trigger voltage:	5V ($V_{CC} = 15V$), 1.67V ($V_{CC} = 5V$)
Trigger current:	0.5µA
Threshold current:	0.1µA
Control voltage level:	10V ($V_{CC} = 15V$), 3.33V ($V_{CC} = 5V$)

Order

QH66W (NE 555) 28p

NE 556 Dual Timer

The NE556 is a single 14-pin DIL package containing two NE555 timers.



Order

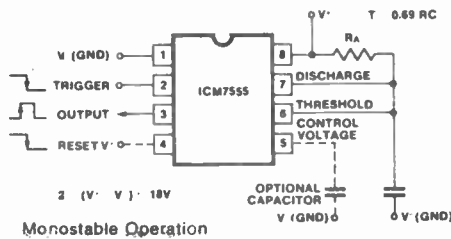
QH67X (NE 556) 51p

ICM7555 Low Power Timer

A low power timer designated ICM7555 is a direct pin-for-pin replacement for the NE555V bipolar timer, but requires only around a hundredth of the supply current required by the NE555V. The CMOS device has extremely low trigger threshold and reset currents — typically 20pA; a very wide supply voltage range from 2V to 18V and the reset does not crowbar the supply during output transitions. The device can operate from microseconds up to about a day. The output can drive at least two standard TTL and CMOS and all inputs and outputs are fully protected against static discharge and no special handling is required at all. Supply decoupling is normally not required close to the IC unlike the NE555V, nor is the control voltage decoupling capacitor usually required as it is with the NE555V, thus there is a saving in external components. To keep the total power supply requirements low, choose high values for R_A and R_B and low values for C which should be a low leakage type and not ceramic.

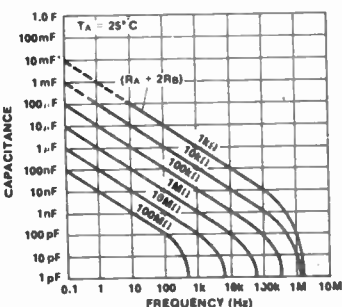
Specification

Supply voltage:	Minimum 2V, maximum 18V
Supply current:	80µA typical
Threshold current:	10pA at $V^+ = 5V$, 50pA at $V^+ = 18V$
Max frequency in astable mode:	At least 500kHz
Trigger current:	10pA at $V^+ = 5V$, 50pA at $V^+ = 18V$
Reset current:	20pA at $V^+ = 5V$, 100pA at $V^+ = 18V$
Reset voltage:	+0.7V
Temperature stability:	50ppm/°C at 25°C
Output sink current:	100mA max at $V^+ = 18V$

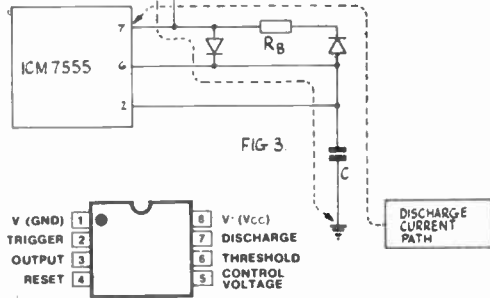
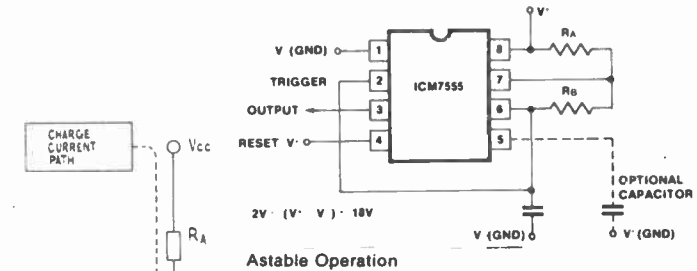
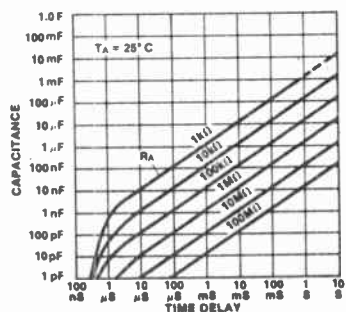


Monostable Operation

FREE RUNNING FREQUENCY AS A FUNCTION OF R_A , R_B AND C



TIME DELAY IN THE MONOSTABLE MODE AS A FUNCTION OF R_A AND C



In astable mode the frequency of operation is given by:

$$f = 1.46/[(R_A + 2R_B)C] \text{ Hz}$$

Fig. 3 shows how to achieve duty cycles of 50% and less. In a monostable mode the period time is given by:

$$t = 0.69RC \text{ sec.}$$

(In both equations R is in ohms and C is in Farads.)

Order

YH63T (ICM 7555) 98p

TLC 555C Low Power Timer

NEW

A low-power pin-for-pin replacement for the NE555V, but requiring only about one fiftieth of the supply current. The device has extremely low trigger, threshold and reset current, typically 20pA, and a very wide supply voltage range 2V to 18V. Supply decoupling close to the device is not required. The outputs are fully CMOS, TTL and MOS compatible. Choose high values for timing resistors to keep supply currents low and low values for capacitance which should be low leakage types, not ceramic.

Specification

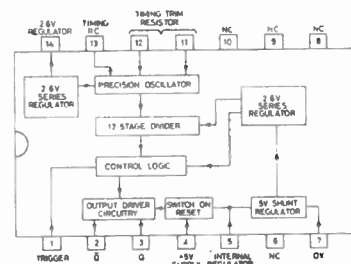
Supply voltage:	2V to 18V
Supply current:	170µA at 5V, 360µA at 15V
Threshold current ($V_{DD} = 5V$):	10pA
Trigger current ($V_{DD} = 5V$):	10pA
Reset current ($V_{DD} = 5V$):	±10pA
Reset voltage level:	0.7V
Output sink current:	100mA max
Output source current:	10mA max
Max frequency in astable mode:	2.1MHz

Order

RA76H (TLC555CP) 65p

ZN1034E Precision Counter Timer

A precision timer which with the addition of suitable resistors and capacitors can generate time periods from 16ms to several days. For periods of 2 seconds and greater, the timing components R_T and C_T can be determined from the equation $T = C_T \cdot R_T$, where $R_T > 12k\Omega$ and $C_T > 33nF$ and $K = 2800$. R_T is connected between pins 13 and 14 and C_T between pins 13 and 7. A trim pot may be connected between pins 11 and 12 (typical values 50k to 500k) to provide a fine adjustment though this will affect the timing constant e.g. for $R_{TRIM} = 50k$, K becomes 3700. Full details are given in the data sheet (price 40p).



Continued on next page.

ZN1034E Continued

Characteristics (typical)

Timing resistor	3k3 to 5MΩ
Timing capacitor	>1nF
Trim range	±50% (R _{TRIM} = 0 to 500k)
	±25% (R _{TRIM} = 0 to 100k)
	±12% (R _{TRIM} = 0 to 50k)
Supply voltage	5V
Supply current	3.5mA
Reference voltage	2.6V
Output voltage high	3.6V at 25mA (max current)
Output voltage low	0.2V at -25mA (max current)

Order

UF32K (ZN1034E) £2.30

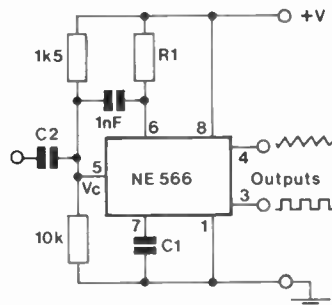
NE566 Function Generator

Features

- ★ Wide range of operating voltage (10 to 24V or ±5V to ±12V)
- ★ Very high linearity of modulation
- ★ Extremely stable frequency (200ppm/°C typical)
- ★ Highly linear triangle wave output
- ★ High accuracy square wave output
- ★ Frequency determined by resistor, capacitor, voltage or current
- ★ Frequency adjustable over 10 to 1 range with same capacitor

Applications

- ★ Tone generators
- ★ Frequency shift keying
- ★ FM modulators
- ★ Clock generators
- ★ Signal generators
- ★ Function generators



The control voltage V_C must be between $\frac{3}{4}V^+$ and V^+ . The modulating signal should be applied to pin 5 via a suitable capacitor C_2 or directly if the bias voltage remains within the limits. The frequency is given by:

$$f = \frac{2[(V^+) - (V_C)]}{R_1 \cdot C_1 \cdot V^+}$$

and R_1 should be in the range 2k to 20k.

Order

QH68Y (NE566) £1.60

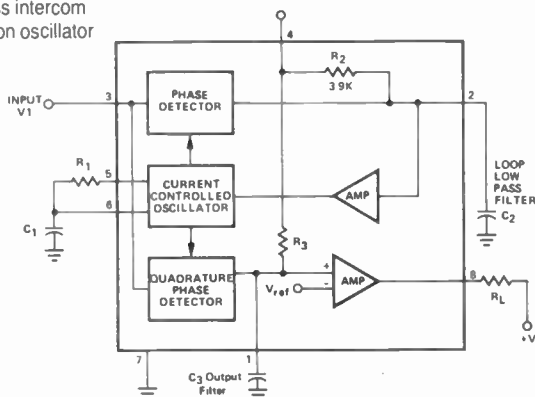
NE567 Tone Decoder/Phase Locked Loop

Features

- ★ Wide frequency range (0.01Hz to 500kHz)
- ★ High stability of centre frequency
- ★ Independently controllable bandwidth (0 to 14%)
- ★ High out-band signal and noise rejection
- ★ Logic compatible output with 100mA current sinking capability
- ★ Inherent immunity to false signals
- ★ Frequency adjustment over a 20 to 1 range with an external resistor

Applications

- ★ Carrier current remote controls
- ★ Ultrasonic controls (remote TV etc.)
- ★ Communications paging
- ★ Frequency monitoring and control
- ★ Wireless intercom
- ★ Precision oscillator



Characteristics

Max operating voltage:	10V
Positive voltage at input:	0.5V above supply
Negative voltage at input:	-10V DC
Output voltage:	15V DC
Operating voltage range:	7mA (12mA activated)

Design Formulae

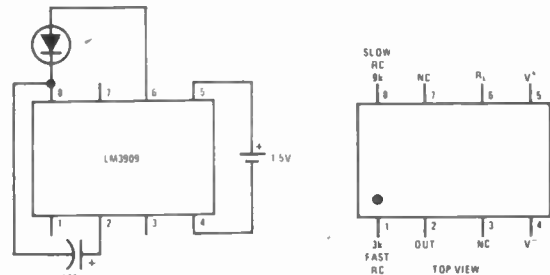
$f_o = 1.1/R_1 \cdot C_1$ where R_1 is between 2kΩ and 20kΩ and f_o is the centre frequency. Bandwidth = $1070 \sqrt{V_i/f_o \cdot C_2}$ where V_i is the input rms voltage. $C_3 = 2(C_2)$.

Order

QH69A (NE567) £1.75

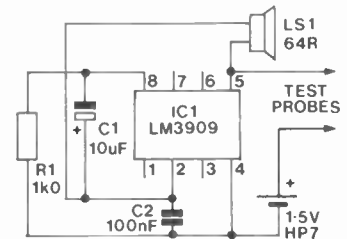
LM3909 LED Flasher/Oscillator

With the addition of a 1.5V battery and capacitor this IC will deliver pulses of over 2V to an LED to flash it brightly, with a current drain of less than 0.5mA. It has a powerful output and can directly drive an 8Ω speaker. Applications include flasher to locate torch or boat mooring floats at night, sales and advertising gimmicks, emergency locators e.g. for fire extinguishers, toys and novelties, trigger and sawtooth generators, siren for toy cars etc., warning indicators for 1.4V to 200V.



Continuity Tester Parts List

R1	Min Res 1k
C1	Minelect 10µF 16V
C2	Minidisc 0.1µF
IC1	LM3909
LS1	Hi-Z L S 64Ω
1	HP7 Battery Holder (YR59P)
1 pair	Test Probes



In this circuit there is an audible difference between short circuits, coils and resistances of a few ohms etc.

Order

WQ39N (LM3909) £1.09

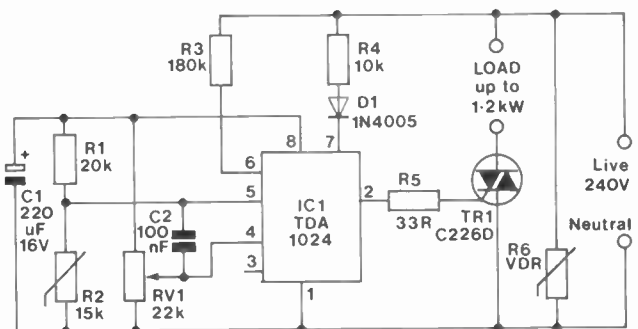
POWER CONTROL & VOLTAGE REFERENCE IC's

TDA1024 Zero Voltage Switch

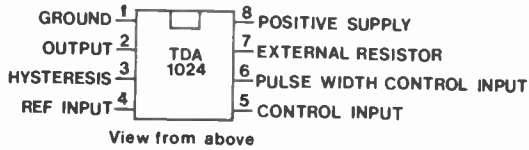
The IC generates positive going pulses to trigger a triac or thyristor. The trigger pulses coincide with the zero crossings of the mains voltage to minimise r.f. interference and transients on the mains supply.

Characteristics (typical)

Supply voltage (pin 8):	6.5V
Supply current (pin 7):	10mA
Input current (pins 4,5):	<5µA
Pulse width (pin 6):	195µs
Output voltage at $-I_{OH} = 100mA$:	>4V
Output voltage at $-I_{OH} = 1mA$:	>1V



Thermostat covering the range 5°C to 30°C



Parts List

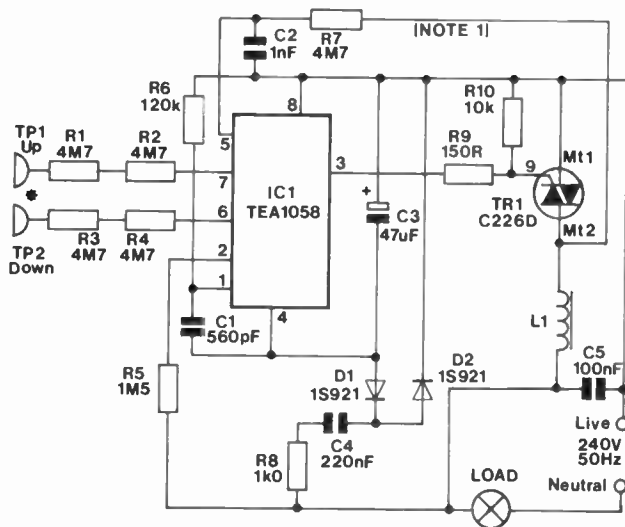
R1	Min Res 20k	C1	Axial 220µF 16V
R2	Thermistor VA1056S (FX22Y)	C2	Minidisc 0.1µF
R3	Min Res 180k	RV1	Pot Lin 22k
R4	W/W Min 10k	D1	1N4005
R5	Min Res 33Ω	TR1	C226D
R6	Mains Trans Supp (HW13P)	IC1	TDA1024

Order

YY76H (TDA1024) £1.26

TEA1058 Touch-Controlled Lamp Dimmer

A bipolar IC for switching and regulating lamps and other loads with the minimum of external components that will directly drive a triac. A brief touch of either or both touch pads, will cause the lamp to be switched alternately on and off. When off, a long touch of either or both touch pads will cause the lamp to switch on at the brightness previously set. When on, a long touch of the Up touch pad will cause a gradual increase to maximum brightness. Similarly, the DOWN touch pad causes a gradual decrease to minimum brightness. If both contacts are touched together for a long period when the lamp is on, there is no action. The IC may be used for resistive or reactive loads and can be used not only for lamps, but also for fans, power tools etc. In the circuit shown, loads up to 500W may be connected.



*Important Note. Under no circumstances substitute R1, R2 or R3, R4 for a single 10M resistor.

Note 1. The connection to pin 5 must be kept as short as possible, and C2 should be connected as close as possible to pins 5 and 8.

Parts List

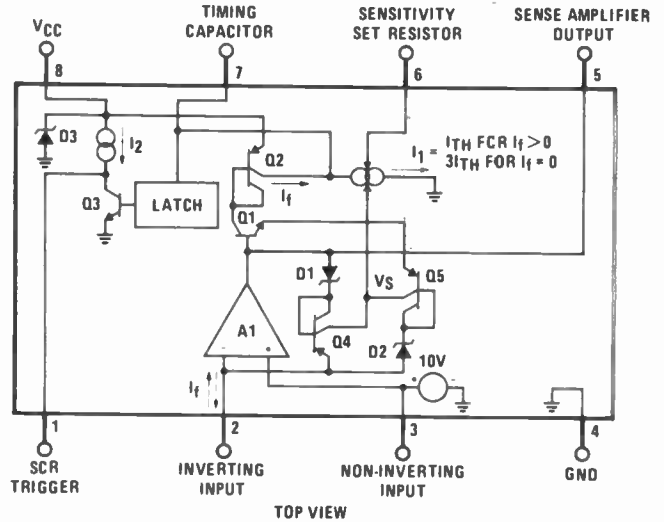
R1,2,3,4,7:	1W Res 4M7	Oscillator	1	8	+V Supply
R5	1W Res 1M5	Slave input	2	7	Up Input
R6	Min Res 120k	Output	3	6	Down Input
R8	1W Res 1k	Common	4	5	Synchronisation
R9	Min Res 150R				
R10	Min Res 10k				
C1	Polystyrene 560pF				
C2	Ceramic 1000pF				
C3	Axial 47µF 25V				
C4	IS Cap 0.22µF				
C5	IS Cap 0.1µF				
L1	RF Supp Choke 3A (HW06G)				
D1,2	1S921				
TR1	C226D				
IC1	TEA1058				
TP1,2	Touch Pads Triangular (HY01B)				
1	Blanking Plate (HL86T)				

Order

YH91Y (TEA1058) £3.95

LM1851 Ground Fault Interrupter

The LM1851 is designed to provide ground fault protection for AC power outlets. Ground fault currents greater than a pre-settable threshold value will trigger an external SCR driven circuit breaker to break the AC line. In addition to detecting live to ground faults, neutral faults can also be detected. Special features include circuitry to rapidly reset the timing capacitor in the event that noise pulses introduce unwanted charging currents and a memory circuit that allows firing of even a sluggish breaker on either half-cycle of the line voltage when external full-wave rectification is used.



Characteristics (typical at 25°C)

Supply current:	19mA
Power supply shunt regulator voltage (pin 8):	26V (22V to 30V)
Latch trigger voltage (pin 7):	17.5V (15V to 20V)
Sensitivity set voltage (pin 8 to 6):	7V (6V to 8.2V)
Output drive current (pin 1 with fault):	1mA (0.5 to 2.4mA)
Output saturation voltage (pin 1 no fault):	100mV (240mV max)
Output saturation resistance (pin 1 no fault):	100Ω
Output external current sinking capability:	5mA
Normal fault current sensitivity:	5mA
Trip time:	18ms

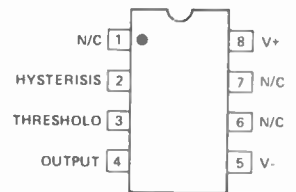
Order

QY36P (LM1851N) £2.45

8211 Voltage Detector

A highly accurate micropower integrated circuit intended primarily for precise voltage detection and generation. The IC provides a 7mA current limited output sink when the voltage applied to 'Threshold' is less than 1.15V — the internal reference. A low current output 'Hysteresis' is also turned on at this point and may be used to provide positive and noise free output switching using a simple feedback network.

Applications include low battery indicators, power supply malfunction detectors for volatile memory systems etc. Supply voltage 2V to 30V at 22µA supply current.

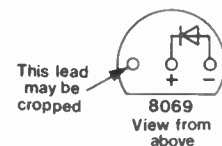


Order

YH43W (8211 CPA) £2.95

8069 Voltage Reference

A 1.2V temperature compensated voltage reference with excellent stability and reverse currents down to 50µA. For use with A/D, D/A converters, threshold detectors etc. Stability of V_R with change in I_R from 50µA to 5mA is excellent, the change in V_R being <20mV. Reverse dynamic impedance is typically 1Ω. Temperature coefficient: 0.005%/°C.



Order

YH39N (8069CCZR) £1.95

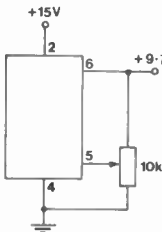
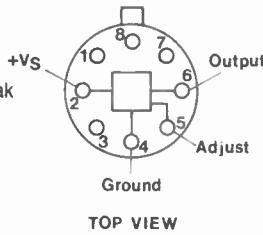
+ 10V Precision Reference

NEW

A precision bandgap voltage reference giving 10V ± 1%. The device has short circuit protection, an adjust pin for up to ± 3% adjustment and excellent stability with large changes in temperature, load current and input voltage.

Specification (typical at 25°C)

Output voltage:	10V ± 0.1V
Adjustment range:	± 3.3%
Supply voltage:	12V to 30V
Output voltage noise:	25µV peak-to-peak
Line regulation:	0.009%/V
Load regulation:	0.006%/mA
Supply current:	1mA
Load current:	21mA
Sink current:	-0.5mA
Short circuit current:	30mA
Temperature coefficient:	20ppm/°C



Output adjustment

Order

RA82D (REF-01CT) £4.95

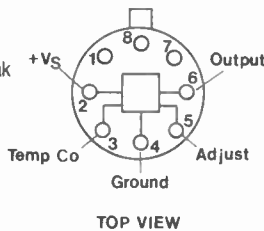
+ 5 Precision Reference

NEW

A precision bandgap reference giving 5V ± 1%. The device has short circuit protection, an adjust pin for up to ± 6% adjustment and excellent stability with large changes in temperature, load current and input voltage. The circuits shown for the 10V Ref can be used with this device. In addition, this device has an output on pin 3 whose voltage changes linearly with temperature, from 577.5mV at 0°C to 724.5mV at 70°C. The current on this pin must not exceed 50nA and capacitance must be less than 30pF.

Specification (typical at 25°C)

Output voltage:	5V ± 0.05V
Adjustment range:	± 6%
Supply voltage:	7V to 30V
Output voltage noise:	12µV peak-to-peak
Line regulation:	0.009%/V
Load regulation:	0.006%/mA
Supply current:	1mA
Load current:	21mA
Sink current:	-0.5mA
Short circuit current:	30mA
Temperature coefficient:	20ppm/°C
Tempco voltage output:	630mV at 25°C ± 2.1mV/°C



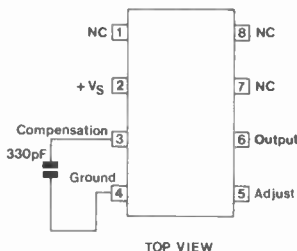
Order

RA83E (REF-02CT) £4.50

+ 2.5V Precision Reference

NEW

A precision bandgap reference giving 2.5V ± 1%. The device has short circuit protection, an adjust pin for up to ± 6% adjustment and excellent stability with large changes in temperature, load current and input voltage. The circuits shown for the 10V Ref can be used with this device except that in addition a 330pF capacitor must be connected between pins 3 and 4.



Specification (typical at 25°C)

Output voltage:	2.5V ± 0.025V
Adjustment range:	± 6%
Supply voltage:	4.5V to 30V
Output voltage noise:	5µV peak-to-peak
Line regulation:	0.001%/V

360

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

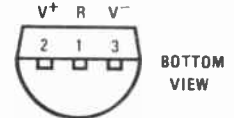
Load regulation:	0.01%/mA
Supply current:	1mA
Load current:	20mA
Sink current:	-0.5mA
Short circuit current:	30mA
Temperature coefficient:	0.7ppm/°C

Order

RA84F (REF-03CNB) £2.45

LM334Z Adjustable Current Source

This IC in a TO92 package is a 3-terminal adjustable current source with a 10,000 to 1 range in operating current, excellent current regulation and a wide dynamic voltage regulation of 1V to 40V. Current is established with one resistor connected between pins 1 (R) and 3 (V⁻), and no other parts are required. The current is equal to 0.0677V divided by the resistor in ohms (i.e. for 1mA, R = 68Ω) at 25°C. Currents may be set in the range 1µA to 10mA and regulation is 0.02% per volt. Initial current accuracy is ± 3% typical. Reverse voltages of up to 20V will draw only a few microamps allowing the device to act as a rectifier and current source in AC applications. The current is also directly proportional to the temperature at the rate +0.33% per °C. Zero drift operation can be obtained by adding one resistor and one diode. Applications include bias networks, surge protection, low power reference, ramp generation, LED driver, and temperature sensing.

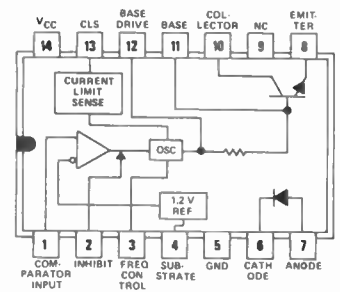


Order

WQ32K (LM334) £1.30

TL497A Switching Voltage Regulator

The TL497A has all the active functions required of a switching voltage regulator and can also be used as the control element to drive external components for high power output applications. With only six external components; three resistors; two capacitors and an inductor, the TL497A will operate in numerous voltage conversion applications: step-up, step-down, invert etc, with as much as 85% of the source power delivered to the load.



Specification

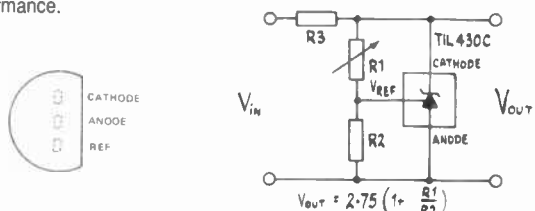
Input voltage:	4.5V to 12V (15V max)
Output voltage:	V _{in} + 2V to 30V
Power switch current:	500mA
Diode forward current:	500mA
High level inhibit input voltage:	2.5V (min)
current:	0.8mA (V _{in} = 5V)
Low-level inhibit input voltage:	0.8V (max)
current:	5µA (V _{in} = 0V)
Comparator reference voltage:	1.2V (V _{in} = 5V)
Comparator input bias current:	40µA (V _{in} = 6V)
Switch on-state voltage:	130mV (I _{out} = 100mA)
Switch off-state current:	10µA
Current-limit sense voltage:	0.45V to 1V
Diode forward voltage:	0.9V (I _{out} = 100mA)
On-state supply current:	11mA
Off-state supply current:	6mA

Order

YY78K (TL497A) £1.95

TL430 Adjustable Zener Diode

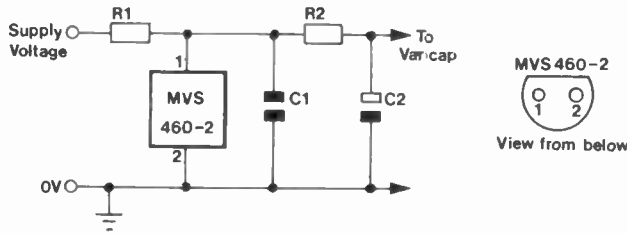
A three terminal adjustable shunt regulator featuring excellent temperature stability, wide operating current range, and low output noise. The output voltage may be set by two external resistors to any voltage in the range 3V to 30V. The device can replace zener diodes in many applications giving improved performance.



Order

YY77J (TL430C) £1.30

MVS460 Varicap Voltage Stabiliser



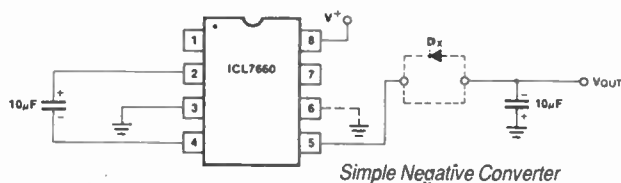
A voltage stabiliser for varicap diodes. Stabilised voltage $33V \pm 1V$. Pin 1 is connected to case. Temperature coefficient: $-2.3mV/^\circ C$. Supply current: 5mA. Differential internal resistance: 9Ω . Supply voltage must be greater than 34V. In circuit R1 is equal to the supply voltage minus 33V divided by 0.005, in ohms. E.g. for supply $V = 40V$, $R1 = 1k5$, $R2 = 22\Omega$, $C1 = \text{Ceramic } 1000pF$, $C2 = 4.7\mu F \text{ } 63V$.

Order

UF29G (MVS460-2) 95p

ICL7660 Voltage Converter

A voltage converter that will provide a negative voltage output numerically equal to the positive voltage input in the range 1.5V to 10V. Pin 6 should be tied to ground for supply voltages below 3.5V and for supply voltages in excess of 6.5V a diode should be connected in series with the output. The output is like an ideal voltage source in series with 70Ω so for a load current of $-10mA$ and a supply voltage of +15V, the output voltage will be $-4.3V$.



Simple Negative Converter

Specification

Supply current ($R_L = \infty$):	170µA
Supply voltage:	1.5V to 10V
Power dissipation:	300mW max
Max load current:	$\frac{\text{Supply } V - \text{Min } V_{out}}{70} < 40mA$

Order

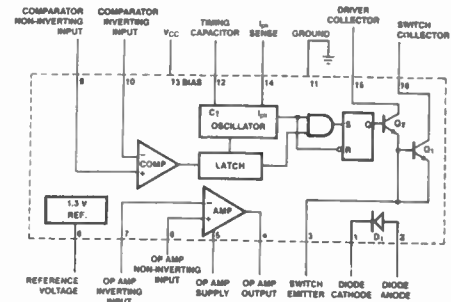
YY75S (ICL7660CPA) £2.85

µA78S40 Switching Regulator

A versatile switching regulator subsystem consisting of a temperature-compensated voltage reference, an oscillator whose duty-cycle is controllable and having an active current limit circuit, an error amplifier, a high current, high voltage output switch, a power diode and an uncommitted op-amp. It may be used to generate higher or lower regulated voltage supplies or even ones of opposite polarity from the power rail available. The output is adjustable from 1.3V to 40V and will directly supply currents up to 1.5A or drive external transistors for larger currents.

Characteristics (typical)

Supply voltage	2.5V to 40V
Supply current	1.8mA @ $V_{IN} = 5V$ 2.3mA @ $V_{IN} = 40V$
Op-amp supply current	2.2mA max @ $V_{IN} = 5V$ 3.2mA max @ $V_{IN} = 40V$
Reference voltage	1.245V
V_{REF} line regulation	0.04mV/V
V_{REF} load regulation	0.2mV/mA
Oscillator voltage swing	0.5V
Oscillator max frequency	75kHz
Current limit sense voltage	250mV min/350mV max
Output transistor h_{FE}	70
Power diode forward voltage drop	1.25V @ 1A
Comparator input offset voltage	1.5mV
input bias current	35nA
input offset current	5nA
Op-amp input offset voltage	4mV
input bias current	30nA
input offset current	5nA
voltage gain	108dB
output source current	150mA
output sink current	35mA
slew rate	0.6V/µs



Order

UF37S (µA78S40) £2.80

TL494 Switch Mode Power Supply



A fixed frequency, pulse width modulation control circuit designed primarily for switch mode power supply control. The chip contains two error amplifiers, an adjustable oscillator, a dead-time control comparator, pulse-steering control flip-flop, a 5V 1% precision regulator and output control circuits.

Specifications

Supply voltage:	7V to 40V
Collector output voltage:	40V max
Collector output current:	200mA each max
Current into pin 3:	0.3mA max
Timing capacitor C_t :	470pF to 10µF
Timing resistor R_t :	1.8kΩ to 500kΩ
Oscillator frequency:	1kHz to 300kHz

Characteristics (with $V_S = 15V$, $f = 10kHz$) typical

Reference section	
Output voltage at 1mA:	5V
Input regulation 7 to 40V:	2mV
Output regulation 1 to 10mA:	1mV

Oscillator section

Frequency $C_t = 0.01\mu F$, $R_t = 12k\Omega$:	10kHz
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Amplifier sections

Input offset voltage:	2mV
Input offset current:	25nA
Input bias current:	0.2µA
Open-loop voltage gain:	95dB
Common mode input voltage:	$-0.3V$ to $V_S - 2V$
Unity gain bandwidth:	800kHz
Output source current:	$> -2mA$

Output section

Collector-emitter saturation voltage	(common emitter): $V_E = 0V$, $I_C = 200mA$: 1.1V (emitter follower): $V_C = 15V$, $I_E = -200mA$: 1.5V
Output control input current ($V_{IN} = V_{REF}$):	3.5mA max

Dead-time control section

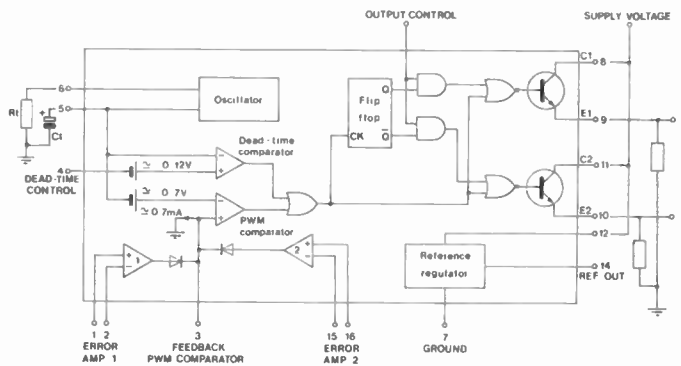
Input bias current ($V_{IN} = 0$ to 5.25V):	$-2\mu A$
Max duty cycle ($V_{IN} = 0V$):	$> 45\%$
Input threshold voltage (Zero duty cycle):	3V
(Max duty cycle):	0V

PWM comparator section

Input threshold voltage (Zero duty cycle):	4V
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Whole device

Supply current:	7.5mA average
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Order

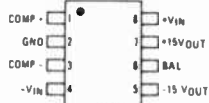
RA85G (TL494CN) £1.95

VOLTAGE REGULATOR IC's 4195 ±15V Dual-Tracking Regulator

A dual polarity tracking regulator designed to provide balanced positive and negative 15V output voltages at currents up to 100mA per rail. The IC is fully protected against short circuit and shuts down if the internal temperature exceeds 175°C. For operation from the mains only six additional components are required. A centre-tapped 12V mains transformer, a bridge rectifier, two 100µF 25V capacitors (one for each input to earth) and two 10µF 25V capacitors (one on each output to earth). In use take care to ensure that the power dissipation in the IC does not exceed 600mW. Power dissipation = (input V - 15) × load current. Add both rails together. For instance with the components mentioned above the absolute max. current that could be drawn is 60mA per rail because with a 12V transformer the output of the bridge will be around 20V.

Electrical Characteristics

Line regulation:	2mV
Load regulation:	5mV
Output V temp stability:	0.005%/°C
Standby current drain:	+1.5mA
Input voltage range:	Min: 18V, Max 30V
Output voltage tracking:	+50mV
Ripple rejection:	75dB
Input/Output V differential:	Minimum 3V
Short-circuit current:	220mA
Output noise voltage:	60µV rms



Printed Circuit Board

A fibre glass printed circuit board with component designations printed on it and designed to be used with our Min Tr 12V and providing a fully stabilised positive and negative 15V output at up to 50mA per rail. Each output must be decoupled by a 10µF 25V to earth at the point of use. The centre tap of the transformer is connected to 0V on the board. The following components are also required.

BR1	Bridge W01		
C31,32	Axial 1000µF 25V	IC4	4195 8-pin DIL
C33,34,35,36	Polyester 0.1µF	R30	Min Res 1k8

(R30 is provided so that an LED power on indicator can be provided — anode to resistor, cathode to 0V). Size: 87 x 40mm. Fixing centres: 80 x 30mm x 6BA.

Important Note:

If the current to be drawn is around 100mA total, we recommend soldering the IC directly to the PCB without the use of a socket so that the thickened tracks on the PCB can assist in dissipating the heat generated in the IC.

Order

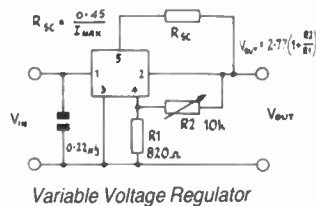
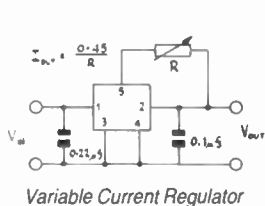
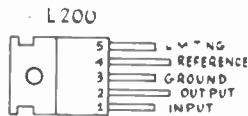
XX04E (15V Supply PCB)	85p
XX02C (4195)	£1.80

L200 Adjustable Voltage and Current Regulator

A 5-terminal regulator whose voltage and current are programmable. Current limiting, power limiting, thermal shutdown and input overvoltage protection make the L200 virtually indestructible.

Specification

Output current (max):	2A
Output voltage:	2.85V to 36V
Line regulation:	0.03% typical
Load regulation:	0.1% typical
Ripple rejection:	70dB typical
Quiescent current:	4.2mA
Input voltage range:	4.85V to 40V
Output resistance:	1.5mΩ
Output noise voltage:	80µV
Short circuit current:	2.5A



Order

YY74R (L200)	£1.75
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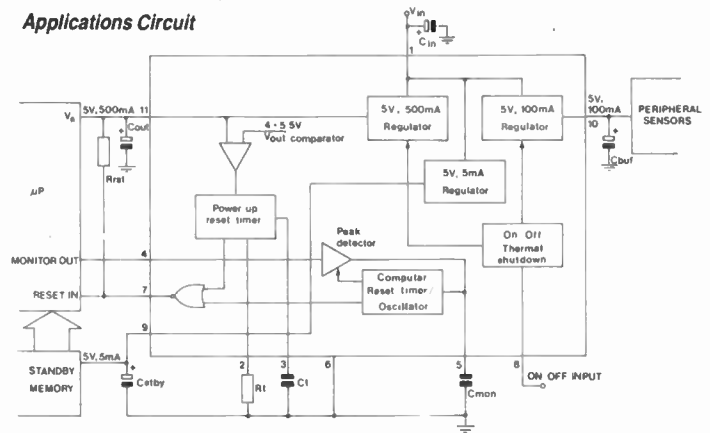
LM2984C Microprocessor Power Supply System



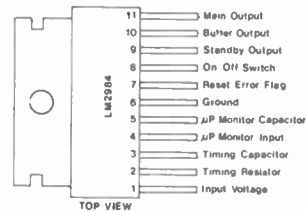
A positive voltage regulator having three independent tracking outputs capable of delivering the power for logic circuits, peripheral sensors and standby memory in a typical microprocessor system. The IC monitors the microprocessor and its own high current regulator and if any error condition is sensed a reset flag is set and

maintained until the error ends. The LM2984 has very low dropout voltage, just 0.6V and quiescent current can be reduced to 1mA in standby mode. It is also protected against short circuits, thermal overloads, reverse battery, reverse transients and overvoltage.

Applications Circuit



Component	Typical value	Range	Comments
Cin	1µF	0.47µF to 10µF	Only needed if far from psu filter
Rt	130kΩ	24kΩ to 1MΩ	Sets internal timing currents
Ct	0.33µF	0.033µF to 3.3µF	Sets power-up reset delay
Cmon	0.47µF	0.047µF to 4.7µF	Sets time window for monitor
Rrst	10kΩ	5kΩ to 100kΩ	Load for computer reset input
Cstby	10µF	10µF to unlimited	Required for stability, larger values improve regulation
Cbuf	10µF	10µF to unlimited	values improve regulation during transients
Cout	10µF	10µF to unlimited	



Specification (typical at Vin = 14V, 25°C)

	Main	Buffer	Standby
Output voltage:	5V	5V	5V
Line regulation (7V to 26V):	5mV	5mV	5mV
Load regulation:	12mV	15mV	6mV
Output impedance:	12mΩ	200mΩ	900mΩ
Quiescent current:	38mA	8mA	1.2mA
Output noise voltage:	100µV	100µV	100µV
Ripple rejection:	>70dB	>70dB	>70dB
Current limit:	0.92A	0.23A	15mA
Maximum input voltage:	26V	26V	35V
Reverse polarity input voltage DC:	-15V	-15V	-15V
Tracking (any output to any other):	±30mV		

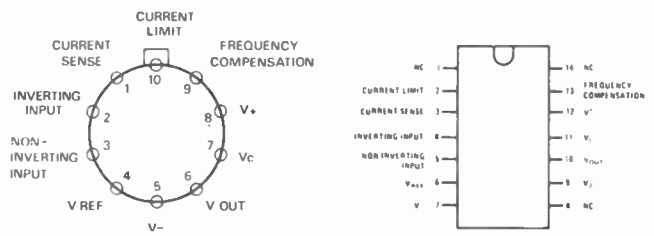
Order

RA94C (LM2984C)	Not yet available
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µA723C Variable Voltage Regulator

Formulae for Various Output Voltages

Outputs from +2 to +7 Volts	Current Limiting
[Figure 1] $V_{OUT} = |V_{REF} \times \frac{R_2}{R_1 + R_2}|$	$I_{LIMIT} = \frac{V_{SENSE}}{R_{SC}} \quad V_{SENSE} = 0.7V.$
Outputs from +7 to +37 Volts	Outputs from -6 to -250 Volts
[Figures 2,4] $V_{OUT} = |V_{REF} \times \frac{R_1 + R_2}{R_1}|$	[Figure 3] $V_{OUT} = | \frac{V_{REF}}{2} \times \frac{R_1 + R_2}{R_1} | ; R_3 = R_4$



Viewed from top. Pin 5 is connected to case.

Basic Low Voltage Regulator

($V_{OUT} = 2V$ to $7V$)

$$R_3 = (R_1 \times R_2) \div (R_1 + R_2) \text{ for min temp drift}$$

Basic High Voltage Regulator

($V_{OUT} = 7V$ to $37V$)

R_3 is as Fig. 1 but can be omitted

Negative Voltage Regulator

For metal can applications where V_Z is needed connect a 6.2V zener in series with V_{OUT}

Positive Voltage Regulator

(External NPN pass transistor)

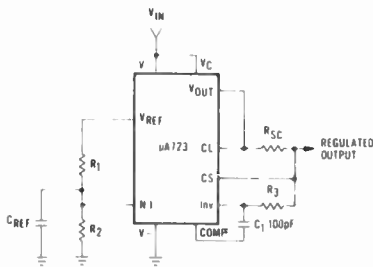


Figure 1

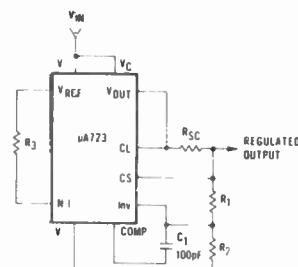


Figure 2

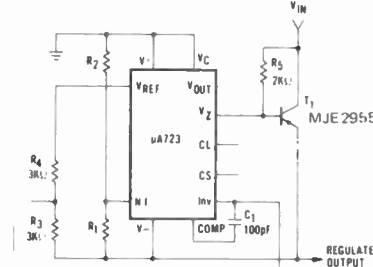


Figure 3

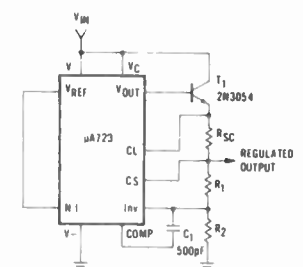


Figure 4

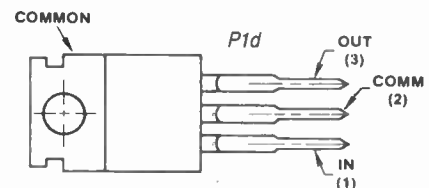
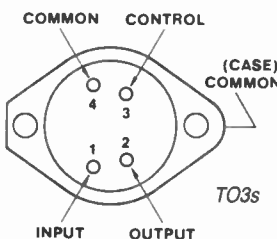
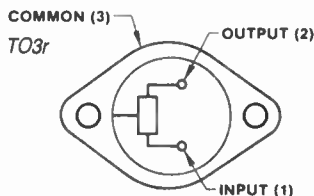
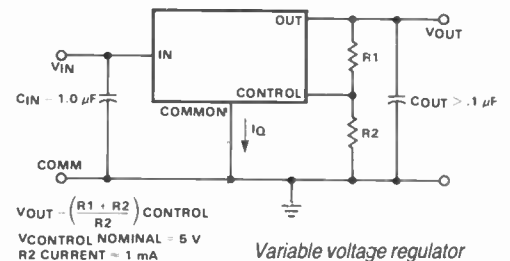
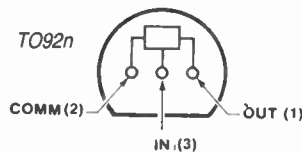
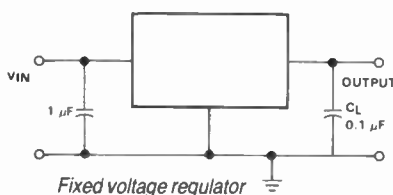
Order

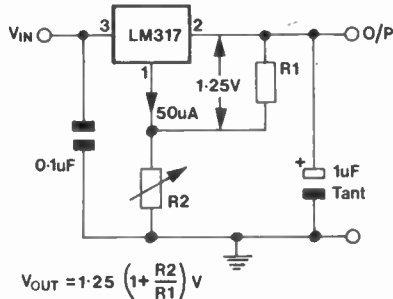
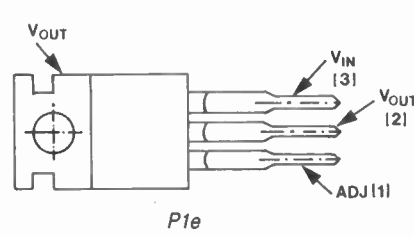
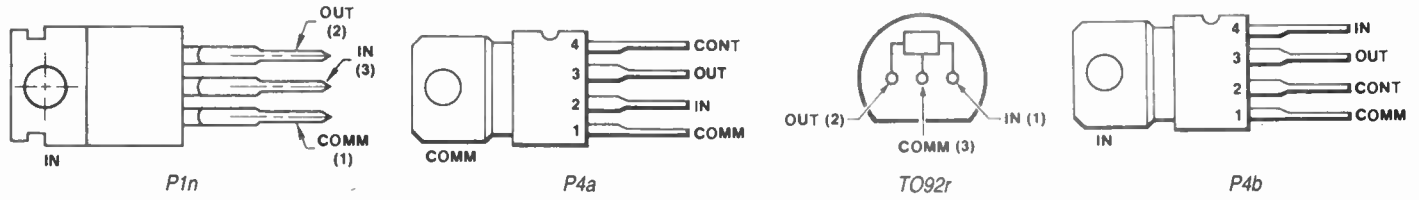
BL22Y (uA723C TO99)	98p
QL21X (uA723C 14-pin DIL)	65p

Voltage Regulators

Type No.	Output Current (max)	Output Voltage (typ)	Line Regulation (typ)	Load Regulation (typ)	Ripple Rejection (dB) (typ)	Quiescent Current (typ)	Input Voltage Range	Output Resistance	Output Noise Voltage	Short Circuit Current	Case Style
μA78L05AWC	100mA	+5V ±4%	0.36%	0.4%	62dB	3mA	7V to 30V	0.2Ω	40μV	—	TO92r
μA78L12AWC	100mA	+12V ±4%	0.25%	0.25%	54dB	3mA	14.5V to 35V	0.2Ω	80μV	—	TO92r
μA78L15AWC	100mA	+15 ±4%	0.25%	0.25%	51dB	3.1mA	17.5V to 35V	0.2Ω	90μV	—	TO92r
LM317L	100mA	+1.2V to 37V	0.01%/V	0.1%	80dB	3.5mA	3V to 40V	0.08Ω	150μV	200mA	TO92s
μA78M05UC	500mA	+5V ±4%	0.06%	0.4%	80dB	4.5mA	7V to 25V	0.05Ω	40μV	300mA	P1d
μA78M12UC	500mA	+12V ±4%	0.07%	0.2%	80dB	4.8mA	14.5V to 30V	0.05Ω	75μV	240mA	P1d
μA78M15UC	500mA	+15V ±4%	0.07%	0.17%	70dB	4.8mA	17.5V to 30V	0.05Ω	90μV	240mA	P1d
μA78MGU1C	500mA	+5V to 30V	1%(max)	1%(max)	62dB	5mA	7.5V to 40V	0.05Ω	50μV	—	P4a
LM317M	500mA	+1.2V to 37V	0.01%/V	0.1%	80dB	3.5mA	3V to 40V	0.04Ω	150μV	800mA	P4c
μA7805UC	1A	+5V ±4%	0.06%	0.2%	78dB	4.2mA	7V to 25V	0.017Ω	40μV	750mA	P1d
μA7812UC	1A	+12V ±4%	0.085%	0.07%	71dB	4.3mA	14.5V to 30V	0.018Ω	75μV	350mA	P1d
μA7815UC	1A	+15V ±4%	0.075%	0.055%	70dB	4.4mA	17.5V to 30V	0.019Ω	90μV	230mA	P1d
μA78GU1C	1A	+5V to 30V	1%(max)	1%(max)	62dB	5mA	7.5V to 40V	0.02Ω	50μV	—	P4a
μA7805KC	1.5A	+5V ±4%	0.06%	0.3%	78dB	4.2mA	7V to 25V	0.017Ω	40μV	750mA	TO3r
μA7815KC	1.5A	+15V ±4%	0.075%	0.08%	70dB	4.4mA	17.5V to 30V	0.019Ω	90μV	230mA	TO3r
LM317T	1.5A	+1.2V to 37V	0.01%/V	0.1%	80dB	3.5mA	3V to 40V	0.012Ω	150μV	2.2A	P1e
μA78H05KC	5A	+5V ±4%	0.2%	0.2%	60dB	10mA	8.5V to 25V	0.002Ω	40μV	7A	TO3r
μA78H12KC	5A	+12V ±4%	0.17%	0.17%	60dB	10mA	15.5V to 25V	0.002Ω	75μV	7A	TO3r
μA78HGKC	5A	+5V to 20V	1%(max)	1%(max)	60dB	10mA	8.5V to 25V	0.002Ω	50μV	7A	TO3s
LM338K	5A	+1.2V to 32V	0.005%/V	0.1%	75dB	3.5mA	3V to 35V	0.001Ω	150μV	8A	TO3a
μA78P05SC	10A	+5V ±4%	0.5%(max)	1%(max)	60dB	10mA	7.5V to 40V	—	—	—	TO3r
μA79L05AWC	100mA	-5V ±5%	1%	0.2%	60dB	3mA	-7V to -25V	—	40μV	—	TO92n
μA79L12AWC	100mA	-12V ±5%	1%	0.2%	55dB	3mA	-14.5V to -35V	—	80μV	—	TO92n
μA79L15AWC	100mA	-15V ±5%	1.5%	0.3%	52dB	3mA	-17.5V to -35V	—	90μV	—	TO92n
μA79M05UC	500mA	-5V ±4%	0.14%	1.5%	60dB	1mA	-7V to -25V	—	125μV	140mA	P1n
μA79M12UC	500mA	-12V ±4%	0.075%	0.55%	60dB	1.5mA	-14.5V to -30V	—	300μV	140mA	P1n
μA79M15UC	500mA	-15V ±4%	0.06%	0.45%	59dB	1.5mA	-17.5V to -30V	—	375μV	140mA	P1n
μA79MGU1C	500mA	-2.23V to -30V	1%(max)	1%(max)	50dB	2.5mA	-7V to -30V	—	—	—	P4b
μA7905UC	1A	-5V ±4%	0.06%	0.2%	60dB	1mA	-7V to -25V	—	125μV	750mA	P1n
μA7912UC	1A	-12V ±4%	0.085%	0.07%	60dB	1.5mA	-14.5V to -30V	—	300μV	350mA	p1n
μA7915UC	1A	-15V ±4%	0.075%	0.055%	60dB	1.5mA	-17.5V to -30V	—	375μV	230mA	P1n
μA79GU1C	1A	-2.23V to -30V	1%(max)	2%(max)	50dB	2mA	-7V to -40V	—	—	—	P4b

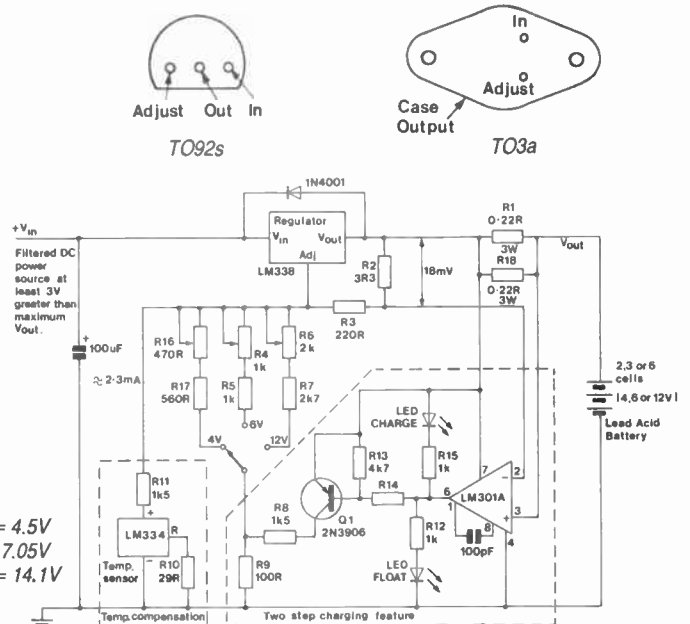
All viewed from above





Basic regulator using LM317, LM338

For 4V batteries trim R16 for $V_{OUT} = 4.5V$
 For 6V batteries trim R4 for $V_{OUT} = 7.05V$
 For 12V batteries trim R6 for $V_{OUT} = 14.1V$



Temperature compensated two-step sealed lead acid battery charger

Voltage Regulator Application Circuits

Circuits are shown and pcb's are available for regulated power supplies as follows:

100mA Range PCB

For up to 100mA at +5V, +12V, +15V, -5V, -12V or -15V

Order

YQ39N (0.1A Reg PSU PCB)..... £1.40

500mA/1A +V Range PCB

For up to 500mA at +5V, +12V or +15V or up to 1A at +5V, +12V or +15V.

Order

YQ40T (0.5/1A Reg +V PS PCB)..... 98p

500mA/1A -V Range PCB

For up to 500mA at -5V, -12V or -15V or up to 1A at -5V, -12V or -15V.

Order

YQ41U (0.5/1A Reg -V PS PCB)..... 98p

500mA/1A Variable +V PCB

For up to 500mA or up to 1A with variable voltage from +5V to +27V output.

Order

YQ54J (0.5/1A Vereg Pos PCB)..... 98p

500mA/1A Variable -V PCB

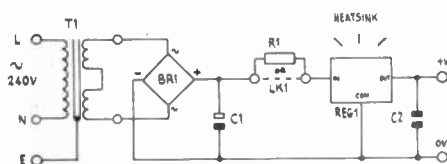
For up to 500mA or up to 1A with variable voltage from -5V to -27V output.

Order

YQ55K (0.5/1A Vereg Neg PCB)..... 98p

PARTS LISTS

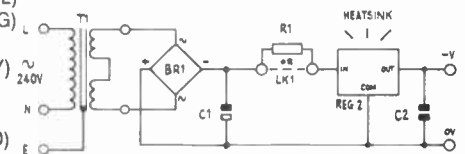
100mA PSU Range



100mA Positive Voltage Regulator

The following parts are required for all voltages.

- 1 0.1A Reg PSU PCB (YQ39N)
- 7 Pins 2141 (FL21X)
- 1 Heatsink 92F (HQ79L)
- 2 Bolt 6BA 1/2in (BF06G)
- 2 Nut 6BA (BF18U)
- 2 Washer 6BA (BF22Y)
- 1 Tag 6BA (BF29G)
- BR1 W005 (QL37S)
- C2 Disc 0.01µF (BX03D)



100mA Negative Voltage Regulator

Additional parts required

+5V

- T1 Sub-Min Tr 6V (WB00A)
- C1 Axial 330µF 25V (FB68Y)
- Reg 1 µA78L05AWC (QL26D)
- Link 1 Yes

+12V

- T1 Min Tr 6V (WB06G)
- C1 Axial 680µF 40V (FB79L)
- Reg 1 µA78L12AWC (WQ77J)
- Link 1 Yes

+15V

- T1 Min Tr 12V (WB10L)
- C1 Axial 680µF 40V (FB79L)
- Reg 1 µA78L15AWC (QL27E)
- R1 W/W Min 47Ω
- Link 1 No

-5V

- T1 Sub-Min Tr 6V (WB00A)
- C1 Axial 330µF 25V (FB68Y)
- Reg 2 µA79L05AWC (WQ85G)
- Link 1 Yes

-12V

- T1 Min Tr 6V (WB06G)
- C1 Axial 680µF 40V (FB79L)
- Reg 2 µA79L12AWC (WQ86T)
- Link 1 Yes

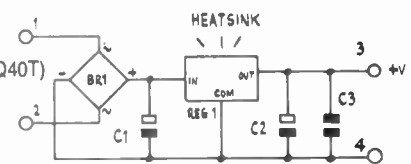
-15V

- T1 Min Tr 12V (WB10L)
- C1 Axial 680µF 40V (FB79L)
- Reg 2 µA79L15AWC (WQ87U)
- R1 W/W Min 47Ω
- Link 1 No

500mA/1A +V PSU Range

The following parts are required for all voltages.

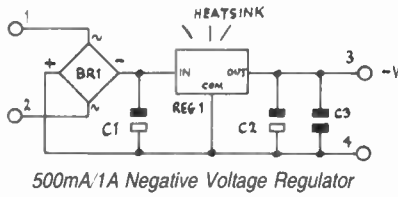
- BR1 W01 (QL38R)
- C2 Axial 10µF 63V (FB23A)
- C3 Disc 0.1µF (BX03D)
- 1 0.5/1A Reg PSU Pos V (YQ40T)
- 1 8W Heatsink (HQ81C)
- 4 Pins 2141 (FL21X)
- 3 Bolt 6BA 1/2in (BF06G)
- 3 Nut 6BA (BF18U)
- 3 Washer 6BA (BF22Y)



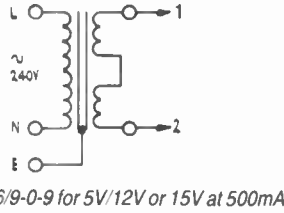
500mA/1A Positive Voltage Regulator

Additional parts required

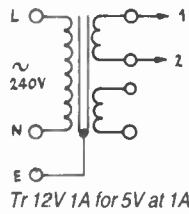
- +5V 500mA**
 T1 Min Tr 6V (WB06G)
 C1 Axial 680 μ F 40V (FB79L)
 Reg 1 μ A78M05UC (QL28F)
- +12V 500mA**
 T1 Min Tr 9V (WB11M)
 C1 Axial 680 μ F 40V (FB79L)
 Reg 1 μ A78M12UC (QL29G)



- +15V 500mA**
 T1 Min Tr 9V (WB11M)
 C1 Axial 680 μ F 40V (FB79L)
 Reg 1 μ A78M15UC (QL30H)

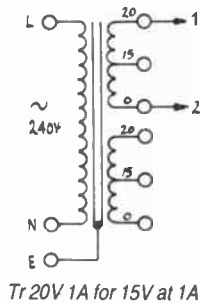
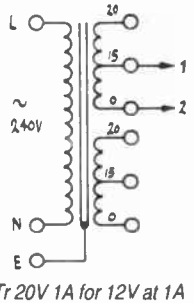


- +5V 1A**
 T1 Tr 12V 1A (WB25C)
 C1 Axial 2200 μ F 40V (FB91Y)
 Reg 1 μ A7805UC (QL31J)



- +12V 1A**
 T1 Tr 20V 1A (WB12N)
 C1 Axial 2200 μ F 40V (FB91Y)
 Reg 1 μ A7812UC (QL32K)

- +15V 1A**
 T1 Tr 20V 1A (WB12N)
 C1 Axial 2200 μ F 40V (FB91Y)
 Reg 1 μ A7815UC (QL33L)

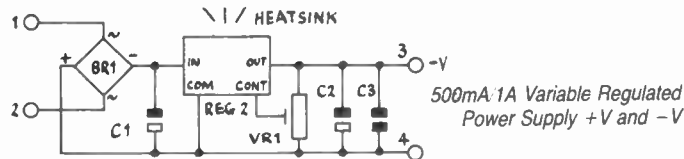
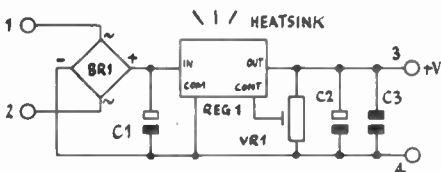


500mA/1A -V PSU Range

The parts required are exactly the same as those for the 500mA/1A +V range except:

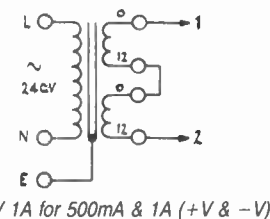
- PSU All voltages 0.5/1A Reg PSU Neg V: (YQ41U)
 Reg 1: -5V 500mA: μ A79M05UC (WQ88V)
 -12V 500mA: μ A79M12UC (WQ89V)
 -15V 500mA: μ A79M15UC (WQ90X)
 -5V 1A: μ A7905UC (WQ92A)
 -12V 1A: μ A7912UC (WQ93B)
 -15V 1A: μ A7915UC (QL36P)

500mA/1A Variable Regulated PSU's



The following parts are required for all voltages

- BR1 W01 (QL38R)
 C1 Axial 2200 μ F 40V (FB91Y)
 C2 Axial 10 μ F 63V (FB23A)
 C3 Disc 0.1 μ F (BX03D)
 VR1 Hor Sub - Min Preset 10k (WR58N)
 1 8W Amp Heatsink (HQ81C)
 4 Pins 2141 (FL21X)
 1 Tr 12V 1A (WB25C)
 3 Bolt 6BA 1/2in (BF06G)
 3 Nut 6BA (BF18U)
 3 Washer 6BA (BF22Y)



Additional parts required

- 500mA +5V to +27V**
 Reg 1 μ A78MGU1C (WQ78K)
 1 0.5/1A Vreg PSU +V (YQ54J)
- 500mA -5V to -27V**
 Reg 2 μ A79MGU1C (WQ91Y)
 1 0.5/1A Vreg PSU -V (YQ55K)
- 1A +5V to +27V**
 Reg 1 μ A78GU1C (WQ79L)
 1 0.5/1A Vreg PSU +V (YQ54J)
- 1A -5V to -27V**
 Reg 2 μ A79GU1C (WQ94C)
 1 0.5/1A Vreg PSU -V (YQ55K)

Voltage Regulator Equivalents

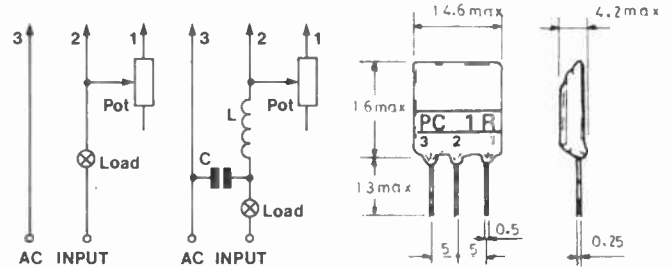
All equivalents shown are direct pin for pin replacements.

- μ A7805KC = LM7805KC = MC7805CK = LM340K-5.0
 μ A7815KC = LM7815KC = MC7815CK = LM340K-15
 μ A7805UC = LM340T-05 = MC7805CP = SN72905
 μ A7812UC = LM3402-12 = MC7812CP = SN72912
 μ A7815UC = LM340T-15 = MC7815CP = SN72915
 μ A78M05UC = LM341P-05 = MC78M05CP
 μ A78M12UC = LM341P-12 = MC78M12CP
 μ A78M15UC = LM341P-15 = MC78M15CP
 μ A78L05WC = LM78L05CZ = MC78L05
 μ A78L15WC = LM78L15CZ = MC78L15
 μ A7915UC = LM320T-15 = MC7915CP

1A Power Controller (PC1R)

Designed primarily for use as a light dimmer, the PC1R is a completely integrated thick film hybrid circuit that can control up to 250W at 240V AC. The IC requires only the addition of a Pot Lin 220k to give full control. If required suppression components may be added as shown:

(C = IS Cap 0.1 μ F, L = RF Supp Choke 1A).



Characteristics

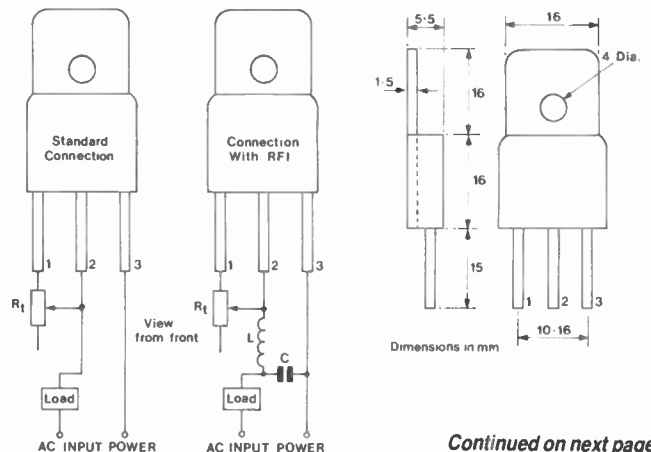
- Max RMS on-state current: 1.1A
 Peak one cycle surge current: 120A
 Off state leakage current: 1.5mA max
 Minimum holding load current: 25mA
 Input voltage 50Hz: 240V RMS
 Repetitive peak voltage: 600V
 Forward volts drop at max current: 1.5V
 Hysteresis: 5% (typical)
 Total conduction phase angle: 0 to 160° (typical)
 Controlled conduction phase angle: 30 to 160° (typical)
 Power transfer at max current: 99%
 Insulation withstand capability: 2000V for 1 minute
 Ambient operating temperature: -40 to +70°C

Order

QY37S (1A Power Controller) £3.95

12A Power Controller (PC12R)

A completely integrated thick film hybrid circuit that can control up to 2.8kW at 240V AC. The IC requires only the addition of a Pot Lin 220k to give full control.



Continued on next page.

12A Power Controller *Continued*

For load currents below 5A, an 8°C/W heatsink is required; for currents up to 10A, 4°C/W; and for 12A, 3.5°C/W. The heatsink may be bolted directly to the copper mounting tab with a smear of silicone grease. The tab may be earthed as it is completely isolated and will withstand 2000V AC for at least one minute between any lead and the tab.

Characteristics

Max RMS on-state current:	12A
Peak one cycle surge current:	120A
Off state leakage current:	1.5mA max
Minimum holding load current:	25mA
Input voltage 50Hz:	240V RMS
Repetitive peak voltage:	600V
Forward voltage drop at max current:	1.8V
Hysteresis:	5% (typical)
Total conduction phase:	0 to 160° (typical)
Controlled conduction phase angle:	30 to 160° (typical)
Power transfer at max current:	99%
Tab surface operating temperature:	-40 to +70°C
Insulation withstand capability:	2000V for one minute

Order

QY38R (12A Power Controller)..... £7.95

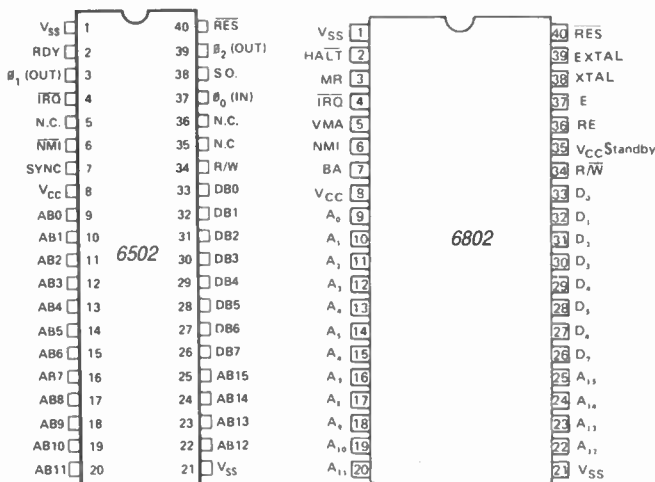
MICROPROCESSOR IC'S

6502 Microprocessor

An 8-bit microprocessor in a 40-pin DIL package. The device requires only one +5V supply and the bus is directly compatible with MC6800 series IC's. The IC can address up to 64K bytes of memory directly with its 16-bit address lines. There are 13 addressing modes, 56 instructions and 7 internal registers. The 6502 requires a single phase TTL clock operating from a 1MHz crystal.

Order

QQ02C (6502)..... £7.95



MC6802P Microprocessor

An 8-bit microprocessor in a 40-pin DIL package. The device contains virtually a complete MC6800P as well as an internal clock oscillator (requiring the addition of a 4MHz crystal) and driver, plus 128 bytes of RAM located between 0000H and 007FH. The first 32 bytes of RAM at 0000H to 001FH may be retained by applying a 4.5V battery to V_{CC} standby (pin 35) when power to the rest of the system is switched off. Standby current is around 5mA, whilst typical powered-up current is around 20mA.

Order

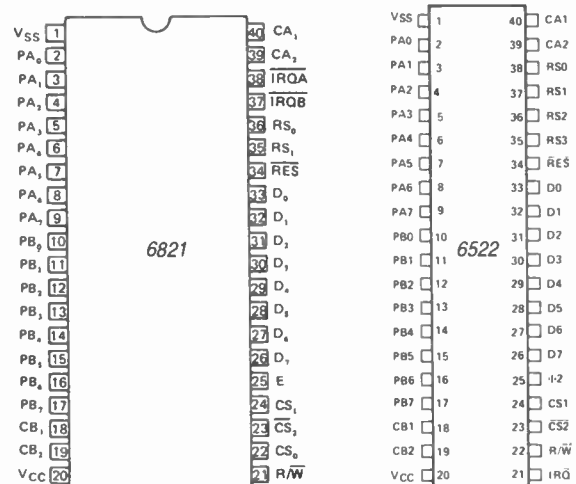
WQ44X (MC6802P)..... £4.95

MC6821P (6521) Peripheral Interface Adaptor (PIA)

The IC provides a universal means of interfacing parallel data to a microprocessor. One chip is capable of interfacing the 8-bit data bus of the MPU to two 8-bit peripheral buses. Data are able to flow in either direction to and from either peripheral buses under the control of the microprocessor. The two peripheral bus output/inputs are slightly different from one another in that i/o A will drive TTL or the base of a transistor up to 1mA at 1.5V in output mode while i/o B has 3-state capability allowing interface with another MPU.

Order

WQ46A (MC6821P)..... £2.95



6522 Versatile Interface Adaptor (VIA)

A very flexible I/O device that contains a pair of very powerful 16-bit interval timers, a serial-to-parallel/parallel-to-serial shift register and input data latching on the peripheral ports. Expanded handshaking capability allows control of bi-directional data transfers between VIA's in multiple processor systems. Control of peripheral devices is handled primarily through two 8-bit bi-directional ports. Each line can be programmed as either an input or an output. Several peripheral I/O lines can be controlled directly from the interval timers for generating programmable frequency square waves or for counting externally generated pulses. To facilitate control of the many powerful features of this chip, an interrupt flag register, an interrupt enable register and a pair of function control registers are provided.

Order

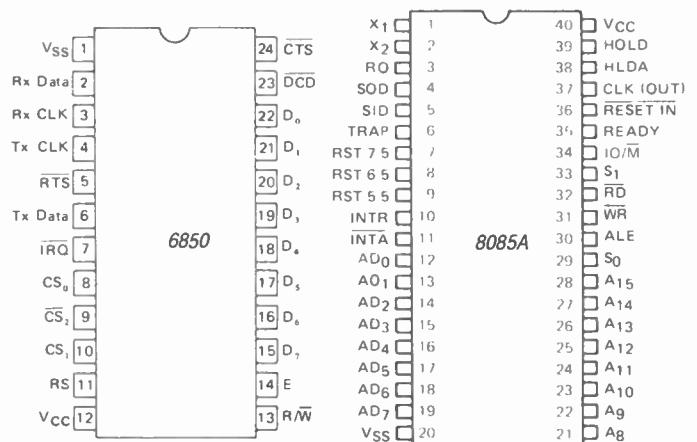
UF25C (6522 VIA)..... £5.95

MC6850P Asynchronous Communications Interface Adaptor

This IC will interface the microprocessor data bus to serial asynchronous data, both for input and output. The parallel data of the MPU bus is serially transmitted and received by this IC with proper formatting and error checking. A programmable control register provides variable word lengths (8 or 9-bit), clock division (/16, /64), transmit, receive and interrupt control. The device has optional even or odd parity, and performs parity, overrun and framing error checking. Transmissions up to 500k bauds (kbps) are possible and three control lines are provided for control of a modem for line transmission (e.g. to cassette recorder or amateur radio transceiver).

Order

WQ48C (MC6850P)..... £2.45



8085A Microprocessor

This IC is an 8-bit microprocessor 100% software compatible with the now discontinued 8080A. However the 8085A uses a multiplexed data bus with half of the 16-bit address bus. The IC runs directly from a 6.144MHz crystal and has a serial input and output port in addition to the parallel buses.

Order

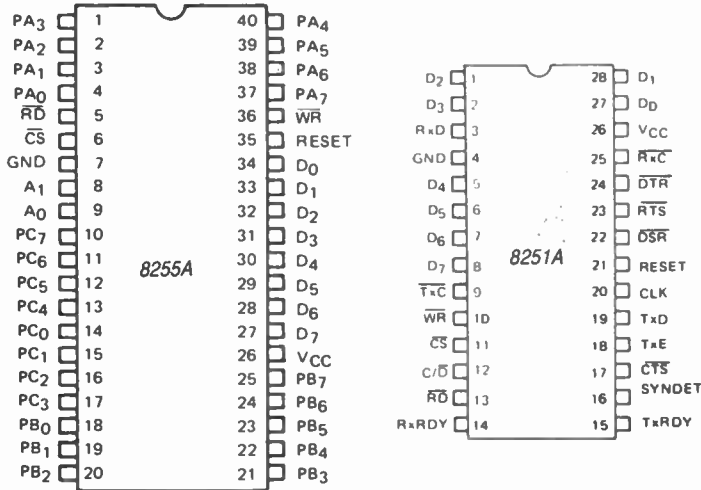
YH41U (8085A)..... £5.95

8255A Peripheral Interface Adaptor

A general purpose I/O device having 24 I/O pins which may be individually programmed in two groups of 12 and used in 3 major modes of operation. In mode 0 each group of 12 I/O pins may be programmed in sets of four to be input or output. In mode 1 each group may be programmed to have 8 lines of I/O, and of the remaining 4, three are used for handshaking and interrupt control signals. Mode 2 is a bidirectional bus mode which uses 8 lines for the bus and 5 lines (one borrowed from the other group) for handshaking.

Order

YH50E (8255A) £4.15



8251A Programmable Communication Interface

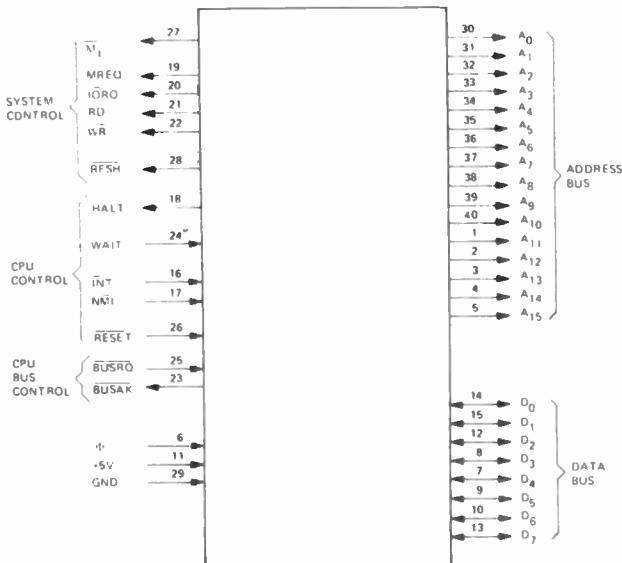
This USART chip is programmed by the MPU to operate using virtually any serial data transmission technique presently in use. It interfaces the MPU's parallel data bus with any peripheral requiring serial data (e.g. cassette recorder, modem etc.). Features are: synchronous mode — 5- to 8-bit characters, internal or external character synchronisation and automatic sync insertion; asynchronous mode — 5- to 8-bit characters, clock rate (1/16, /64), break character generation, 1, 1½ or 2 stop bits, false start bit detection, automatic break detect and handling; up to 64k baud (kbps); full duplex double buffered transmitter and receiver; error detection-parity, overrun and framing; all inputs and outputs fully TTL compatible.

Order

YH49D (8251) £3.95

Z80A-CPU Microprocessor

This 40-pin DIL IC is an extremely powerful 8-bit microprocessor having 158 instructions including all of the 8080 instructions giving total software compatibility. Thus programs written for the 8080 may be run on the Z80 and later updated to make use of the powerful Z80 instruction set. Typically the Z80 requires 25% to 50% less memory space than the 8080 and gives 5 times the throughput of the 8080. There are 17 internal registers including two real index registers, and three modes of fast interrupt response. Static memories can be interfaced using only an



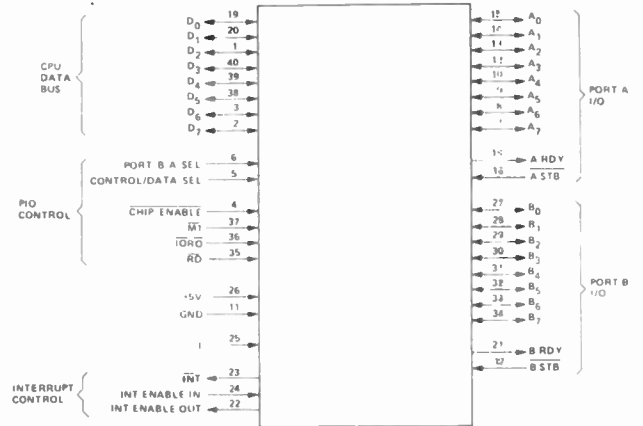
external address decoder to provide the appropriate chip select signals. Another advantage of the Z80 is that it can provide all of the refresh control for dynamic memories up to 64K bytes directly, and will interface directly with most 18-pin and 22-pin 4K dynamic RAM's with virtually no additional external logic (16-pin types require only an external address multiplexer). The Z80 requires only a single 5V supply as do all its support chips described below and a single-phase TTL clock operating from a 4MHz crystal. This amazing MPU outperforms any other microcomputer in 4, 8 or 16-bit applications.

Order

QW00A (Z80A-CPU) £2.98

Z80-PIO Parallel Interface Controller

This IC provides a universal means of interfacing parallel data to a microprocessor.

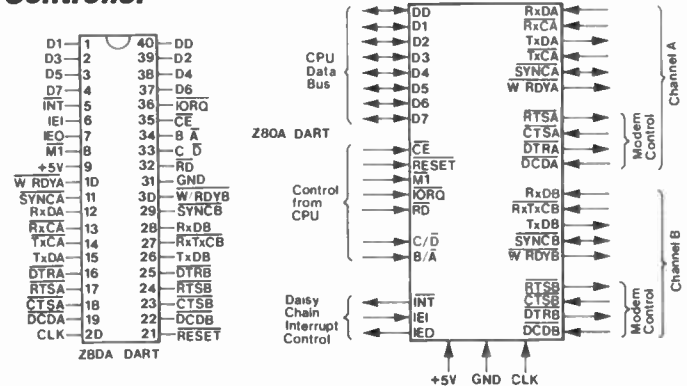


It can interface the 8-bit data bus of the MPU to two 8-bit peripheral buses e.g. keyboard, VDU, printer etc. Data are able to flow in either direction to and from the peripheral buses under the control of the microprocessor. Features include interrupt driven "handshake" for fast response; byte output, byte input, byte bidirectional bus (port 'A' only), and bit modes of operation; programmable interrupts on peripheral status conditions; daisy chain priority interrupt logic included to provide automatic interrupt vectoring without external logic; eight outputs capable of driving Darlington transistors (-1.5mA at 1.5V); and all inputs and outputs fully TTL compatible.

Order

QW03D (Z80A-PIO) £3.63

Z80A DART Dual Serial Interface Controller



This dual UART contains two independent full-duplex channels with separate control and status lines for modems or other devices. Data rates up to 800k bits per second are possible with a 4MHz clock. The device supports all common asynchronous protocols, byte or bit-oriented and performs all the functions traditionally done by UART's, USART's and synchronous communication controllers combined, plus additional functions traditionally performed by the CPU. Moreover, it does this on two fully-independent channels, with an exceptionally sophisticated interrupt structure that allows very fast transfers. Full interfacing is provided for CPU or DMA control. In addition to data communication, the circuit can handle virtually all types of serial I/O with fast (or slow) peripheral devices. While designed primarily as a member of the Z80 family, its versatility makes it well suited to many other CPU's. The Z80 DART is an n-channel silicon-gate depletion-load device packaged in a 40-pin plastic package. It uses a single +5V power supply and the standard Z80 family single-phase clock.

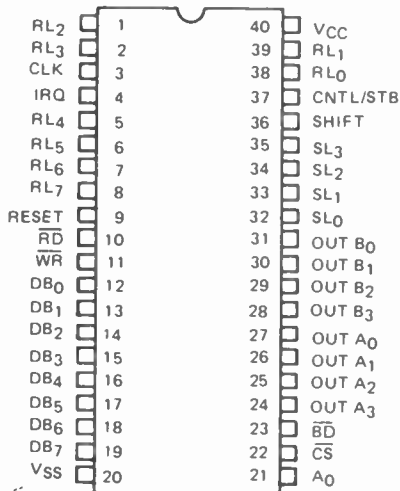
Order

UF35Q (Z80A-DART) £8.95

8279 Keyboard/Display Interface

This IC is a general purpose keyboard and display I/O interface device for use with microprocessors. The IC will scan a 64-contact key matrix and perform 2-key lockout and N-key rollover. Keyboard entries are debounced and strobed in an 8-character FIFO and if more than 8 characters are entered, overrun status is set. Key entries set the interrupt output line to the MPU. The display part of the IC provides a scanned interface for LED and other types of displays. Numeric and alphanumeric displays and simple indicators may be used.

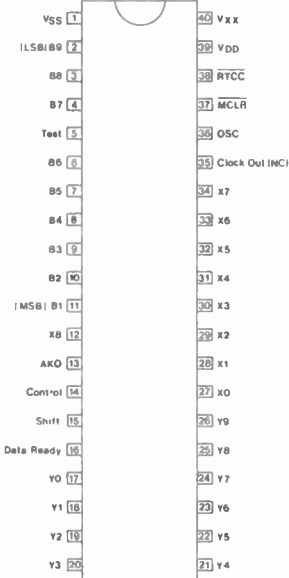
The IC has a 16x8 display RAM which can be organised into two 16x4. The RAM can be loaded or interrogated by the MPU. Right entry calculator and left entry typewriter display formats are possible. Both read and write of the RAM can be done with auto-increment of the RAM address.



Order

YH51F (8279) £7.95

KB3600-ASCII



A keyboard encoder designed to read a 90-key keyboard organised in a 9 x 10 matrix and output a 9-bit code when a key-closure is detected. Up to 360 different outputs are possible allowing a 4-level keyboard to be built. The device features N-key rollover, output TTL or MOS compatible, output data buffer register, auto repeat, any key down signal, auto key debounce and standard ASCII outputs. Connect an 18k Ω resistor between pins 36 and 39 and a 47pF capacitor between pins 1 and 36. Connect pin 38 to pin 1 and hold pin 37 low for at least 1ms. Pin 35 should not be connected and pin 5 should be connected to pin 1. Pins 39 and 40 should be connected to 5V and pin 1 to 0V. The data is output on pins B1 to B9. Pins X0 to X8 are the nine scan rows of the keyboard and Y0 to Y9 are the ten scan columns. The shift key is connected to pin 14 for the third level; and if both are active together, a fourth level is generated. Pin 13 goes high when any key is down and pin 16 pulses high whenever a new set of data has been latched into the output. In addition, if the same key is held depressed for over 1/2 a second, pin 16 pulses high every 1/10 of a second for auto-repeat.

Specification

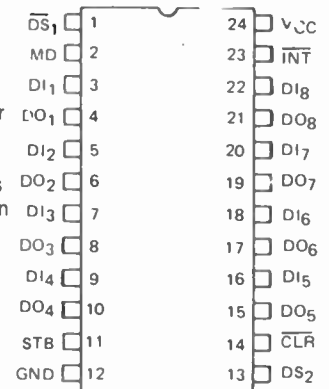
Supply voltage (V _{DD})	4.5V to 7V
Output supply voltage (V _{xx})	4.5V to 10V
Supply current (I _{DD})	30mA
Output supply current (I _{xx})	1mA

Order

RA60Q (KB3600) £6.95

DRIVER & BUFFER IC's 8212 8-Bit Input/Output Port

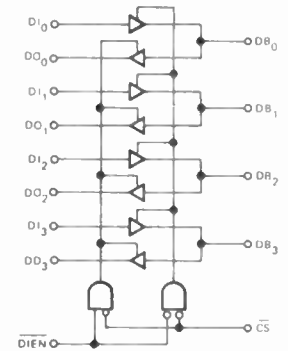
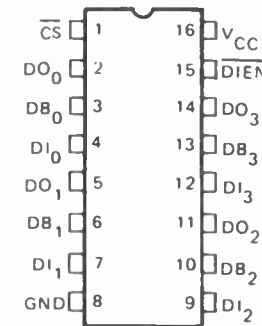
A fully parallel 8-bit data register and buffer with 3-state outputs. The device has an 8-bit latch and output buffers with control and device selection logic. Also included is a service request flip-flop for the generation and control of interrupts to the microprocessor. Input load current: 0.25mA, output sink current: 15mA.



Order

YH44X (8212) £2.50

8216 Bus Driver

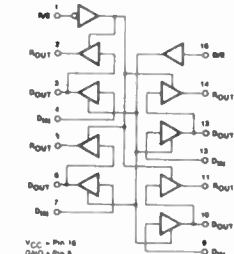
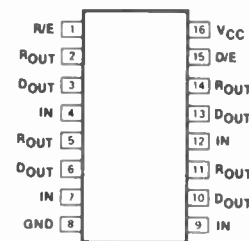


A 4-bit bidirectional bus driver/receiver that is LS TTL compatible. The DO outputs provide a high 3.65V for driving MOS while the DB outputs provide a high 50mA for high capacitance terminated bus structures. The buffers are non-inverting and have 3-state outputs.

Order

YH45Y (8216) £1.72

8T28 4-Bit Bidirectional Bus Transceiver



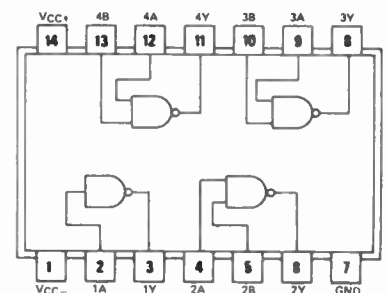
This IC consists of 4 pairs of 3-state logic elements configured as quad bus drivers/receivers with separate buffered receiver enable and driver enable lines. Driver output current >50mA, receiver output current >30mA, high level input current driver and receiver <25 μ A.

Order

YH34M (8T28) £2.75

MC1488 Quad RS232 Line Driver

A quad line driver IC which converts standard TTL levels through one stage of inversion to output levels which meet EIA standard RS232C and CCITT standard V24. The package contains three NAND functions and one inverter.



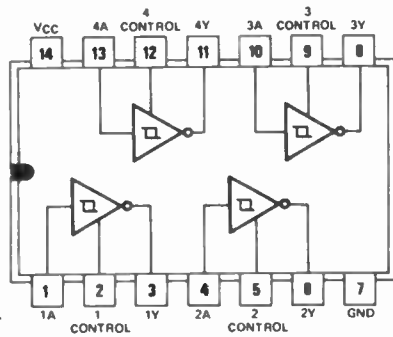
Characteristics

Supply voltage (max):	+15V, -15V
Input voltage (min/max):	-15V, +7V
Output voltage (max):	±15V
Power dissipation (max):	800mW
Input current ($V_{in} = 0V$):	-1mA
($V_{in} = +5V$):	5mA
Output voltage ($V_{in} = 0.8V$, $R_L = 3k$, $V_S = ±9V$):	+7V
($V_S = ±13.2V$):	+10.5V
($V_{in} = 1.9V$, $R_L = 3k$, $V_S = ±9V$):	-6.8V
($V_S = ±13.2V$):	-10.5V
Short-circuit current ($V_{out} = 0V$, $V_{in} = 0.8V$):	-10mA
($V_{in} = 1.9V$):	10mA
Output resistance:	300Ω

Order

YH89W (MC1488N) **£1.15**

MC1489 Quad RS232 Line Receiver



A quad line receiver IC designed to interface data terminal equipment with data communications equipment. The devices meet the EIA standard RS232C specification.

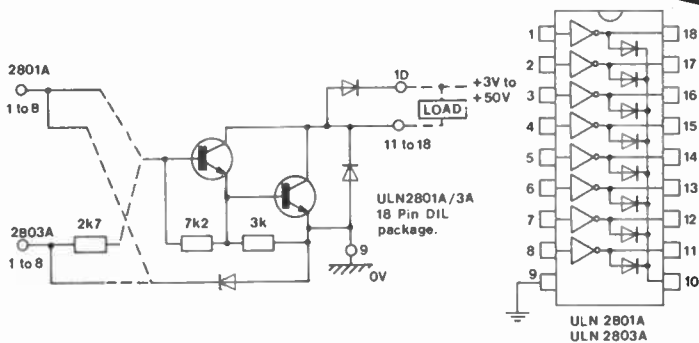
Characteristics (typical)

Supply voltage (max):	10V (5V typical)
Input voltage (max):	±30V
Output load current (max):	20mA
Power dissipation (max):	800mW
Input high threshold voltage ($V_{out} < 0.45V$, $I_{out} = 10mA$):	1V min, 1.5V max.
Input low threshold voltage ($V_{out} < 2.5V$, $I_{out} = -0.5mA$):	0.75V min, 1.25V max.
Input current ($V_{in} = +25V$):	+5.6mA
($V_{in} = -25V$):	-5.6mA
($V_{in} = +3V$):	+0.53mA
($V_{in} = -3V$):	-0.53mA
Output high voltage ($V_{in} = 0.75V$, $I_{out} = -0.5mA$):	3.8V
($V_{in} = Open$, $I_{out} = -0.5mA$):	3.8V
Output low voltage ($V_{in} = 3V$, $I_{out} = 10mA$):	0.33V
Output short-circuit current ($V_{in} = 0.75V$):	3mA
Supply current ($V_{in} = 5V$):	20mA
Power dissipation ($V_{in} = 5V$):	100mW

Order

YH90X (MC1489N) **£1.15**

ULN2801A/3A Octal Darlington Driver Arrays



Eight separate darlington amplifiers in one 18-pin package, each capable of supplying 500mA at up to 50V. Outputs may be paralleled to give up to 4A at 50V (at 23% duty cycle and 25°C). Internal diodes are provided for inductive loads. Type 2801 may be used with standard bipolar digital logic or CMOS, while type 2803 has a 2k7 base resistor to enable direct connection to TTL and 5V CMOS.

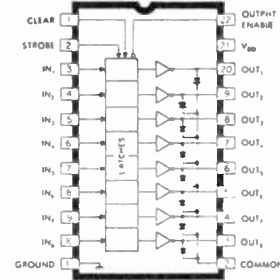
Order

QY78K (ULN2801A) **£1.95**
QY79L (ULN2803A) **£2.15**

UCN5801A Latching Octal Driver



A high current, high voltage driver IC comprising eight CMOS data latches, a bipolar darlington transistor driver for each latch, and CMOS control circuitry. Inputs are CMOS, PMOS and NMOS compatible, and a pull-up resistor is required for TTL. Input speeds up to 5MHz are possible with 5V supply, and much higher rates with 12V supply. Outputs are open collector with integral diodes for inductive loads, and are capable of sinking 500mA at 50V at 25°C. If more than two maximum loads are connected at once, then the duty cycle must be reduced (to 23% for all eight loads at 25°C). Outputs can be paralleled for higher currents.



Specifications:

Supply voltage (V_{DD}):	5V to 12V
Input voltage high (min):	$V_{DD} - 1.5V$ (V_{DD} max.)
Input voltage low (max):	1V (-0.3V min.)
Supply current:	5-6mA @ $V_{DD} = 5V$; 8mA @ $V_{DD} = 12V$

Data present at an input is transferred to its latch when pin 2 is high. A high on pin 1 sets all latches to output off regardless. A high on pin 22 sets all outputs off regardless. When pin 22 is low, the output depends on the state of its latch.

Order

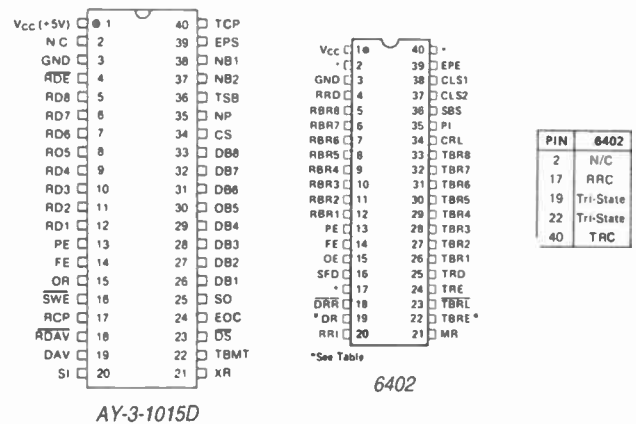
QY77J (UCN5801A) **£7.95**

AY-3-1015D Universal Asynchronous Receiver/Transmitter

This UART accepts binary characters from either a terminal device or a computer and receives/transmits this character with appended control and error correcting bits. All characters contain a start bit, 5 to 8 data bits one or two stop bits and either odd, even or no parity. The baud rate, bits per word, parity mode and the number of stop bits are externally selectable. Speeds up to 40k baud (kbps) are possible with 46% distortion immunity. Full duplex operation may be carried out at differing baud rates. The IC is fully double buffered to eliminate the need for system synchronisation and the 3-state outputs are TTL compatible. Single 5V operation.

Order

WQ18U (AY-3-1015D) **£4.75**



6402 Universal Asynchronous Receiver/Transmitter

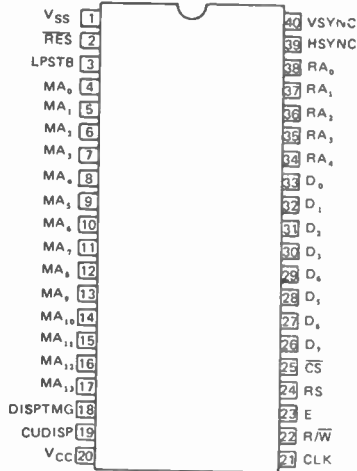
This industry standard UART will interface computers or micro-processors to asynchronous serial data channels. The receiver converts serial start, data parity and stop bits to parallel data, verifying proper code transmission, parity and stop bits. The transmitter converts parallel data into serial form and automatically adds start, parity and stop bits. The data word length can be 5, 6, 7 or 8-bits. Parity may be odd or even. Parity checking and generation can be inhibited. The stop bits may be one or two, or one and a half if transmitting five bit code. This IC is sometimes supplied coded CDP1854ACE. These two parts are identical.

Order

QQ04E (6402) **£5.95**

MC6845 (6545) CRT Controller

A cathode ray tube controller with alpha-numeric, semi-graphic and full graphic capability. Fully programmable via the microprocessor data bus the CRTIC can generate timing for almost any alphanumeric screen density e.g. 80x24, 72x64, 132x20 etc. Other features include single +5V supply, hardware scroll by page, line or character, cursor register and compare circuit allows fully programmable cursor, light pen register, 50Hz operation, interlaced or non-interlaced scan, row or column or straight binary addressing for refresh RAM that may be configured as part of the microprocessor memory field or independently slaved to the CRTIC and there is an internal 8-bit status register.



Order

QQ03D (MC6845) £6.95

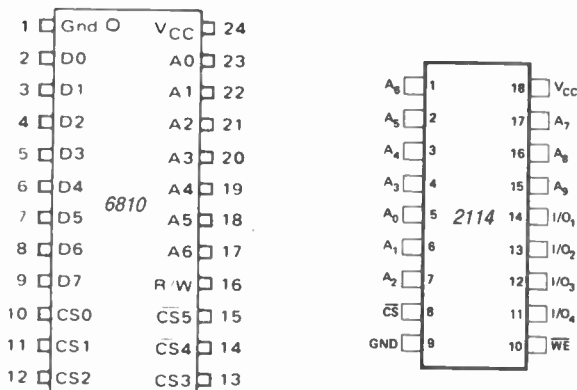
MEMORY IC's

MC6810AP 1K Static Random Access Memory

A 1024-bit static random access read/write memory (RAM) organised as 128 x 8-bit words. The IC operates from a single 5V supply at typically 40mA. Access time is < 450ns and thus this chip is suitable for use with all our microprocessors. The inputs/outputs are 3-state and TTL compatible. Complete address decoding is performed on-chip and there are six chip-enable inputs (four are active-low and two are active-high) for absolute ease of memory expansion.

Order

WQ45Y (MC6810AP 450ns) £2.95



2114 4K Static Random Access Memory

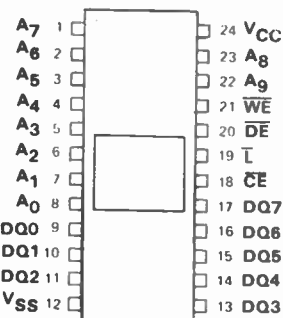
A 4096-bit static random access read/write memory (RAM) organised in 1024 x 4-bit words. The IC operates from a single 5V supply at typically 80mA. Access time is < 450ns and thus the chip is suitable for use with all our microprocessors. The input/outputs are 3-state and TTL compatible and there is chip enable input for memory expansion.

Order

QW12N (2114 450ns) £2.95

4118 8K Static Random Access Memory

An 8192-bit static random access read/write memory (RAM) organised as 1024 8-bit words. The IC operates from a single 5V supply at typically 80mA. Access time is < 250ns. The inputs/outputs are 3-state and TTL compatible.



Order

QQ05F (4118 250ns) £5.95

6116-3 (446-3) 16K CMOS Static RAM

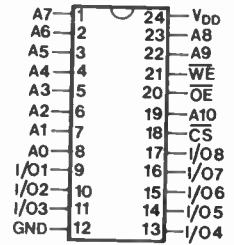
A 2048 x 8-bit static RAM built in CMOS. Pin compatible with 16K EPROM'S the device offers access times of 150ns and data retention at voltages down to 2V with standby currents as small as 10nA at 3V. The chip operates from a single +5V supply.

Characteristics (typical)

Supply voltage 5V
Supply current 5mA static
25mA @ 150ns cycle
Data retention voltage 2V min
current 10nA (10µA max)
Access time 150ns max

Order

UF33L (6116 (446) 150ns) £2.30



6264 64K CMOS Static RAM

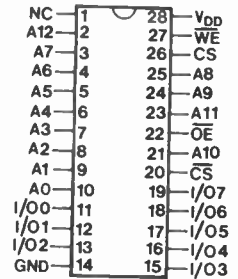
An 8192 x 8-bit static RAM built in CMOS. Pin compatible with 64K EPROM's, the device offers access times of 150ns and data retention at voltages down to 2V with standby currents as small as 20µA at 3V. The chip operates from a single +5V supply.

Characteristics (typical)

Supply voltage 5V
Supply current 110mA max
Data retention voltage 2V
current 20µA
Access time 150ns max

Order

UF34M ((6264-150ns)) £6.50



65256-15 256K Pseudo-Static RAM

A 262,144-bit pseudo-static RAM organised as 8 bits by 32768 words. The chip has on-board refresh control for ease of use and various operating modes are possible. Access time is 150ns.

Specification (typical at 25°C)

Supply voltage: 5V
Supply current: 35mA
Standby supply current: 0.4mA
Supply current (self refresh only): 0.6mA
Random read or write cycle: 235ns
Read modify write cycle: 300ns
Chip enable access time: 150ns
Address access time: 75ns
Output enable access time: 60ns
Refresh period: 4ms (256 cycle)

Order

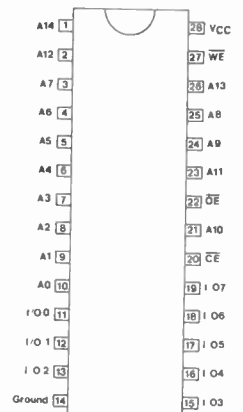
RA92A (HM65256AP-15) £16.95

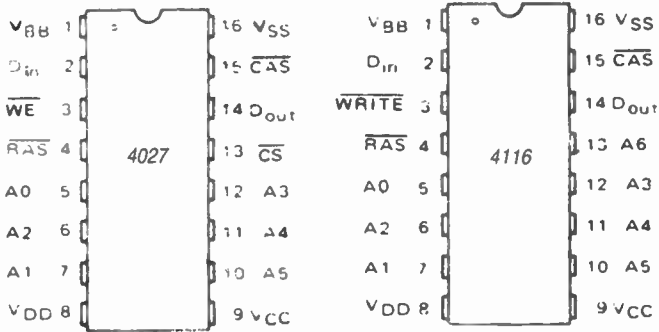
4027 4K Dynamic Random Access Memory

A 4096-bit dynamic random access read/write memory (RAM) organised as 4096 x 1-bit words. The IC operates from three voltage supplies: V_{DD} = +12V (at 35mA max), V_{CC} = +5V (the current depends on output load when chip is enabled and is virtually nil at other times) and V_{BB} = -5V (at 150µA max). (V_{SS} = 0V). When chip is not selected V_{DD} current falls to 2mA max. Access time is < 250ns, and a refresh cycle is required every 2ms, thus this chip is directly suitable for use with the Z80 and indirectly with our other microprocessors. The output is 3-state to enable memory expansion. Complete address decoding is performed on-chip and there are on-chip latches for address, chip-select and data in. The IC has page-mode capability.

Order

WQ42V (MCM4027 250ns) £2.45





4116 16K Dynamic Random Access Memory

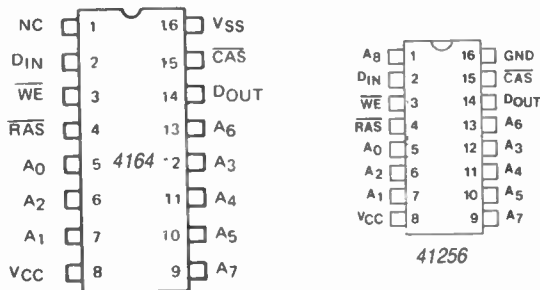
A 16,384-bit random access read/write memory (RAM) organised as 16,384 x 1-bit words. The IC operates from three voltage supplies: $V_{DD} = +12V$ (at 45mA max) $V_{CC} = +5V$ (the current depends on output load and is virtually nil when chip is not selected) and $V_{BB} = -5V$ (at 200 μ A max) ($V_{SS} = 0V$). When chip is not selected V_{DD} current falls to 2mA max. Access time is <250ns, and a refresh cycle is required every 2ms, thus the chip is directly suitable for use with the Z80 and indirectly with our other microprocessors. The output is 3-state to enable memory expansion. Complete address decoding is performed on-chip and there are on-chip latches for address and data-in.

Order
QW93B (4116 250ns) £1.15

4164 64K Dynamic Random Access Memory

A 65,536-bit dynamic random access read/write memory (RAM) organised as 65,536 x 1-bit words. The IC operates from a single +5V supply at less than 45mA. When chip is not selected, current falls to less than 5mA. Access time is <250ns and the output is 3-state.

Order
QQ06G (4164 200ns) £2.30



NEW

41256 256K Dynamic Random Access Memory

A 262,144 x 1 bit D-RAM having an access time of 150ns. Operation is from a single +5V supply at less than 70mA with standby current of less than 5mA. The output is 3-state TTL compatible.

Order
QY74R (41256 - 150ns) £6.95

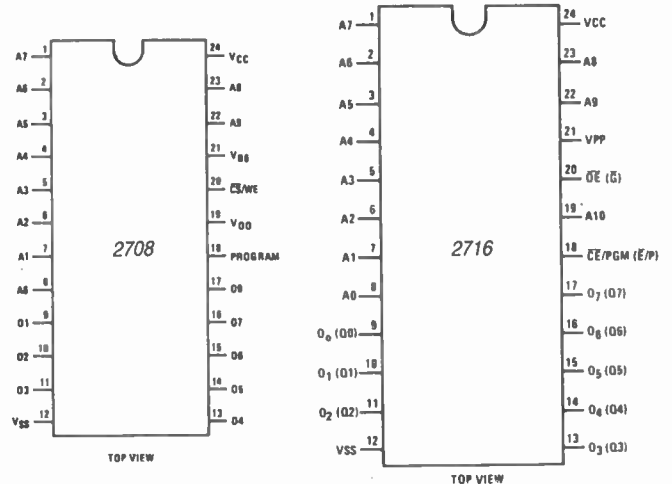
2708 8K Erasable, Programmable Read Only Memory

An 8192-bit electrically programmable and ultra-violet erasable read only memory (EPROM) organised as 1024 x 8-bit words. The pin functions of the IC vary according to whether it is in the programming mode or read mode.

Pin No.	Read Mode	Pin Function	Programming Mode
9	Data Output 0		Data Input 0
10	Data Output 1		Data Input 1
11	Data Output 2		Data Input 2
12	0V		0V
13	Data Output 3		Data Input 3
14	Data Output 4		Data Input 4
15	Data Output 5		Data Input 5
16	Data Output 6		Data Input 6
17	Data Output 7		Data Input 7
18	0V		+26V Program Pulse
19	+12V		+12V
20	Chip select (low to select)		+12V
21	-5V		-5V
24	+5V		+5V

Access time is 450ns and the IC is fully static. The outputs are 3-state and inputs are TTL compatible. Complete address decoding is performed on-chip and there is a chip-enable input for memory expansion. A transparent lid on the IC allows the user to erase the bit pattern by exposing the chip to ultraviolet light at 253.7nm (2537 \AA) with an incident energy of 15W-seconds/cm². Thus with a 5.5mW/cm² UV tube and the device positioned one inch from it and with no intervening filter glass the IC will be completely erased in about 50 minutes.

Order
QW13P (2708 450ns) £7.95



2716 16K Erasable, Programmable Read Only Memory

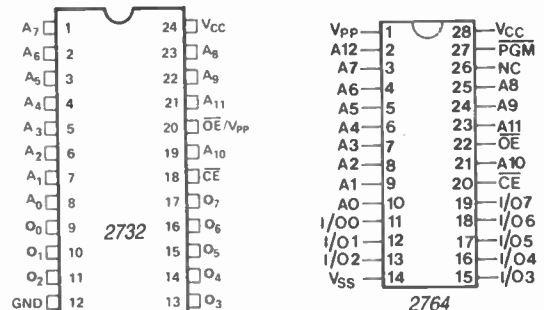
A 16,384-bit electrically programmable and ultra-violet erasable read only memory (EPROM) organised as 2048 x 8-bit words. The IC operates on a single +5V supply in read mode. Access time is 350ns and the IC is fully static. The outputs are 3-state and inputs and outputs are TTL compatible. Programming is achieved by applying +25V to pin 21 and with the address and data lines stable apply a +5V pulse to pin 18. Note that only one pulse is required for each location. A transparent lid on the IC allows the user to erase the bit pattern by exposing the chip to ultraviolet light at 253.7nm with an incident energy of 15W-seconds/cm². Thus with a 12mW/cm² UV tube and the device positioned one inch from it and with no intervening filter or glass, the IC will be completely erased in about 20 minutes.

Order
QQ07H (2716 350ns) £3.45

2732 32K Erasable, Programmable Read Only Memory

A 32,768-bit electronically programmable and ultra-violet erasable read only memory (EPROM) organised as 4096 x 8-bit words. The IC operates on a single +5V supply in read mode. Access time is 350ns and the IC is fully static. The outputs are 3-state and inputs and outputs are TTL compatible. Programming is achieved by applying +25V to pin 20 and with the address and data lines stable apply a +5V pulse to pin 18. Note that only one pulse is required for each location. A transparent lid on the IC allows the user to erase the bit pattern by exposing the chip to ultraviolet light at 253.7nm with an incident energy of 15W-seconds/cm². Thus with a 12mW/cm² UV tube and the device positioned one inch from it and with no intervening filter or glass, the IC will be completely erased in about 20 minutes.

Order
QQ08J (2732 350ns) £3.95



2764 64K Erasable, Programmable Read Only Memory

A 65,536-bit electronically programmable and ultra-violet erasable read only memory (EPROM) organised as 8192 x 8-bit words. The IC operates on a single +5V supply in read mode. Access time is 350ns and the IC is fully static. The outputs are 3-state and inputs and outputs are TTL compatible. Programming is achieved by applying +25V to pin 22 and with the address and data lines stable apply a +5V pulse to pin 20. Note that only one pulse is required for each location. A transparent lid on the IC allows the user to erase the bit pattern by exposing the chip to ultra violet light at 253.7nm with an incident energy of 15W-seconds/cm². Thus with a 12mW/cm² UV tube and the device positioned one inch from it and with no intervening filter of glass, the IC will be completely erased in about 20 minutes. See previous page for pin-out diagram.

Order

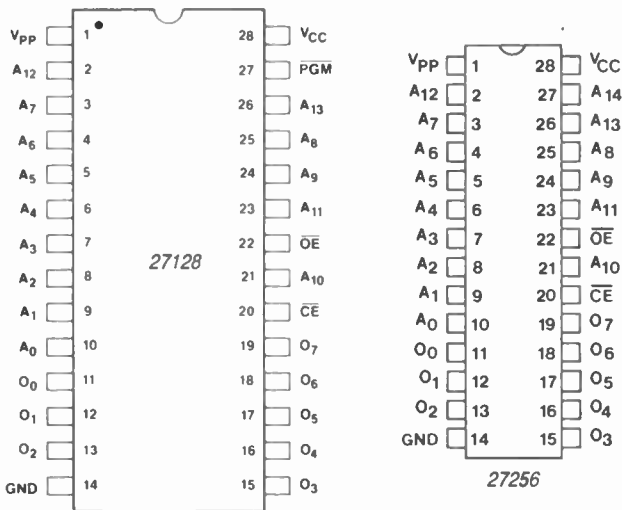
QQ09K (2764 350ns) £5.95

27128 128K Erasable, Programmable Read Only Memory

A 131,072-bit electrically programmable and ultra-violet erasable read only memory (EPROM) organised as 16,384 x 8-bit words. The IC operates on a single +5V supply in read mode. Access time is 450ns and the IC is fully static. The outputs are 3-state and inputs and outputs are TTL compatible. Programming is achieved by applying +21V to pin 1 and with the address and data lines stable apply a +5V pulse to pin 27. Note that pin 22 must also be high. A transparent lid on the IC allows the user to erase the bit pattern by exposing the chip to ultra-violet light at 253.7nm with an incident energy of 15W-seconds/cm². Thus with a 12mW/cm² UV tube and the device positioned one inch from it and with no intervening filter or glass, the IC will be completely erased in about 20 minutes.

Order

YH88V (27128) £7.95



27256 256K Erasable, Programmable Read Only Memory

NEW

A 32,768 x 8 bit ultra-violet erasable PROM, featuring 250ns access time and high-performance programming at only 12.5V. Inputs and outputs are TTL compatible in READ and program modes. For READ operation, V_{CC} and V_{PP} must be +5V ±5%. Supply current is 105mA max. (45mA typical), standby 40mA max. For programming mode, V_{CC} must be taken to 6V ±0.25V and V_{PP} to 12.5V ±0.3V (NOT 21V). With address and data stable (2μs), a 1ms ±5% active low pulse is applied to pin 20. An average program time is 1½ minutes per chip. The erasure procedure and timings are the same as for the 128K EPROM.

Order

QY75S (27256 - 250ns) £14.95

SOFTY EPROM PROGRAMMER

A microprocessor based EPROM programmer that can simulate ROM or EPROM whilst programming, then when the program is correct, used to blow the EPROM. Softy is capable of forming a complete product development system when connected via a serial (RS232) or parallel link to any small computer capable of supporting an assembler. Softy is already being used by the GPO, BBC, ATV, ITT, Ministry of Defence, Pye, Plessey, Unilever, Courtaulds, British Nuclear Fuels, British Aerospace, British Museum, Science Museum and many other research organisations schools and universities. The unit can be connected directly to a TV set or monitor and produces a map of the memory contents with the data contents

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★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

World Radio History



of each address location shown as a pair of hexadecimal digits.

Supplied ready-built and tested with its own power supply and comprehensive instructions.

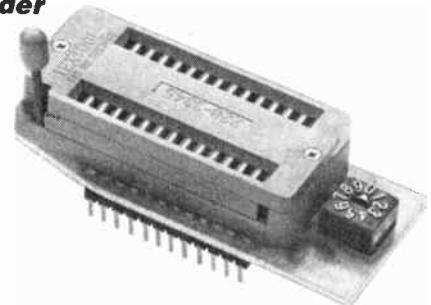
Features

- ★ Replaces monitor ROM and circuit needed to test programs on most microprocessors.
- ★ Hexadecimal data may be written to any location.
- ★ Contents of all memory addresses visible on screen.
- ★ Connects to system under development as ROM/RAM.
- ★ Useful as control computer in its own right. User programmable to perform complex control functions.
- ★ Ideal training aid. Execution by internal microprocessor will halt at set breakpoint (which may be substituted for any program instruction) and contents of internal registers will be displayed.
- ★ Crystal controlled one-microsecond microcycle for timing and delay functions. INS 8060 has on-chip programmable timer.
- ★ Two eight-bit I/O ports. Port A may be used in strobed or tri-state modes and will generate interrupt.
- ★ Universal assembler functions: block shifts, hexadecimal addition and subtraction, insertion or deletion of instructions, matching of specific bytes etc.
- ★ International standard card-edge. Similar prototyping cards widely available.
- ★ Fast cassette interface — over 2000 baud equivalent — for program storage (TRANSWIFT).
- ★ On-board EPROM programmer. Fastest possible device permits reading from same socket and verifies program.
- ★ Copies software — any memory device wired to address/data lines can be copied on screen, tape or EPROM.
- ★ Can reprogram itself to perform special operations by substituting firmware ROM.

Order

XY84F (Softy 2 System) £224.25

Softy 2 Expander



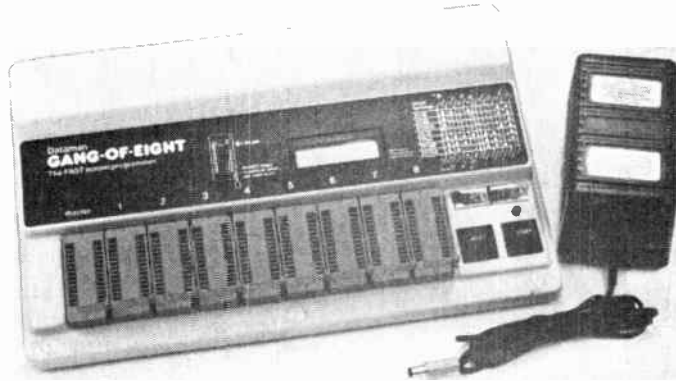
An add-on expander which is designed to accommodate the larger 28-pin EPROM's, using a 28-pin ZIF (Zero Insertion Force) socket, with a rotary selector switch allowing EPROM loading in increments of 2K-bytes at a time. There are two modes of use: READ, which allows the the user to examine the contents of the chip currently plugged into the ZIF socket, and store it in Softy's 2K of RAM; and BURN which writes the current contents of the RAM into the blank EPROM segment as selected by the rotary switch. This allows Softy to program 2732A, 2764 or 27128 type EPROM's, although some adjustment of the programming pulse voltage may be required. Instructions are supplied.

Order

FK48C (Softy 2 Adaptor) £29.95

GANG-OF-EIGHT EPROM PROGRAMMER

NEW



Gang-of-Eight

An EPROM duplicator that will copy into any number from 1 to 8 of the popular 24 and 28-pin EPROM IC's, data from one master IC of the same type. Gang-of-Eight has its own short program contained in ROM, which itself is tested on power-up and RESET. An 8-digit, 7-segment LCD display is used to show the operator which EPROM type is being used, whether normal or fast programming speed has been chosen, and the programming voltage.

These can be decided by the operator via eight presettable switches, and the copying program has many built-in safety features, for example:-

1. The programming voltage (V_{PP}) is selected and applied by the switch settings, rather than by software to minimise risk to EPROMS. Three program voltages are selectable: 21V, 25V and a user adjustable level that can be set from 0 to 25V with a preset accessible from beneath Gang-of-Eight.

2. On commencement of programming all the IC's are first checked for incorrect insertion or wrong type, and the procedure halts with an error message. Power to the EPROMS is continuously monitored on interrupt - if any anomaly occurs, the system shuts down. Internal tests on EPROMS before and after power-up will trap most operator-induced errors such as mis-insertion, before any harm is done. Gang-of-Eight runs self-tests on its own program ROM to ensure correct operation before running.

3. The eight switches are listed in a cross reference table printed on the front panel, which shows the settings for all the common EPROMS, listed in the left column. Also the programming voltage and programming speed can be chosen. Any setting which gives a static display is valid, the EPROM type number, programming speed and programming voltage will be shown on the display. If the settings are unusual (not as front panel table) a 'walking' message is displayed - 'TYPE-ALGORITHM-VOLTAGE', which may indicate an incorrect setting - however, Gang-of-Eight will permit the operator to program with 'suspicious' algorithms if the operator chooses to override the warning. Some settings are definitely wrong and so the message 'INVALID' is displayed.

4. Internal logic supply levels are derived from a switching regulator for high efficiency and good tolerance of supply transients, and includes an over-voltage 'crowbar' circuit as a second defence against supply irregularities.

A choice of two types of programming algorithm are supported. The 'Normal' setting applies the full 50ms programming pulse for each byte, but the 'Fast' setting cuts time by using pulses of 1ms and reading back the byte - this is repeated until the byte does verify correctly. Then an over-program pulse equal to four times the sum of all previous pulses is applied - a total period of 50ms will not be exceeded - and the data tested again against the Master. If that address has been satisfactorily programmed then the program moves on to the next address and data and the process repeated. Each location only takes as long as necessary to be programmed. If any address byte will not respond then Gang-of-eight will display 'VERIFY' followed by the address and ZIF socket number.

The entire EPROM is tested again on completion. When a batch of devices are being programmed the address and data are supplied in parallel, but the programming process waits for the last device to verify - if the device fails, it is ignored for the remainder of the process. The EPROMS are run at supply and logic levels of +6V to ensure that the devices will operate at highest levels of V_{cc} to be met in use. A red LED signal lamp is lit during the programming process, indicating that nothing must be touched until the sequence is complete. A RESET button returns Gang-of-Eight to the starting condition. The START button begins the programming process.

Gang-of-Eight Plus

Gang-of-Eight Plus will do all of the above and includes a facility for downloading from computer using RS232. The transmission rate is set at 1200 baud, and the format is officially 8 data bits, 2 stop bits with no parity, although in actual fact only the first 7 bits are used. One byte is received at a time using CTS or DSR handshaking, and then written into the EPROMS. This will only work so long as the Master socket is vacant. Gang-of-Eight primarily recognises INTELHEX for the transmission format, but will also accept TEKHEX, straight 8-bit HEX, Motorola S, or ASCII organised into character representation of hexadecimal of 0 to 9 and A to F, and presented most significant nibble first. Because Gang-of-Eight programs data received into the EPROMS immediately, the hex files must be suitably trimmed first.

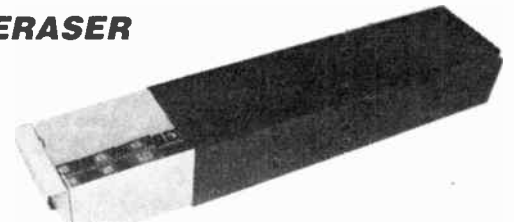
After programming the EPROMS can be verified against the data of a second transmission. Alternatively, previously transmitted data can be verified against a master EPROM inserted into the Master socket.

Note that both the G8 and the G8+ are identical in appearance - both have the RS232 connections but only the serial interface is implemented in the G8+. Gang-of-Eight is supplied with a remote PSU which plugs into the mains, and connects to the programmer via a lead terminated in a DC power plug. Dimensions: Width 296mm (11 $\frac{1}{2}$ in.). Depth 192mm (7 $\frac{1}{2}$ in.). Height 50mm (2in.).

Order

YM34M (Gang-of-Eight)	£454.25
YM35Q (Gang-of-Eight Plus)	£511.75

EPROM ERASER



A low-cost bench-top ultra-violet irradiator using a special cold tube from which 95% of the radiated energy lies in a narrow band centred on 2537 Angstroms (253.7nm). All standard pitch EPROM's can be erased, up to 40 at a time without significant temperature rise or ozone emission.

Specification

Wavelength:	2537Å (253.7nm)
Intensity:	0.85mW/cm ² at 3mm from tube
Erase time:	20 minutes
Capacity:	40 devices
Power rating:	200 to 250V, 50 to 60Hz, 6W
Overall size:	320 x 87 x 80mm.
Weight:	500gm

Supplied with 1m of mains cable and full instructions and safety precautions.

WARNING Read the safety instructions supplied with the unit carefully before use.

Order

XY83E (EPROM Eraser)	£52.95
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Replacement Ultra-Violet Bulb

A spare ultra-violet bulb is available for the EPROM Eraser.

Order

FJ56L (Spare UV Bulb Epr Er)	£14.95
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FREQUENCY GENERATOR IC's 8038 Waveform Generator

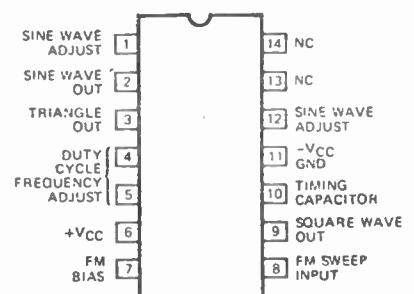
A 14-pin DIL IC capable of producing sine, square, triangular, sawtooth and pulse waveforms of high accuracy with the addition of a very few components. The frequency may be selected to be from 0.001Hz (i.e. 1 cycle per 16 minutes) to 1MHz, with high linearity (0.1%), low distortion (1%) and low frequency drift (<50ppm/°C). Frequency modulation and sweeping can be accomplished with an external voltage and the frequency can be programmed digitally by resistors or capacitors. Sweep range can be up to 40:1 or 1000:1 with a little less quality.

Application Circuit

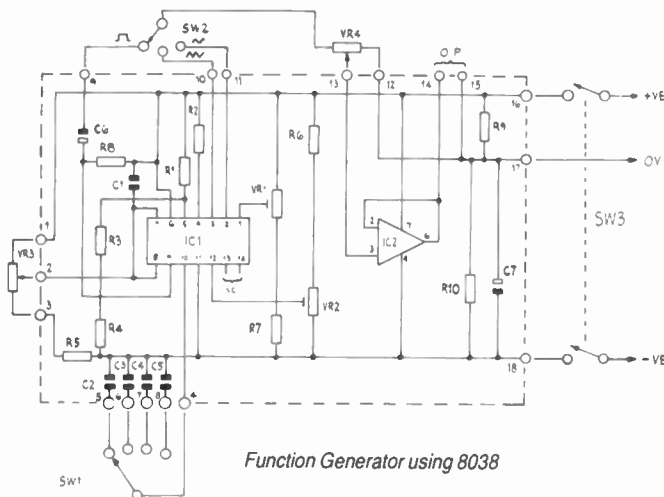
The circuit shows a sine, triangle and square wave generator. SW1 is the range switch, SW2 sets the waveshape, VR4 sets the output level and VR3 is the frequency control. VR1 and VR2 should be adjusted to give minimum distortion of sine wave.

Specification

Supply voltage:	5-0-5V to 10-0-10V (e.g. 2 x PP3 batteries)
Output impedance:	600Ω
Output levels max peak-to-peak ($V_S = 7.5-0-7.5V$)	
sinewave:	3V
triangle:	5V
square:	12V
Distortion sinewave	
<10kHz	<1%
10kHz to 100kHz:	<4%
100kHz to 200kHz:	<7%
Linearity triangle	
<40kHz	<0.1%
40kHz to 100kHz	<1%
100kHz to 200kHz	<8%



8038 Function Generator Continued



Function Generator using 8038

Square Wave

<100kHz	Rise time	Fall time
100kHz to 200kHz	2µs	2µs
	1µs	1µs

Frequency range

Range 1:	10Hz to 400Hz
Range 2:	100Hz to 4kHz
Range 3:	1kHz to 40kHz
Range 4:	6.25kHz to 200kHz

Parts List

R1,2,9,10	Min Res 2k2	C1	Poly Layer 1µF (WW53H)
R3	Min Res 10M	C2	Polyester 0.22µF (BX78K)
R4	Min Res 4M7	C3	Polyester 0.022µF (BX72P)
R5	Min Res 22k	C4	Polystyrene 2200pF (BX37S)
R6,7	Min Res 10k	C5	Polystyrene 220pF (BX30H)
R8	Min Res 2k7	C6	PC Elect 47µF 25V (FF08J)
C7	PC Elect 100µF 25V (FF11M)		
VR1,2	Hor Sub-Min Preset 100k (WR61R)		
VR3,4	Pot Lin 10k (FW02C)		
IC1	8038CCPD (YH38R)		
IC2	LF351 (WQ30H)	1	8038 PCB (YQ65V)
SW1	Rotary SW4B (FF75S)	1	DIL Socket 8-pin (BL17T)
SW2	Rotary SW3B (FF76H)	1	DIL Socket 14-pin (BL18U)
SW3	Sub-Min Toggle E (FH04E)	18	Pins 2141 (FL21X)

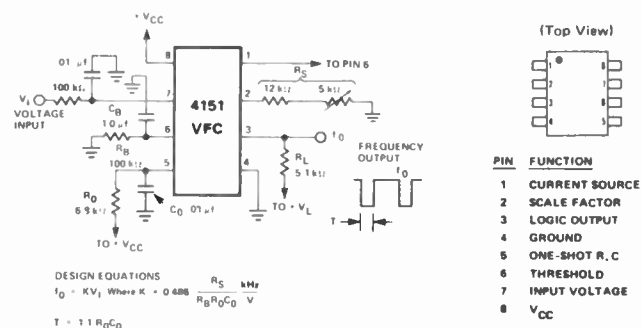
A pcb is available for the circuit shown.

Order

YQ65V (8038 PCB)	98p
YH38R (8038 CCPD)	£5.95

D/A & A/D CONVERTER IC'S

4151 Voltage to Frequency Converter



PIN	FUNCTION
1	CURRENT SOURCE
2	SCALE FACTOR
3	LOGIC OUTPUT
4	GROUND
5	ONE-SHOT R.C
6	THRESHOLD
7	INPUT VOLTAGE
8	VCC

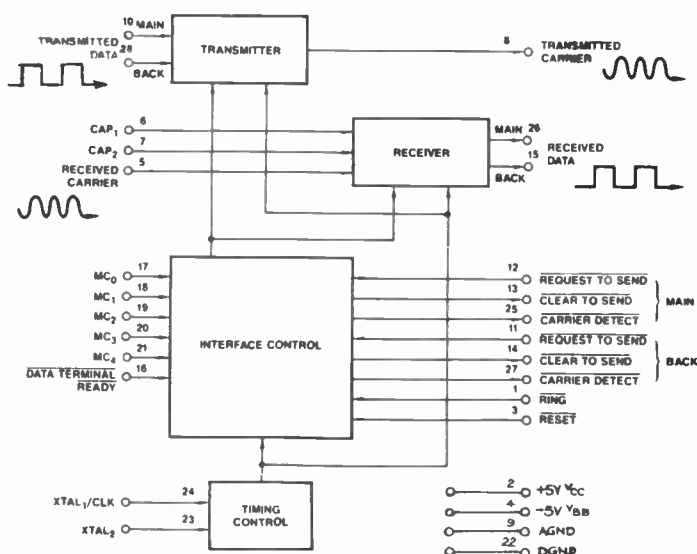
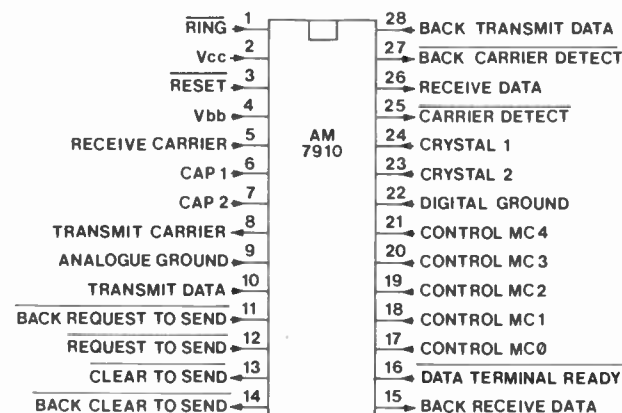
A simple analogue to digital (A/D) converter which is very low cost yet has precision linearity typically $\pm 0.05\%$ with e.g. LF351 used as an integrator, or a linearity or typically 1% on its own. The output of the 4151 is a series of pulses of constant duration whose frequency is proportional to the applied input voltage. Supply voltage range is +8V to +22V, temperature stability is $\pm 100\text{ppm}/^\circ\text{C}$ and the device has a high noise rejection ratio. Max output sink current: 20mA, open collector output.

Order

QW80B (4151)	£1.15
--------------	-------

AM7910 Modem

A single chip modem capable of receiving and transmitting in full duplex, half duplex or simplex at 1200, 600, 300 or 75 bauds at the frequencies of Bell or CCITT standards. The chip performs modulation, demodulation and performs all necessary filtering with its own internal digital filters. The device runs from a single 2.4576 MHz crystal (FY81C) and has all the essential terminal control signals to RS232C/V24 as well as auto answer.



Characteristics (typical)

Supply voltage pin 2 (V _{CC}):	+5V $\pm 5\%$
pin 4 (V _{BB}):	-5V $\pm 5\%$
pin 22:	0V (digital ground)
pin 9:	0V $\pm 50\text{mV}$ (analogue ground)
Output high voltage:	>2.4V at -50µA
Output low voltage:	<0.4V at 2mA
Input high voltage:	2V to V _{CC}
Input low voltage:	-0.5V to +0.8V
Supply current (V _{CC}):	<125mA
(V _{BB}):	<25mA
Analogue input resistance:	>50kΩ
Operating input signal:	-1.6V min, +1.6V max
Analogue output voltage:	-1.1V min, +1.1V max into 600Ω

Order

YH93B (AM7910)	£24.95
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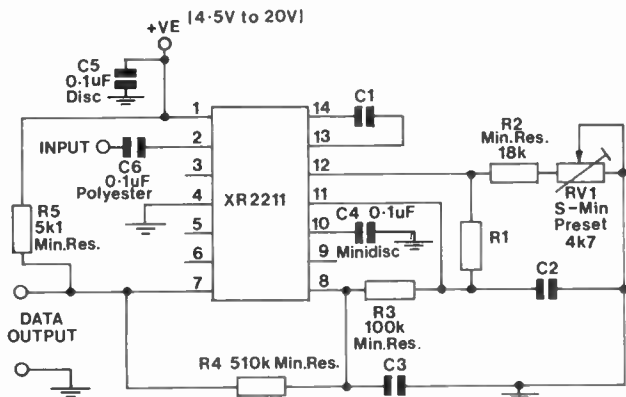
XR2211 FSK Demodulator/Tone Decoder

A monolithic phase locked loop for data communications. The IC contains a basic phase locked loop for tracking an input signal within the pass band, a quadrature phase detector which provided carrier detection and an FSK voltage comparator which provides FSK demodulation. In the circuit shown, the IC is used as an FSK demodulator such as would be found in the receiver circuit of a modem. The table on the next page shows the component values required for a modem demodulator using standard European tones on the public switched network.

Characteristics (typical)

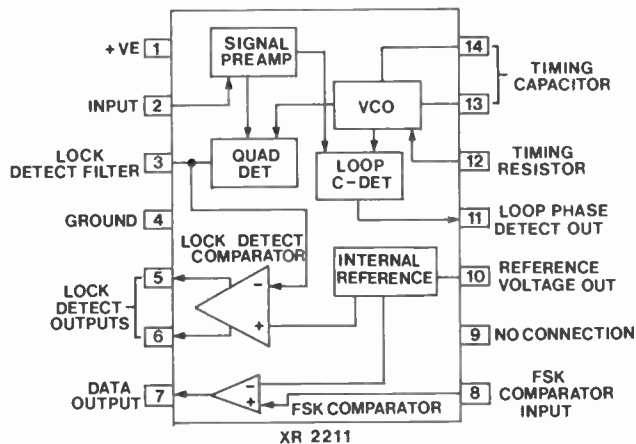
Supply voltage:	4.5V min to 20V max
Supply current:	5mA
Frequency accuracy:	$\pm 1\%$
Stability:	$\pm 20\text{ppm}/^\circ\text{C}$
Upper frequency limit:	300kHz

Lowest practical operating frequency: 0.01Hz
 Timing resistor (R2 + RV1): 5kΩ min, 2MΩ max.
 recommended: 15kΩ min, 100kΩ max.
 Input impedance: 20kΩ
 Input signal voltage: 2mV rms min, 3V rms max.
 Internal reference voltage: 5.3V and 100Ω impedance.



Baud Rate	Receive Frequencies (Hz)	R1 (Ω)	C1 (µF)	C2 (µF)	C3 (µF)
		Min Res	Poly Layer	Poly Layer	Poly Layer
300	980/1180*	100k	0.047	0.01	0.01
300	1650/1850†	180k	0.027	0.0068	0.01
600	1300/1700	75k	0.033	0.0082	0.0047
1200	1300/2100	43k	0.027	0.0068	0.0022
75	390/450	150k	0.012	0.0033	0.047

* Calling modem. † Answering modem.

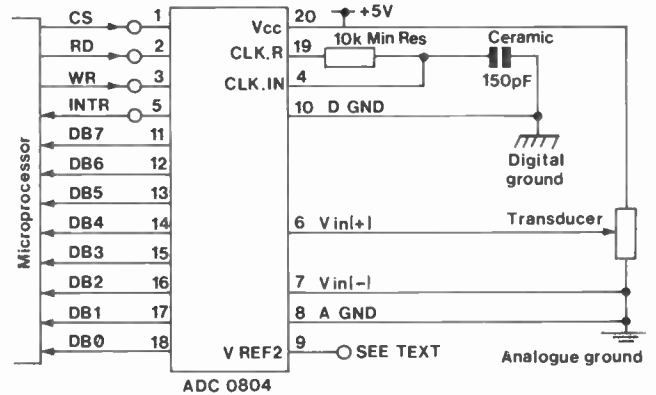
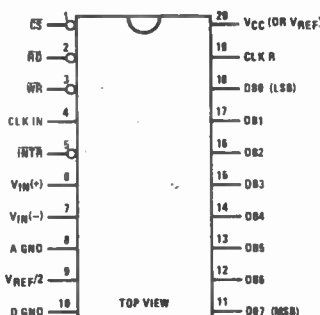


Order
QY43W (XR2211CP) **£2.95**

ADC0804 8-Bit A/D Converter

A CMOS 8-bit analogue to digital converter with output latches that can directly drive a microprocessor data bus. The IC looks like a memory location or I/O port to the microprocessor so no interfacing logic is required. The analogue input voltage range is 0V to 5V with a single 5V supply, and 2.5V applied to pin 9. However, the voltage reference on 9 can be any voltage under 2.5V so that any voltage span can be converted with a full 8-bits of resolution. In addition, by connecting pin 7 to a voltage other than ground the span need not start at 0V. For example if the span was 0.5V to 3.5V (a span of 3V) 0.5V would be applied to pin 7 and 1.5V to pin 9 (i.e. 1/2 of 3V). No zero adjustment is needed with this IC.

Specification
 Supply voltage: +5V (V_{CC})
 Max error: ±1 bit
 Input resistance at pin 9: 1.3kΩ
 Analogue input voltage range: Ground to V_{CC}
 Conversion rate: 8770/second max
 Supply current: 1.3mA



Order
QQ00A (ADC0804LCN) **£4.40**

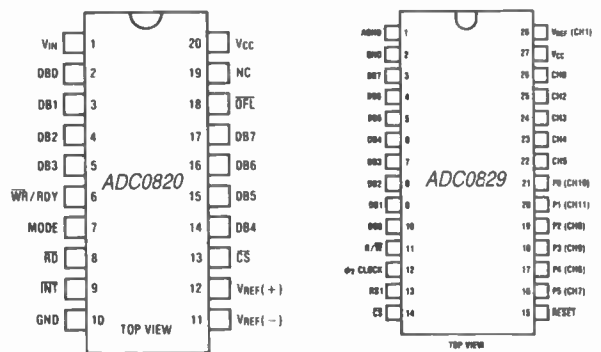
ADC0820CCN 8-Bit High Speed A/D

A CMOS 8-bit A/D converter offering a conversion time of 1.5µs using a 'half-flash' technique where 32 comparators handle the most and least significant bits sequentially in two 4-bit ADC's. The input is tracked and held by the input sampling circuitry eliminating the need for an external sample-and-hold for signals moving at less than 100mV/µs. For ease of interface to microprocessor, the IC is designed to appear as a memory location or I/O port without the need for external interfacing logic. Outputs are 3-state.

Characteristics (typical)

Supply voltage: +5V
 Max error: ±1 LSB
 Analogue input voltage range: Ground to V_{CC}
 Conversion time: 1.5µs
 Supply current: 7.5mA

Order
UF44X (ADC0820CCN) **£19.95**



ADC0829CCN 8-Bit A/D with 11-Channel Multiplexer/Digital Input

A CMOS 8-bit A/D converter with an 11-channel multiplexer, of which 6 can be used as digital inputs, as well as analogue inputs. It is designed to operate from the microprocessor data bus using a single 5V supply. Channel selection, conversion control, software configuration and bus interface logic are all contained on the chip. In addition there are three 16-bit registers, accessed from double-byte instructions: a control (write only) register which controls the start of a new conversion, selects the channel to be converted, configures the 8-bit I/O port as input or output and provides information for the 8-bit output register; a conversion results (read only) register which contains the current status and most recent conversion results; and a discrete input (read only) register which contains the four address bits of the selected channel and the six discrete inputs which are connected to the analogue multiplexer. Outputs are 3-state.

Characteristics (typical)
 Supply voltage: +5V
 Max error: ±1 LSB
 Conversion time: 256µs
 Supply current: <10mA

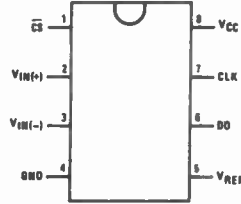
Order
UF45Y (ADC0829CCN) **£14.95**

ADC0831CCN 8-Bit Serial A/D

A TTL compatible 8-bit A/D converter with serial input and output. The differential analogue voltage input allows increasing the common-mode rejection and offsetting the analogue zero input voltage value. In addition, the voltage reference input can be adjusted to allow encoding any smaller analogue voltage span to the full 8 bits of resolution.

Characteristics (typical)

Supply voltage	+5V
Max error	±1 LSB
Conversion time	32µs
Supply current	1mA



Order

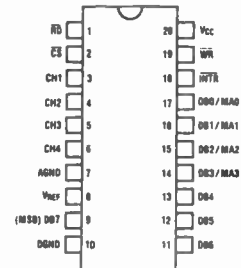
UF46A (ADC0831CCN) £3.95

ADC0844CCN 8-Bit A/D with 4-Channel Multiplexer

A CMOS 8-bit A/D designed to interface directly with 8080 and Z80 series microprocessors. 3-state output latches that directly drive the data bus permit this IC to be configured as a memory location or an I/O device. The 4-channel input multiplexer can be software configured for single-ended, differential or pseudo-differential modes of operation.

Characteristics (typical)

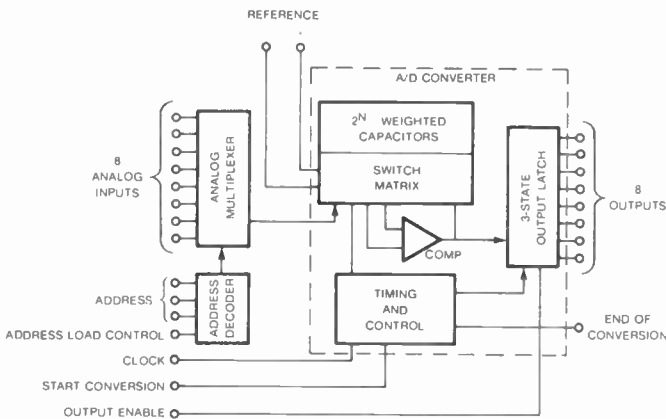
Supply voltage	+5V
Max error	±1 LSB
Conversion time	40µs
Supply current	1mA



Order

UF48C (ADC0844CCN) £5.95

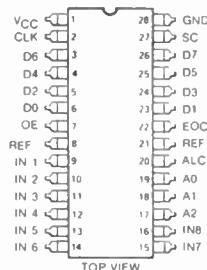
Si520 8-Channel 8-Bit CMOS Data Acquisition System



A single chip containing an 8-channel multiplexer, a sample-and-hold function, an 8-bit A/D converter and microprocessor compatible control logic. The multiplexer requires a 3-bit address to select one of the eight single-ended analogue switches. The input signal is then sampled and held stable for the A/D conversion. Pseudo-ratiometric conversion is possible (i.e. the reference voltage can be selected to determine the analogue input range) eliminating the need for zero or full scale adjustments and ensuring no missing codes. The chip operates from a single 5V low power supply and latching 3-state outputs and latching multiplexer address inputs.

Specification (typical at 25°C)

Supply voltage (V _{CC}):	5V (3V to 5.5V)
Supply current:	10µA
Conversion time:	70µs
Resolution:	8-bit ± 1/2LSB
Positive reference voltage (V _{REF}):	3V to V _{CC}
Negative reference voltage:	0V to 0.3V
Difference between V _{CC} and V _{REF} :	1V max
Total unadjusted error:	±0.25LSB
Clock frequency:	100kHz



Order

RA93B (Si 520) £12.95

AD7581 8-Bit 8-Channel D/A

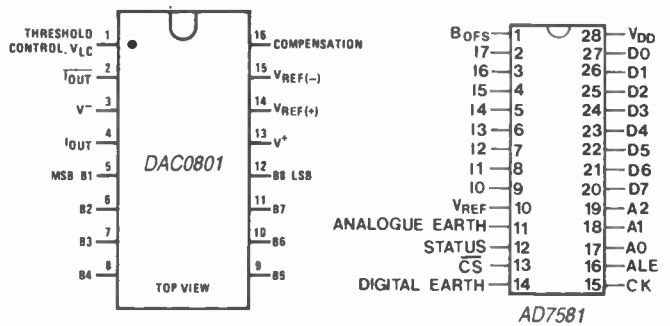
A microprocessor compatible 8-channel, memory-buffered, data acquisition system on a single CMOS chip. The chip contains an A/D converter, an 8-channel multiplexer, an 8x8 dual-port RAM, three-state data bus drivers, address latches and microprocessor compatible control logic. The device interfaces directly to 8080, 8085, Z80, 6800 and other types. The conversions take place on a continuous, channel sequencing, basis using microprocessor control signal for the clock. Data is automatically transferred to its proper location in the 8x8 dual-port RAM at the end of each conversion. When under microprocessor control, a READ data operation is allowed at any time for any channel since on-chip logic provides interleaved DMA. The facility to latch the address inputs (A0 to A2) with ALE enables the chip to interface with microprocessor systems which feature either shared or separate address and data buses.

Characteristics (typical)

Supply voltage	+5V
Max error	±17%LSB
Conversion time	66.6µs
Supply current	3mA

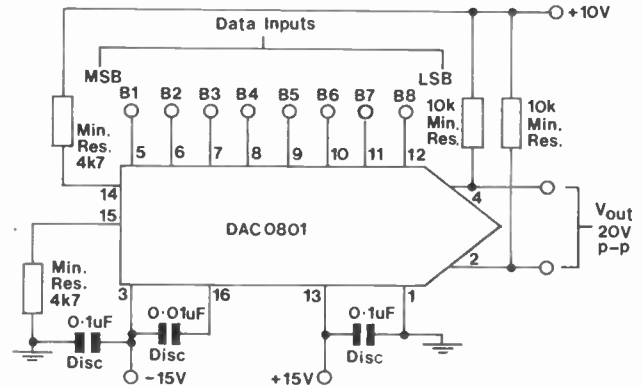
Order

QY56L (7581 ADC) £24.95



DAC0801 8-Bit D/A Converter

An 8-bit digital to analogue converter with a full scale error of less than ±0.39%. The DAC has high compliance complementary current outputs to allow differential output voltages of 20V peak-tp-peak with simple resistor loads.



Specification

Supply voltage:	±4.5V to ±18V
Setting time:	100ns (typical)
Output voltage compliance:	-10V to +18V
Full scale current (V _{ref} = 10V, R _{14,15} = 5kΩ)	1.99mA
Output current range (V ₋ = -5V):	0 to 2.1mA
(V ₋ = -8V to -18V):	0 to 4.2mA
Reference bias current (I ₁₅):	-1µA
Reference input slew rate:	8mA/µsec
Power supply current (V _S = ±5V, I _{ref} = 1mA) I ₁ ⁺ :	2.3mA
I ₁ ⁻ :	4.3mA
Power supply current (V _S = ±15V, I _{ref} = 2mA) I ₁ ⁺ :	2.5mA
I ₁ ⁻ :	-6.5mA

Order

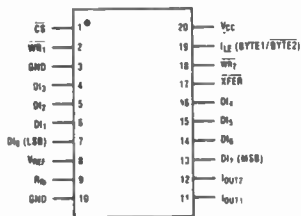
QQ01B (DAC0801LCN) £3.95

DAC0832LCN Double-Buffered D/A

A CMOS 8-bit D/A designed to interface directly with 8080 and Z80 series microprocessors. Double buffering allows this DAC to output a voltage corresponding to one digital word while holding the next digital word.

Characteristics (typical)

Supply voltage	5V to 15V
Settling time	1µs
Supply current	1.2mA



Order

UF47B (DAC0832LCN) £3.95

ZN425E 8-Bit D/A and A/D Converter

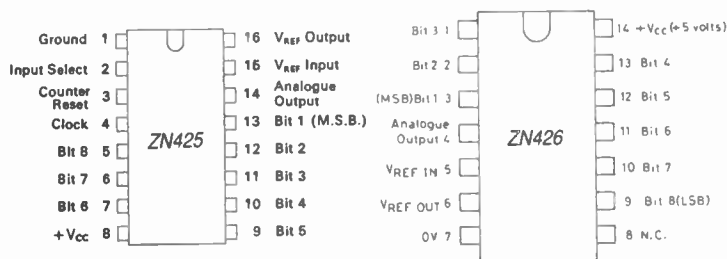
An 8-bit D/A converter also containing a counter and a 2.5V precision voltage reference. By including an 8-bit counter, analogue to digital conversion can be obtained simply by adding an external comparator and clock inhibit gating (7400). By simply clocking the counter, the IC can be used as a self-contained precision ramp generator.

Characteristics (typical)

Supply voltage	4.5 to 5.5V
Settling time	1µs
Voltage reference	2.55V
Non-linearity	±0.5 LSB
Analogue output resistance	10kΩ
Counter clock frequency	5MHz max
Supply current	25mA

Order

UF38R (ZN425E-8) £3.95



ZN426E 8-Bit D/A Converter

An 8-bit D/A converter also containing a 2.5V precision voltage reference. Binary weighted voltages are produced at the output, the value depending on the digital number applied to the input bits.

Characteristics (typical)

Supply voltage	4.5 to 5.5V
Settling time	1µs
Voltage reference	2.55V
Non-linearity	±0.5 LSB
Analogue output resistance	10kΩ
Supply current	5mA

Order

UF39N (ZN426E-8) £2.95

ZN427E 8-Bit A/D Converter

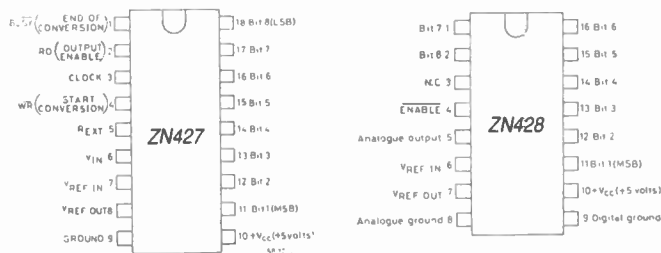
An 8-bit A/D converter with 3-state outputs to permit easy interfacing to a common data bus. The IC contains a voltage switching DAC, a fast comparator, successive approximation logic and a 2.56V precision voltage reference.

Characteristics (typical)

Supply voltage	4.5 to 5.5V
Max error	±0.5 LSB
Conversion time	10µs
Clock frequency	1MHz
Supply current	25mA

Order

UF40T (ZN427E-8) £9.95



ZN428E 8-Bit D/A Converter

An 8-bit D/A converter with input latches to facilitate updating from a data bus. A 2.5V reference is also included. Complementary to ZN427E.

Characteristics (typical)

Supply voltage	4.5 to 5.5V
Linearity error	±0.5 LSB
Settling time	800ns
Voltage reference	2.55V
Analogue output resistance	4kΩ
Supply current	20mA

Order

UF41U (ZN428E-8) £6.95

ZN435E 8-Bit Multifunction Data Converter

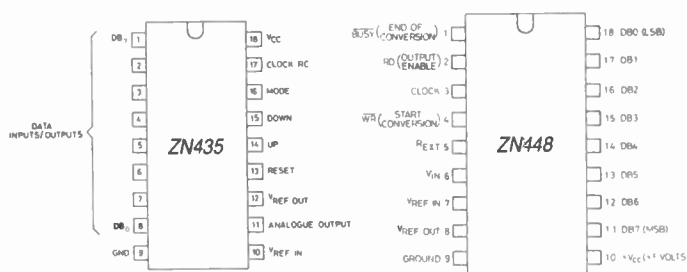
An 8-bit D/A converter which also contains a precision voltage reference, an 8-bit up/down counter and control logic, and an oscillator. The DAC may receive its digital input data from the counter, the counter outputs being simultaneously available at an 8-bit I/O port. Alternatively, the counter outputs may be inhibited and the I/O port used to feed data direct to the DAC inputs. With the addition of a comparator chip, the ZN435E may be used as an A/D.

Characteristics (typical)

Supply voltage	4.5 to 5.5V
Settling time	500ns
Voltage reference	2.55V
Non-linearity	±0.25 LSB
Clock frequency	500kHz max (1.5 MHz with external clock)
Clock resistor	3kΩ to 100kΩ
Clock capacitor	>100pF
Analogue output resistance	4kΩ
Supply current	35mA

Order

UF42V (ZN435E) £6.50



ZN448E 8-Bit A/D Converter

An 8-bit A/D converter designed for easy interfacing to microprocessors. The chip contains a 2.5V precision reference, comparator, clock generator, interface and control logic and 3-state output buffers. Only a reference resistor and capacitor, clock resistor and capacitor and input resistors are required for operation with either uni- or bipolar input voltages.

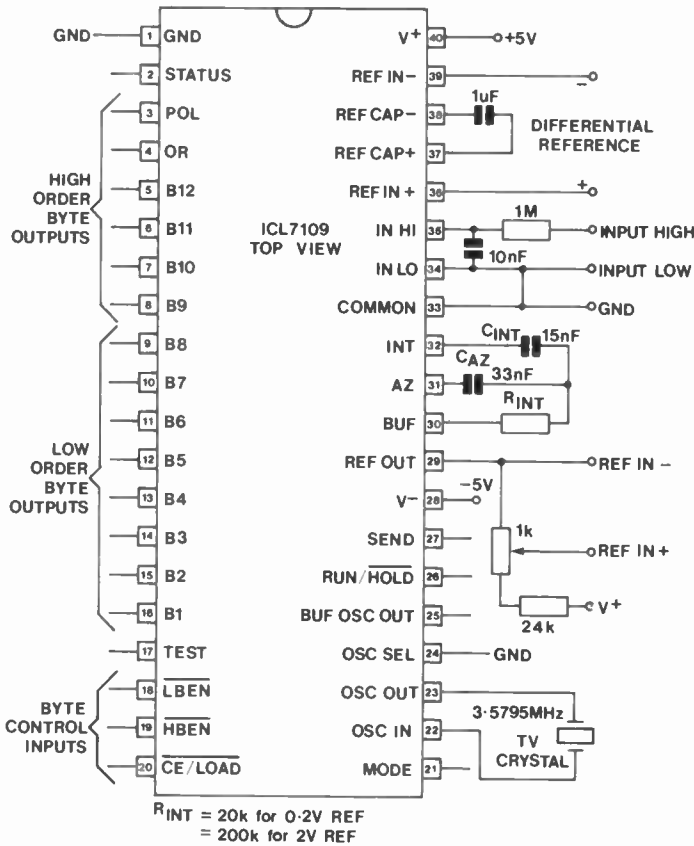
Characteristics (typical)

Supply voltage	4.5 to 5.5V
Max error	±0.5 LSB
Voltage reference	2.55V
Clock frequency	1MHz (max)
Clock resistor	<2kΩ
Conversion time	9µs
Supply current	25mA

Order

UF43W (ZN448E) £8.95

7109 12-Bit A/D Converter



A high performance, low power integrating A/D converter, designed to interface easily to microprocessors. The output data (12 bits, polarity and overrange) may be directly accessed under control of two byte enable inputs and a chip select input for a simple bus parallel interface. A UART handshake mode is provided which allows this device to work with most UART's. The run/hold input and status output allow monitoring and control of conversion timing. Features of this dual-slope integrating analogue to digital converter includes high accuracy, typically ± 0.2 counts; low noise, typically $15\mu V$ peak-to-peak; low drift; true differential input and reference; zero drift of typically $0.2\mu V/^\circ C$; input bias current of typically $1pA$; and a typical power consumption of $20mW$. The device will operate reliably at speeds up to 30 conversions per second from an on-chip oscillator requiring either an external crystal or RC circuit. All inputs are fully protected against static and no special handling precautions are necessary.

Order

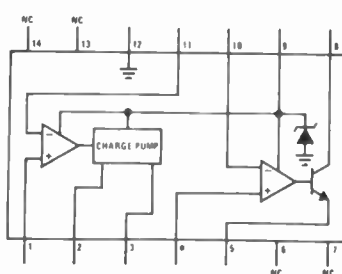
YH59P (ICL7109) £21.95

LM2917 Frequency to Voltage Converter

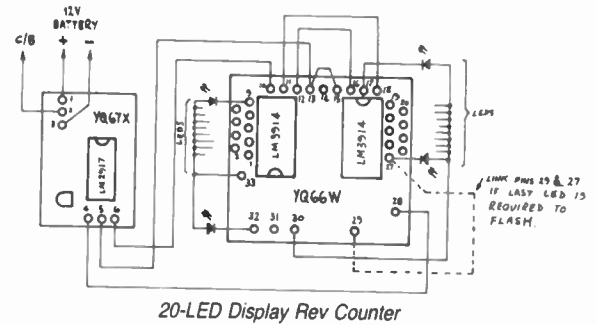
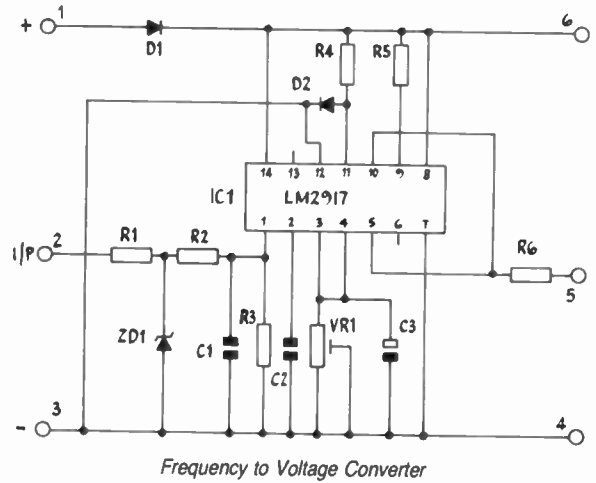
This 14-pin DIL IC is extremely easy to use since $V_{out} = f_{in} \times V_{CC} \times R1 \times C1$ where R1 is the resistor between pin 3 and ground and C1 is the capacitor (in Farads) between pin 2 and ground. Features include ground referenced tachometer whose input interfaces directly with magnetic variable reluctance pick-ups; op-amp comparator with floating relays, solenoids, meters or LED's etc; frequency doubling with low ripple; tachometer with built-in hysteresis for either differential or ground referenced input; built-in zener for accurate and stable frequency to current conversion and linearity typically $\pm 0.3\%$. Applications include over/under speed sensing, tachometers, speedometers, breaker point dwell meters, hand-held tachometers, speed governors, cruise control, touch or sound switches etc.

Parts List

- R1,2 Min Res 4k7
- R3 Min Res 22k
- R4 Min Res 10k
- R5 Min Res 470 Ω
- R6 Min Res 1k
- C1 Poly Layer 0.022 μF (WW33L)
- C2 Poly Layer 0.01 μF (WW29G)
- C3 PC Elect 2.2 μF 63V (FF02C)
- VR1 Hor S-Min Preset 100k (WR61R)
- D1 1N4001 (QL73Q)
- D2 1N4148 (QL80B)
- ZD1 BZY88C12 (QH16S)
- IC1 LM2917 (WQ38R)
- 1 LM2917 PCB (YQ67X)
- 6 Pins 2145 (FL24B)



Application Circuits



A printed circuit board is available to make a frequency to voltage converter building block using the LM2917. A particular application is shown for a 20 LED display rev counter where this pcb is connected to the LM3914 pcb.

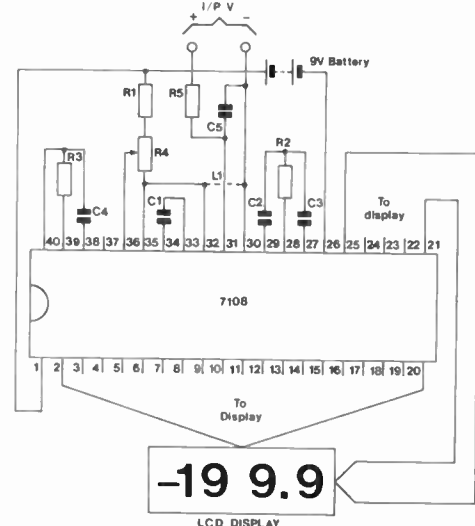
Order

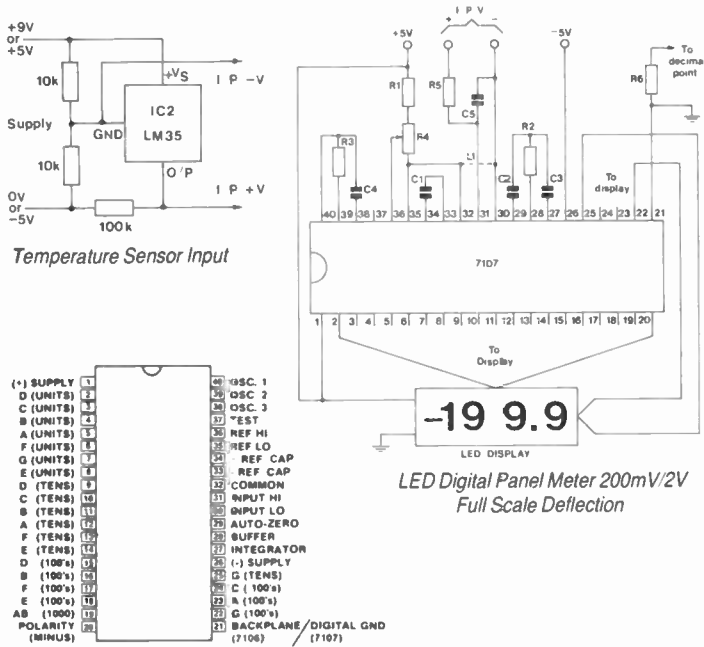
YQ67X (LM2917 PCB) 98p
 WQ38R (LM2917) £3.45

7106, 7107, 7136 Analogue to Digital Converter/Display Drivers

These three IC's are high performance, low power $3\frac{1}{2}$ digit A/D converters. The input requires about $1pA$ typically. Other features are guaranteed zero reading for 0 volts input on all scales; true polarity at zero for precise null detection; true differential input and reference; low-noise; on chip clock and reference; low supply current $0.8mA$ typical. The output of the 7106 and 7136 will drive LCD displays directly and a +9V supply is required at pin 1 and ground at pin 26. These IC's are ideally suited for battery operation since the 7106 requires only $0.8mA$ supply current and the 7136 only $70\mu A$. The output of the 7107 will drive LED displays directly and a +5V supply is required at pin 1, -5V at pin 26 and ground at pin 21. Accuracy ± 1 count in ± 2000 counts guaranteed.

Display Driver and Thermometer PCB





A printed circuit board is available for use with the 7106, 7107 or 7136. The same printed circuit may be used to produce a $\pm 1.999V$ (2V) voltmeter, a ± 0.1999 (200mV) voltmeter or a thermometer using the LM35CZ or LM35DZ IC's shown on page 353, with either an LED or LCD display. A leaflet is supplied with every PCB, which shows how to build and calibrate all six projects. The parts required are shown below.

	7106	7106	7107	7107	7136	7136
	2V LCD	200mV LCD	2V LED	200mV LED	2V LCD	200mV LCD
R1 Min Res	15k	22k	15k	22k	240k	220k
R2 Min Res	470k	470k	470k	470k	1M8	180k
R3 Min Res	100k	100k	100k	100k	180k	180k
R4 23-turn Cermet	10k	1k	10k	1k	100k	10k
R5 Min Res	1M	1M	1M	1M	1M	1M
R6 Min Res	-	-	150 Ω	150 Ω	-	-
C1 Poly Layer	0.1 μ F	0.1 μ F	0.1 μ F	0.1 μ F	0.1 μ F	0.1 μ F
C2 Poly Layer	0.047 μ F	0.047 μ F	0.047 μ F	0.047 μ F	0.1 μ F	0.47 μ F
C3 Poly Layer	0.22 μ F	0.22 μ F	0.22 μ F	0.22 μ F	0.047 μ F	0.047 μ F
C4 Ceramic	100pF	100pF	100pF	100pF	47pF	47pF
C5 Poly Layer	0.01 μ F	0.01 μ F	0.01 μ F	0.01 μ F	0.01 μ F	0.01 μ F
IC1	7106	7106	7107	7107	7136	7136
Link L1	Yes	Yes	Yes	Yes	Yes	Yes
DIL Socket 40-pin	1	1	1	1	1	1
PCB (BY76H)	1	1	1	1	1	1
Display - 1 needed	FY89W	FY89W	BY66W	BY66W	FY89W	FY89W
Display - 1 needed	-	-	BY67X	BY67X	-	-

Order

QW94C (7106)	£8.95
QW95D (7107)	£9.95
UF28F (7136CPL)	£8.95
BY76H (7106/7 PCB)	£1.75

TRANSISTOR AND IC SOCKETS



PCB mounting low-profile sockets with contacts on a 0.1in pitch (except I.C. Skt 10-Lead). Glass filled nylon body with gold-plated phosphor-bronze contacts. Current rating: 1A per contact. Types are available for 3-lead and 4-lead TO18 transistors, 3-lead TO5 transistors and 10-lead TO100 IC's. Overall height 9.1mm. Pin length 3.5mm. Body dia: TO18 types 7.1mm, TO5 types 10.9mm.

Order

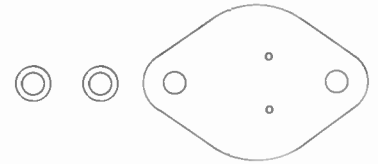
WR29G (Transkt 3-Lead TO18)	20p
WR30H (Transkt 4-Lead TO18)	38p
WR31J (Transkt 3-Lead TO5)	20p
WR33L (IC Skt 10-Lead)	74p

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

SEMICONDUCTOR MOUNTING KITS

TO3

For mounting TO3 case transistors on heatsinks. Kit comprises one mica washer and two insulating bushes.

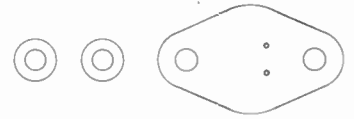


Order

WR24B (Kit TO3)	10p
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TO66

For mounting TO66 case transistors on heatsinks. Kit comprises one mica washer and two insulating bushes.

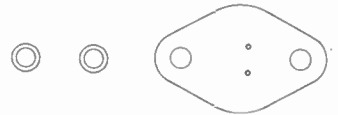


Order

WR25C (Kit TO66)	9p
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SO55

For mounting SO55 case transistors on heatsinks. Kit comprises one mica washer and two insulating bushes.

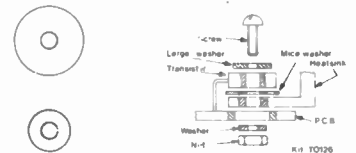


Order

WR27E (Kit SO55)	9p
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TO126

For mounting TO126 case transistors on heatsinks. Kit comprises one mica washer and one large washer to cover plastic side of transistor.

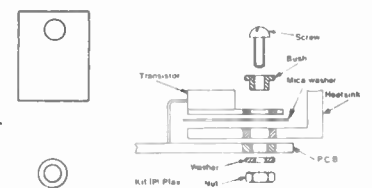


Order

WR26D (Kit TO126)	5p
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Plastic TO66 (P)

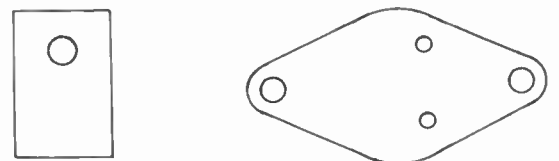
For mounting plastic TO66 case (P1, P2 and P3) semiconductors one mica washer and one insulating bush.



Order

WR23A (Kit (P) Plas)	7p
----------------------	----

GREASELESS SEMICONDUCTOR INSULATORS



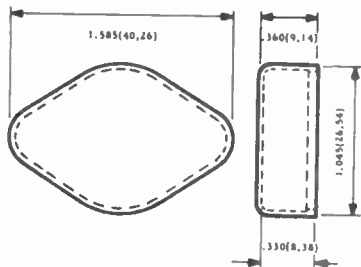
Power transistor mounting insulators that give excellent heat conduction without the need for silicone grease. The heat transfer capability without silicone grease is marginally better than mica or plastic with silicone grease, yet they offer similar electrical resistance (at least 1G Ω). They are exceptionally easy and clean to use and make assembly extremely fast. Two types are available, one for TO3 packages and one for TO126 and plastic power packages.

Order

QY44X (Insulator TO3)	28p
QY45Y (Insulator P)	15p

TO3 INSULATING COVER

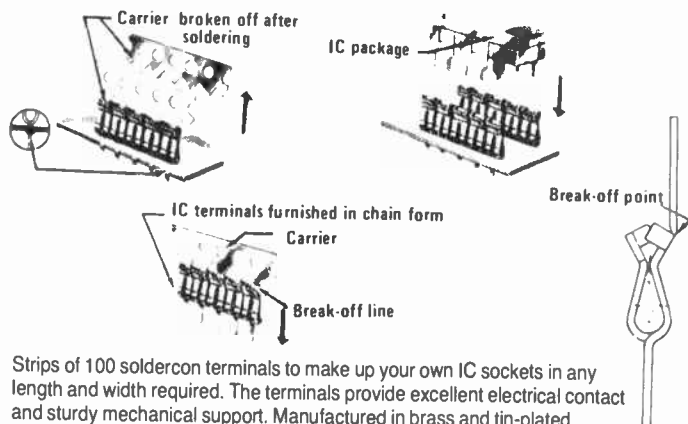
A clip-on plastic insulating cover for TO3 case transistors. Prevents short circuits and provides insulation up to 30kV.



Order

FL56L (Transistor Cover) 10p

SOLDERCON TERMINALS



Strips of 100 soldercon terminals to make up your own IC sockets in any length and width required. The terminals provide excellent electrical contact and sturdy mechanical support. Manufactured in brass and tin-plated.

Order

XX14Q (Soldercons) £1.95

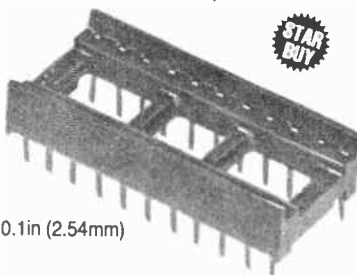
DUAL-IN-LINE SOCKETS

A range of high quality low-profile dual-in-line sockets with black glass-reinforced polyester bodies and tin-plated phosphor-bronze contacts. The contact makes against the flat face of the IC leg for maximum contact area and low insertion pressure. Sockets may be mounted end to end to achieve longer continuous runs of 0.1 in spaced sockets. Sockets have chamfered side walls to assist insertion. The ultra-reliable, precision-stamped dual-wipe contacts offer an anti-oversstress feature to prevent contact spring damage. One end is indented for polarisation.

Dimensions:

Pin Length: 3mm
Overall height above pcb: 4.5mm
Height above pcb to base of IC: 4mm
PCB hole required: 0.3mm x 0.6mm pin
Distance between sockets (lengthwise): 0.1 in (2.54mm)

The following types are available



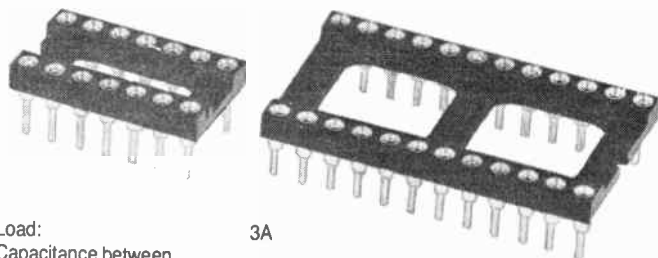
Type	Pin spacing (mm)	Pin spacing (in)	Overall length (mm)	Overall length (in)	Overall width (mm)	Overall width (in)
8-pin	7.62	0.3	10.16	0.4	10.16	0.4
14-pin	7.62	0.3	17.78	0.7	10.16	0.4
16-pin	7.62	0.3	20.32	0.8	10.16	0.4
18-pin	7.62	0.3	22.86	0.9	10.16	0.4
20-pin	7.62	0.3	25.4	1.0	10.16	0.4
22-pin	10.16	0.4	27.94	1.1	12.7	0.5
24-pin	15.24	0.6	30.48	1.2	17.78	0.7
28-pin	15.24	0.6	35.56	1.4	17.78	0.7
40-pin	15.24	0.6	50.8	2.0	17.78	0.7

Order

BL17T (DIL Socket 8-pin)	5p
BL18U (DIL Socket 14-pin)	8p
BL19V (DIL Socket 16-pin)	9p
HQ76H (DIL Socket 18-pin)	10p
HQ77J (DIL Socket 20-pin)	11p
HQ78K (DIL Socket 22-pin)	14p
BL20W (DIL Socket 24-pin)	14p
BL21X (DIL Socket 28-pin)	15p
HQ38R (DIL Socket 40-pin)	22p

TURNUED PIN DUAL-IN-LINE SOCKETS

A range of very high quality sockets with >0.8µ gold over 1.5µ nickel-plated beryllium copper contact clips and 5µ tin-plated sleeves. Moulding is black, self-extinguishing polyester to UL SE 0.



Load: 3A
Capacitance between contacts: <0.4pF
Body height: 3mm
Pin length: 4.3mm
1.1mm at 1.35mm diameter and 3.2mm at 0.5mm diameter
Contact resistance: <7mΩ after 1000 insertions

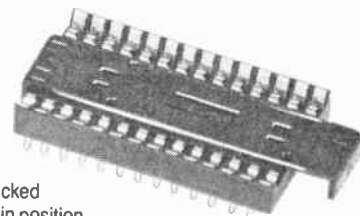
All other dimensions as Dual-In-Line Sockets in previous column.

Order

FJ63T (Turned Pin Skt 8-pin)	25p
FJ64U (Turned Pn Skt 14-pin)	45p
FJ65V (Turned Pn Skt 16-pin)	48p
FJ66W (Turned Pn Skt 18-pin)	54p
FJ67X (Turned Pn Skt 24-pin)	68p
FJ68Y (Turned Pn Skt 28-pin)	80p
FJ69A (Turned Pn Skt 40-pin)	£1.20

ZERO INSERTION FORCE IC SOCKET

A range of DIL sockets ideally suited for programming EPROM's where different IC's must be inserted in one socket. With the lever in the unlocked position, IC's may be inserted or withdrawn with no force. When the IC has been inserted, push the lever over to the locked position and the IC will be held firmly in position with excellent contact to all leads.

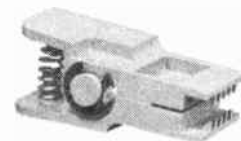


Order

YX50E (ZIF Socket 24-Way)	£5.95
FT14Q (ZIF Socket 28-way)	£5.95
FT15R (ZIF Socket 40-way)	£6.95

I.C. INSERTION TOOL

A high quality tool which makes inserting integrated circuits one simple operation. No more complicated alignment of pins or handling problems.

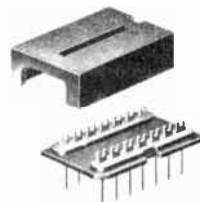


Order

FR25C (Insertion Tool) 78p

DUAL-IN-LINE HEADERS

A range of adaptors that plug into DIL sockets of the same size to provide a versatile and inexpensive means of board to board inter-connection. The adaptors could also be used for mounting e.g. resistor or diode networks that may need to be changed quickly. The adaptors are supplied complete with a plastic clip-on cover.



Dimensions	14-pin	16-pin	24-pin	28-pin	40-pin
Cover height:	5mm	5mm	5mm	5mm	5mm
Pin length:	4.7mm	4.7mm	4.7mm	4.7mm	4.7mm
Width:	12.4mm	12.4mm	20.1mm	20.1mm	20.1mm
Length:	20mm	22.6mm	32.8mm	36.8mm	52mm

Order

YG27E (Header 14-pin)	78p
YG28F (Header 16-pin)	78p
YG29G (Header 24-pin)	£1.10
FA05F (Header 28-pin)	£2.99
FA06G (Header 40-pin)	£4.25

HEATSINKS

For Case Style TO92

Push-fit brass radiator suitable for TO92 and E-line transistor packages. The heat is partly radiated and partly conducted back into the PCB through the location pegs being soldered to the PCB on 10.16mm (0.4in.) centres. The heatsink may be inverted if PCB fixing is not required.

Overall size: 13.7mm wide, 13.8mm high plus mounting lugs, 11.4mm deep.

Temperature rise in free-standing mode: 50°C/W

Temperature rise fixed to PCB: 36°C/W



Order

HQ79L (Heatsink 92F) 18p

For Case Style TO18

Push-fit, lobed radiation fin in black anodised finish. Outside dimensions: 15mm diameter, 12.7mm high. Temperature rise: 50°C/W



Order

HQ80B (Heatsink 18F) 28p

For Case Style TO5

Push-fit, lobed radiation fin in black anodised finish. Outside dimensions: 15.8mm diameter, 12.7mm high. Temperature rise: 47°C/W.



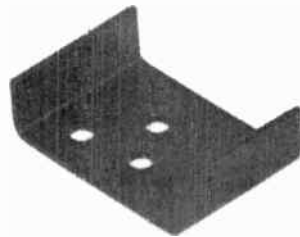
Order

FL78K (Heatsink Clip-On) 24p

For Case Style TO3

Basic Radiator

A basic fin radiator in matt black finish, pre-drilled to accept a standard TO3 transistor. Overall size: 44.5 x 31.5 x 14mm high. Temperature rise: 14°C/W

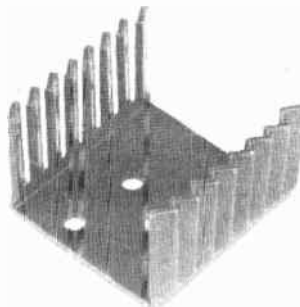


Order

FG50E (Basic TO3 Fin) 45p

Twisted Vane

A twisted vane radiator in matt black finish, pre-drilled to accept a standard TO3 transistor. Overall size: 42 x 38 x 25mm high. Temperature rise: 7.2°C/W.



Order

FL59P (Vaned Heatsink TO3) 48p

High Power Twisted Vane

A diamond pattern vaned radiator in matt black finish, pre-drilled to accept a standard TO3 transistor. Overall size: 48mm long, 35mm wide, x 32mm high. Temperature rise: 4.8°C/W



Order

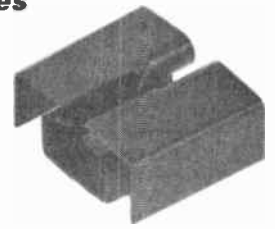
FG51F (Powerfin TO3) 68p

For Plastic Package Devices

Clip On

A low-cost clip-on heatsink for TO220 style devices. The TO220 package is inserted into the clip as far as the dimple and is then retained by the pressure applied directly above the device junction, thus providing optimum thermal transfer. Black anodised finish.

Overall size: 21.84 x 19.05 x 10.03mm. Temperature rise: 23.3°C/W



Order

FG52G (Clip on TO220) 35p

Twisted Vane

A twisted vane radiator in matt black finish, pre-drilled to accept almost any flat plastic package device. Overall size: 22 x 19 x 19mm high. Temperature rise: 17°C/W

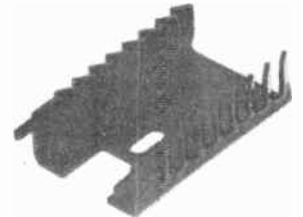


Order

FL58N (Vaned Htsnk Plas Pwr) 38p

TO202 Style

A twisted vane radiator in matt black finish, pre-drilled to accept TO202 style devices e.g. C106D. Overall size: 30 x 12.7 x 45mm long plus mounting lugs. Temperature rise: 12.3°C/W.

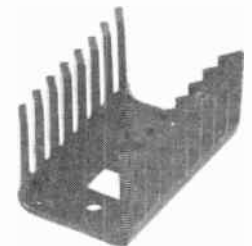


Order

FG53H (Vaned Heatsink TO202) 48p

TO220 5-Lead Style

A twisted vane radiator in matt black finish, pre-drilled to accept 5-lead TO220 (Pentawatt) style devices e.g. LM383. Overall size: 38 x 28 x 22mm high. Temperature rise: 11°C/W.

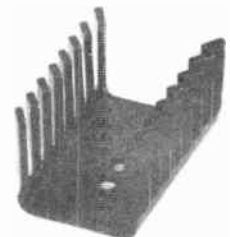


Order

FG54J (Vaned Heatsink Penta) 85p

High Power Twisted Vane

A twisted vane radiator in matt black finish, pre-drilled to accept almost any flat plastic package device. Overall size: 38 x 28 x 22mm high. Temperature rise: 10.5°C/W.



Order

FG55K (Powerfin plastic) 48p

High Performance TO220

Very high performance 4-sided heatsinks pre-drilled for TO220 style devices in black anodised finish. Both types have a 45.21mm square base.



Continued on next page.

High Performance TO220 Continued

	HP-type	EHP-type
Height of fins	12.7mm	25.4mm
Temperature rise	7.5°C/W	5.8°C/W

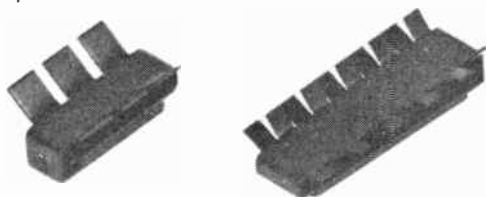


Order

FG60Q (Heatsink TO220HP)	88p
FG61R (Heatsink TO220 EHP)	88p

For DIL Packages

A low-cost clip-on heatsink for 14, 16 or 40 pin DIL packages. The heatsink has two separate conduction paths that remove heat from both top and bottom of the package. The double spring action brings top and bottom surfaces into parallel with the package for a snug fit regardless of the thickness of the IC. Whether the IC is mounted with or without a socket, the heatsink simply slides on and a locking tab secures it in place without any need for gluing. The lower spring has a tapered leading edge to aid insertion. On the 40-pin type, the fins are at varying angles to improve thermal performance.



	14/16-pin type	40-pin type
Overall length	22.5mm	57.3mm
Overall width	15.2mm	24.9mm
Overall height	10.4mm	15mm
Temperature rise	18°C/W	18°C/W

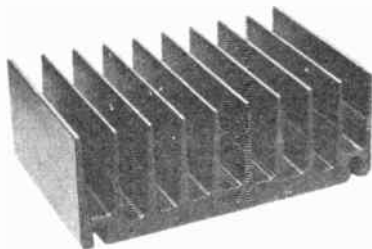
Order

FG62S (Dip Sink 14/16)	60p
FG63T (Dip Sink 40 pin)	80p

High Power Types

Type 2E

Plain undrilled aluminium heatsink. Dimensions:
 Width: 80mm (3.15in);
 Length: 51mm (2in);
 Thickness: 30mm (1.2in).
 Temperature rise in centre of heat sink: 2.1°C per watt.

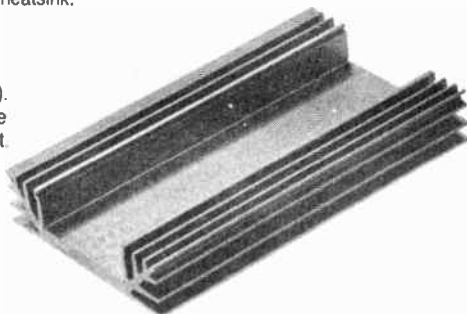


Order

HQ70M (Heatsink 2E)	£2.95
---------------------	-------

Type 4Y

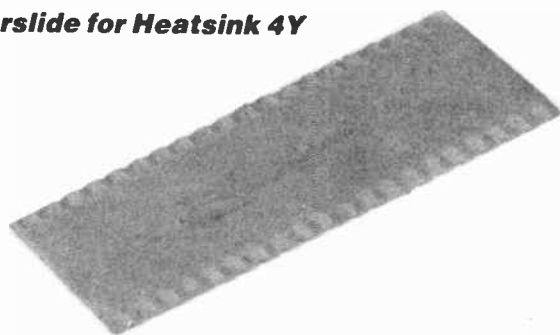
Plain undrilled aluminium heatsink. Dimensions:
 Width: 60mm (2.4in).
 Length: 102mm (4in).
 Thickness: 16mm (0.63in).
 Temperature rise in centre of heatsink: 4.5°C per watt.



Order

FL41U (Heatsink 4Y)	£2.25
---------------------	-------

Coverslide for Heatsink 4Y

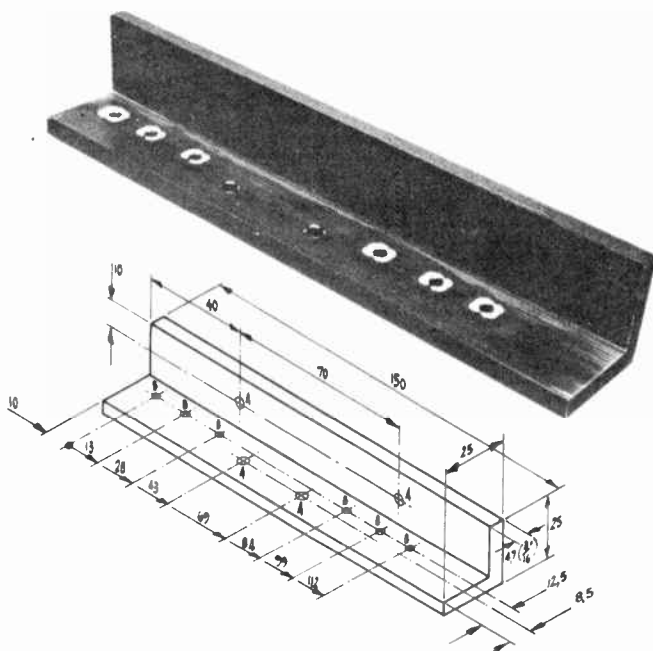


A fibreboard cover that slides into the heatsink to protect against unintentional contact with the mounted devices. The cover also augments cooling due to a "chimney" effect. The convoluted edge of the cover fits snugly in the groove on the heatsink.

Order

FG64U (Coverslide 4Y)	35p
-----------------------	-----

50W Hi-Fi Heatsink

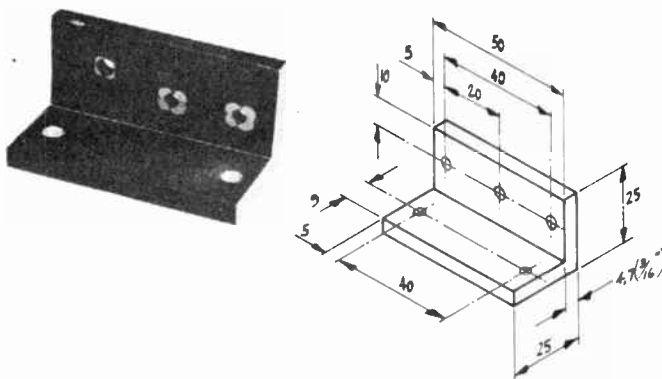


Designed to bolt to a pcb, the power transistors then bolt on to this heatsink and a further heatsink may be bolted to it. It is therefore an ideal method of transferring heat from on-board plastic power transistors to a large finned heatsink easily. Manufactured in aluminium angle 4.76mm (3/16in.) thick and black anodised.

Order

HQ69A (50W Hi-Fi Heatsink)	£1.95
----------------------------	-------

8W Hi-Fi Heatsink

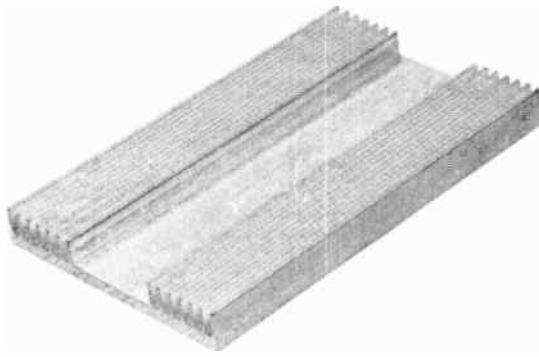


As 50W Heatsink, but shorter and designed for one plastic power transistor or power IC.

Order

HQ81C (8W Hi-Fi Heatsink)	98p
---------------------------	-----

Flat Type



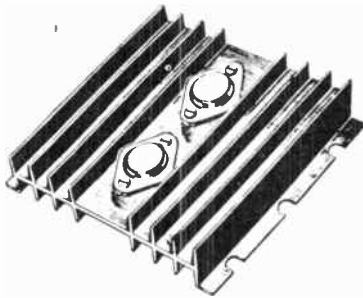
Plain undrilled aluminium heatsink ideal for printed circuit boards and suitable for external mounting on equipment.
 Dimensions: Width: 94mm (3.7in); Length: 152mm (6in.); Thickness: 14mm (0.6in). Temperature rise in centre of heatsink: 2.6°C per watt.

Order

FL42V (Flat Heatsink) £3.95

Type 10DN

Plain aluminium undrilled heatsink.
 Dimensions: 27mm deep x 124mm wide (across fins) x 102mm long. Temperature rise in centre of heatsink: 2.1°C per watt.



Order

FL54J (Heatsink 10DN) £2.45

Type 10NDR

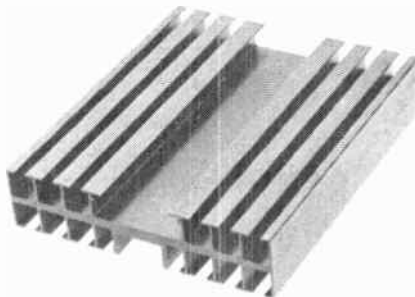
Similar to Type 10DN but drilled ready to accept one or two TO3 package transistors. Mounting notches are also cut.

Order

FL55K (Heatsink 10NDR) £2.95

Type 6W-1

Plain undrilled aluminium heatsink. Dimensions: Width: 130mm (5.1in); Length: 152mm (6in); Thickness: 32mm (1.25in). Temperature rise in centre of heatsink: 1.1°C per watt.



Order

FL77J (Heatsink 6W-1) £6.95

Coverslide For Heatsink 6W-1

As Coverslide for 4Y heatsink on previous page, but to fit 6W heatsink.

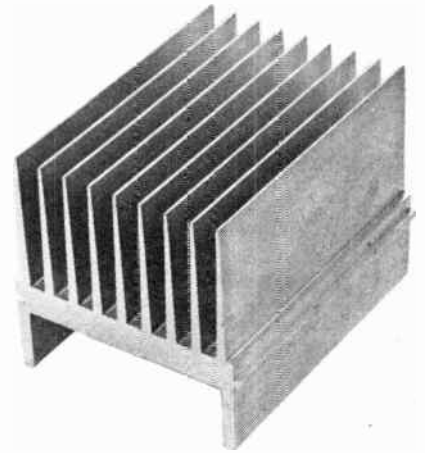


Order

FG65V (Coverslide 6W) 35p

Type 60DN For Very High Power Applications

Plain aluminium undrilled heatsink.



Dimensions:

Width: 117.5mm (4.6in)
 Length: 150mm (5.9in)
 Thickness: 114.3mm (4.5in)
 Temperature rise in centre of heatsink: 0.58°C per watt.

Order

YB26D (Heatsink 60DN) £19.95

HEAT TRANSFER COMPOUND

Large Syringe



Heat transferring grease having about 3½ times the thermal transmission of ordinary silicone grease. The material is non-irritant except to the eyes. In the case of such contamination wash freely with water until the smarting stops. Supplied in a box with syringe-type applicator for accurate and wasteless placement of the compound. Contains 10ml.

Order

FL79L (Silicone Grease 10ml) £1.65

Small Syringe



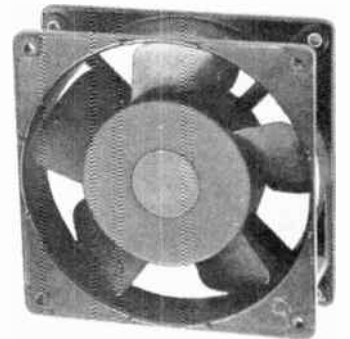
A syringe containing 2gms of heat transfer compound as above.

Order

HQ00A (Silicone Grease Tube) 65p

AXIAL FAN

A 240V AC mains axial fan for cooling, extraction, intake, ventilation etc. Standard 4½in. diameter size. The unit features an impedance protected motor with sintered bronze sleeve bearing. The frame (venturi) is flame retardant black phenolic with an aluminium alloy spider and hub for maximum heat dissipation, and the five blade impeller is a flame retardant polypropylene moulding. Connection is made to two solder tags in the frame, and the metal parts of the structure can be earthed through the chassis mounting bolts.



Specification:

Power consumption: 14W
 Continuous life: 20,000 hours at 55°C, 10,000 hours at 70°C
 Motor current: 125mA
 Stall current: 140mA
 Noise level: 44dB @ 1m
 Max Airflow: 80cu.ft/minute at normal air pressure (27.75 litres/s)
 Overall dimensions: 119 x 119 x 39mm
 Cut-out: 114mm (4½in.) diameter
 Fixing centres: 104 x 104mm x 4BA clear

Order

WY08J (Standard Fan) £13.95

SPEAKERS AND SOUNDERS

Brackets	392	Earpieces	386	PA Speakers	392
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TRANSDUCERS

Ultrasonic Transducers

A high sensitivity ultrasonic transmitter and receiver, sold only in pairs, for sending and receiving ultrasonic sound through the air, either as a continuous wave or pulses. Applications include burglar alarm systems, proximity switches, liquid level meters, anti-collision devices, counters for moving objects, TV remote control systems etc.



Characteristics

	SCS-4 Transmitter	SCM-4 Receiver
Sensitivity (dB)	17±6*	-56±6†
Resonant freq. (kHz)	40±1	40±1
Max. input (Vrms)	7	—
Impedance (Ω) approx	200	70k
Capacitance (pF) ±20%	1400	1400
Pulse rise time (msec)	2	0.5
Max input voltage, pulse operation:	60V p-p	—

* 0dB = 1μBar/V/m

† 0dB = 1V/μBar with 47kΩ shunt.

Overall size 15mm dia x 12mm deep (connecting pins protrude a further 9mm) Pins are 10mm apart.

Order

HY12N (Ultrasonic Transducer) £3.95

Piezo Transducers



These ceramic piezo buzzer elements generate a range of audible tones and frequencies when energised by a 3V peak square wave. They can be driven direct from CMOS IC's with low power consumption. They are supplied unhused and without wires. Provided they are mounted rigidly in the prescribed manner, outputs of up to 90dB can be achieved. In addition to a wide range of applications where audible warnings or indications are preferred to visual, other uses include toys, clocks and watches, calculators and electronic games, using the buzzer in place of a speaker. Because there are no moving parts to wear out, these elements are reliable for use in professional, commercial and industrial applications. They withstand severe environmental conditions and prove durable in domestic appliances without causing r.f. interference.

Specification

Frequency range:	3 to 10kHz
Max. input voltage:	30V peak to peak
Achievable output @ 3V p-p	70dB @ 5mA
Achievable output @ 30V p-p	90dB @ 8mA
Resonance impedance:	200kΩ
Capacitance:	10,000 to 25,000pF
Temperature range:	-20 to +80°C
Typical frequency drift:	-0.1%/°C
Typical capacitance drift:	+0.2%/°C
Base diameter:	27mm

NOTE: These transducers are supplied without wires and unmounted. Soldering to the silvered electrode must be done with the minimum of heat for a fraction of a second, or destruction of the silvering begins to occur. The brass rim of the transducer is a large heatsink and will require more heat, but the minimum of solder should be used. The transducers may be mounted to a suitable surface using any suitable adhesive.

Order

QY13P (Piezo Transducer 27mm) 30p

Rubber Disc

A rubber disc for use with the Piezo Transducers. Fitted over the transducer it can be tapped to produce either sounds or an electrical signal. 27mm diameter.



Order

QY16S (Rubber Disc 27mm) 5p

BUZZERS

Miniature Buzzer

A miniature solid state buzzer featuring long life, high reliability, low current drain, no moving contacts, no arcing, no r.f. noise. It is small but with a clear penetrating sound.

Dimensions:	23 x 16.4 x 15.7mm deep.
Fixing centres:	27mm x 8BA
Overall length:	33.5mm.

Finished in cream plastic. Two types are available:

Specification

Type	Voltage range	Impedance	Frequency	Output at 1 metre
6V	4 to 9V	240Ω	450Hz	>70dB
12V	9 to 20V	480Ω	450Hz	>70dB

Buzzers are for DC operation only and approx 100mm of lead attached is colour coded:
Red - positive: Black - negative.

Order

FL39N (Buzzer 6V) £1.25
FL40T (Buzzer 12V) £1.25

Low Profile Piezo Buzzer NEW

A piezo-electric sounder ideal for use in applications where space is at a premium. As used in our Live Wire Detector kit. Dimensions are only 30mm diameter x 4.5mm thick, with fixing centres at 34mm (x 8BA/M2). Resonance: 3.8kHz. Capacitance: 20nF. Output level: 90dB @ 10cm. Drive voltage: 10V peak to peak.



Order

FM59P (Min Piezo Sounder) 78p

Round Buzzers

Small, round electronic buzzers similar in principle to the miniature solid state buzzers above, but louder. 6V and 12V types are available. Each buzzer measures 41mm across mounting lugs, 25mm diameter and 17mm high. Fixing centres 32mm.



Specification

Type	Voltage range	Current	Frequency	Output at 1 metre
6V	4 to 9V	35mA	450Hz	85dB
12V	9 to 20V	35mA	450Hz	85dB

Order

FK81C (6V Buzzer) £1.60
FK82D (12V Buzzer) £1.60

Pulse Tone Buzzer

A buzzer having a clear, penetrating, intermittent tone. It incorporates a contactless electro-magnetically activated sound generation system. Pulse rate is in the range 2Hz to 7Hz. 12V operation. Size 40mm x 28mm x 20mm. Fixing centres 34mm. Voltage range 8 to 15V. Current 15mA. Frequency 2.8kHz. Output 80dB at 1m.



Order

FK83E (PT Buzzer) £1.60

High Power Buzzer

A solid state driven, piezo electric buzzer with a very wide operating voltage range and a loud, demanding tone. Size 60 x 39 x 28mm. Fixing centres 50mm. Voltage range 3V to 24V. Current 15mA. Frequency 3.3kHz. Output 100dB at 1m.

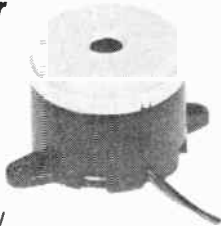


Order

FK84F (HP Buzzer) £2.20

Musical Buzzer

A musical 'buzzer' which plays seven popular American tunes. These include Yellow Rose of Texas, Land of Dixie, Red White and Blue, When The Saints Come Marching In, etc. Runs from a 9V supply. Size 40 x 27 x 22mm. Fixing centres 34mm.



Order

FK80B (Musical Buzzer LBM 7) £3.95

BELLS AND ACCESSORIES

Bell

3 to 8V AC or DC bell with white case and polished chrome 70mm dia. gong. Overall size 141 x 75 x 31mm.

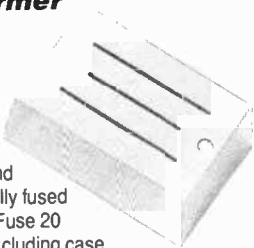


Order

FL38R (AC Bell) £2.50

Bell Transformer

A transformer housed in a white plastic case. Primary 240V AC, secondary 4, 8 and 12V AC at 1A. Internally fused primary winding with Fuse 20 50mA. Overall size excluding case fixing nut 74 x 54 x 38mm.



Order

FL37S (Bell Xformer) £5.95

Bell Push with Nameplate

A white plastic bell push with luminous button and name plate. Dimensions: 87 x 30 x 19mm.



Order

FO90K (Nameplate Bell Push) 60p

250VAC Dome Bell

A domed bell for 200-250V AC operation. The 6" domed gong is adjusted at the factory for optimum sound and must NOT be removed.

The bell mounts on to either a standard conduit box, or a weatherproof mounting (not supplied), and can be readily dismantled by undoing one screw.

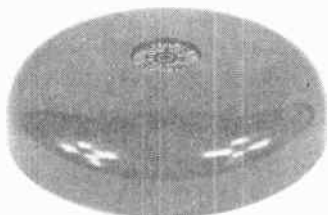


Order

YK58N (Large Dome Bell) £15.95

12VDC Dome Bell

A 6in dia. dome bell finished in grey, which operates from 12 volts DC making it especially suitable for low power sources, where the use of a mains powered bell constitutes a hazard, or is simply impossible, for example the Maplin Home Security System. The bell produces a loud ringing whilst only drawing 60mA. A removable back-plate facilitates easy fixing.



Order

YK85G (12v Dome Bell) £13.95

SIRENS

Low-Cost Siren

A small, but penetrating siren finished in red plastic. Operates by spinning a fan inside the case to give a loud output. Adjustable mounting bracket and approx. 550mm of lead.

Operating voltage: 12V DC
Current drain: 1A approx.
Size: 72mm dia x 78mm deep
Bracket size: 71 x 9.5mm
Fixing centres: 25.5 x 4BA (M4) clear.



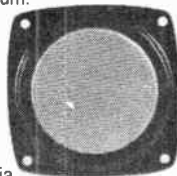
Order

LH96E (Plastic Siren) £5.95

Small Electronic Siren

A small electronic alarm siren that emits a loud 'yelp' sound. Self-contained in a metal case for flush mounting, this is an ideal small siren where space and current drain are at a premium.

Operating voltage: 12V DC
Current drain: 250mA
Impedance: 8 ohms
Sound output: 92dB at 1m
Case: Steel (black finish)
Size: Face plate 77 x 77mm
Rear housing 56mm dia
Fixing holes 61mm centres



Weight: 110g

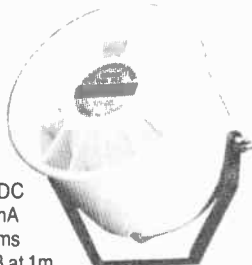
Order

YK59P (Small Electrnc Siren) £6.95

Low-Cost Electronic Siren

A compact electronic alarm siren, self-contained in a plastic housing with swivel mounting. Offers a low current drain.

Voltage: 12V DC
Current: 250mA
Impedance: 8 ohms
Sound output: 98dB at 1m
Case: Plastic with metal bracket
Size: 89mm dia x 60mm
Weight: 175g



Order

YK60Q (Low-Cost Electrnc Srn) £8.95

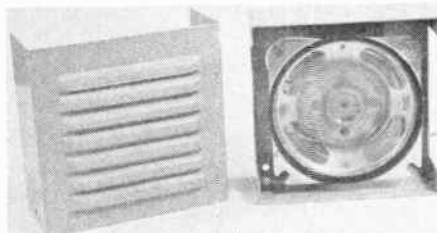
Electronic Siren

A powerful siren utilising solid state electronics to provide a warbler tone. The unit is housed in a buff-coloured enamelled steel case and is intended primarily for external use. The case is fully waterproof and is ideal for use with intruder alarm systems.

Supply voltage: 12V DC
Current drain: 500mA
Sound output: 104dB at 3m
Weight: 0.78kg
Dimensions: 102 x 102 x 45mm.

Order

XG14Q (Electronic Siren) £24.95



Staccato Electronic Sounder

A weatherproof electronic siren which is completely self contained. The unit has a high output combined with a low current consumption, making it ideal for use with intruder alarm systems.

The finish is in beige plastic with a metal fixing bracket.



Voltage: 6-12V DC
Current: 450mA max.
Sound output: 110dB at 1m (10 watts) min
Size: 127mm (5in) horn opening, 150mm length
Weight: 490g

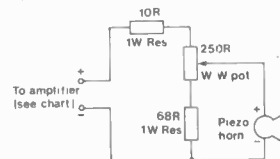
Order

YK61R (Staccato Electrnc Sdr) £11.95

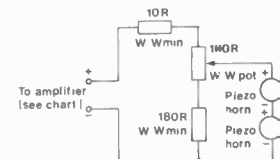
PIEZO ELECTRIC TWEETERS

These tweeters which can be added to any existing speaker system having not more than 200W power capability offer many advantages over ordinary (dynamic) tweeters. The elimination of the voice coil results in a very low dynamic mass in the driver which greatly improves the transient response of the speaker. The result is a beautifully clean sound with low distortion and a minimum of ringing. The piezo electric tweeter has a very high impedance (over 1000Ω at 1kHz and still over 20Ω at 40kHz) and thus presents no added load to the amplifier. It rejects low frequencies without needing a crossover network.

Connection details



Connection Diagram A



Connection Diagram B

Continued on next page.

Piezo Tweeters Continued

Impedance of existing speaker system	Amplifier rms power output (W)	Use circuit
4Ω	up to 100W	A
4Ω	up to 200W	B
8Ω	up to 200W	B
16Ω	up to 200W	B

The speaker is simply connected as shown on the previous page and the adjustment potentiometer is provided so that the tweeter output sound level can be made equal to the existing speakers. However, if adjustment after initial setting-up is not required then the pot could be removed and replaced by two 1W resistors having the nearest values to those measured on each side of the pot. If exceptionally loud treble output is required, one (in the case of system A) or two in series (in the case of system B) can be wired in parallel with the existing tweeter/s.

2 inch Direct Radiant Tweeter

This tweeter is ideal as the high frequency unit in three-speaker systems.



Average harmonic distortion:	<0.75%
Output sound level at 457mm from front of speaker with 4V rms pink noise input:	101.5dB
Frequency response:	4.8kHz to 20kHz ±3dB
Max continuous rms input voltage:	16V
Max peak music power:	35V
Overall diameter:	51mm
Overall depth:	18mm
Total width:	70mm
Fixing centres:	62mm
Panel cut-out:	48mm dia
Weight:	8gms

Order

YW52G (2in Piezo Tweeter) £3.15

3¾ inch Direct Radiant Tweeter

This tweeter is ideal for use in bookshelf speaker systems and smaller high fidelity speakers where it will greatly enhance the high frequency response.

Average harmonic distortion:	<0.75%
Output sound level at 457mm from front of speaker with 4V rms pink noise input:	100dB
Frequency response:	2.2kHz to 32kHz ±3dB
Max continuous rms input voltage:	16V
Max peak music power:	35V
Overall diameter:	95mm
Overall depth:	21mm
Fixing centres:	60 x 60mm
Panel cut-out:	60mm dia.
Weight:	36gms

Order

WF54J (Direct Radiant Piezo) £4.95

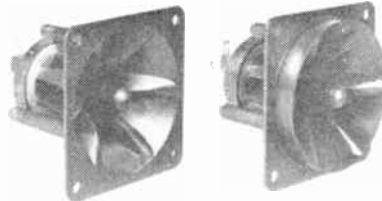
**PHONE NOW
0702 552911**



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Standard Horn

This tweeter is designed for general purpose use in high fidelity, disco & PA speakers of all sizes.



Average harmonic distortion:	1%
Output sound level at 457mm from front of speaker with 4V rms pink noise input:	103dB
Frequency response:	3.9kHz to 28kHz ±3dB
Max continuous rms input voltage:	16V
Max peak music power:	35V
Overall size:	85 x 85 x 70mm deep
Fixing centres:	71 x 71mm
Panel cut-out:	76mm dia
Weight:	63gms

Available in two types. With mounting flange flush with front of horn. With mounting flange recessed 12mm so that front of horn may be more nearly flush with front of baffle when mounted.

Order

WF09K (Piezo Horn Flush) £9.95
WF55K (Piezo Horn Recessed) £9.95

Wide Dispersion Horn

This tweeter is designed to give a wide dispersion pattern and is therefore ideal in stereo hi-fi systems and in high quality discos etc.



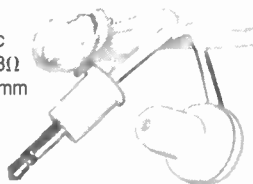
Average harmonic distortion:	0.5%
Output sound level at 457mm from front of speaker with 4V rms pink noise input:	104dB
Frequency response:	2kHz to 32kHz ±3dB
Max continuous rms input voltage:	20V
Max peak music power:	35V
Overall size:	178 x 83 x 108mm
Fixing centres:	86 x 86 x 63.5mm
Panel cut-out:	155 x 51mm
Weight:	130gms

Order

WF56L (Wide Angle Piezo) £12.95

EARPIECES Magnetic

A standard magnetic earpiece having an 8Ω impedance and 950mm of lead terminated in either a 2.5mm or 3.5mm jack plug.



Order

LB23A (Mag Earpiece 2.5mm) 30p
LB24B (Mag Earpiece 3.5mm) 25p

Crystal

A standard crystal earpiece with a very high impedance and 1m of lead terminated in a 3.5mm jack plug.



Order

LB25C (Crystal Earpiece) 62p

Stethoscope

A stethoscope attachment into which any of the above earpieces will fit. The sound may then be heard in both ears.



Order

YW57M (Stethoscope) 95p

HEADPHONES Stereo Headphone with Boom Microphone

NEW



A stereo dynamic headphone with adjustable headband and a dynamic microphone on an adjustable boom. The membrane type driver diaphragms are mounted in back vented plastic shells with foam padded ear pieces. The phones have 2.5 metres of cable terminated in a standard ¼in. stereo jack plug with strain relief sleeve. The microphone can be detached if required, and is fitted with 2.5 metres of cable terminated in a mono ¼in. jack plug with strain relief.

Headphones

Impedance:	32Ω
Sensitivity:	95dB/mW
Frequency response:	20Hz - 20kHz
Nominal input:	1mW
Max input:	100mW

Microphone

Impedance:	500Ω
Sensitivity:	-82dB (56mV)
Frequency response:	200Hz - 5kHz

Order

YJ85G (Stereo Mic Hdphone) £16.95

Stereo Headphone

NEW



A light-weight stereo headphone ideal for use with 'Walkman-type' cassette players and radios. The headphone has ferrite magnet drive units and a 1.2m cord terminated in a stereo 3.5mm jack plug. The metal headband is adjustable.

Specification

Drive unit:	28mm dia ferrite
Impedance:	32Ω
Frequency response:	20Hz to 20kHz
Sensitivity:	92dB at 1kHz
Input power:	100mW max
Weight:	33g plus cord

Order

YM38R (Low-cost Stereophone) £3.95

Stereo Headphone with Adjustable Phones NEW



A light-weight stereo headphone with the phones mounted on pivots so that they adjust to the ear to give better contact and therefore enhanced bass response and are more comfortable than non-adjustable types. The headphone has ferrite magnet drive units and a 1.2m cord terminated in a stereo 3.5mm jack plug. The metal headband is also adjustable.

Order

YM39N (Adjustable Sterophone) £4.95

Stereo Headphone Inner Ear Type NEW



A stereo headphone with very small phones which lie directly in the ear. Supplied with a headband which holds them in place if the shape of your ear does not allow them to hold in naturally, or to increase the contact pressure and thus enhance the bass response. The headphone has ferrite magnet drive units and a 1.2m cord terminated in a stereo 3.5mm jack plug. The metal headband is adjustable.

Order

YM40T (InnerEar Stereophone) £4.95

Samarium Cobalt Stereo Headphone NEW



A light-weight stereo headphone with samarium cobalt magnet drive units offering superb audio quality. The 1.2m cord is terminated in a 3.5mm stereo jack plug. The metal headband is adjustable. Suitable for 8Ω systems.

Order

YM41U (SC Stereophone) £5.95

Samarium Cobalt Stereo Headphone with Adjustable Phones NEW



A light-weight stereo headphone with samarium cobalt magnet drive units offering superb audio quality. The phones are mounted on pivots so that they adjust to the ear to give better contact and therefore enhanced bass response and are more comfortable than non-adjustable types. The 1.2m cord is terminated in a 3.5mm stereo jack plug and the metal headband is adjustable.

Order

YM42V (SC Adjust Sterophone) £6.95

Large Samarium Cobalt Stereo Headphone NEW



A light-weight stereo headphone with samarium cobalt magnet drive units with a larger 34mm diameter offering superb audio quality and extended frequency response. The 1.2m cord is terminated in a 3.5mm stereo jack plug and the metal headband is adjustable. Suitable for 8Ω systems.

Order

YM43W (SC Xtd Freq Sterophn) £8.95

Stereo Headphone with Volume Control NEW



A light-weight stereo headphone with samarium cobalt magnet drive units offering superb audio quality. Each phone has its own slide volume control. The 1.2m cord is terminated in a 3.5mm stereo jack plug and the metal headband is adjustable. Suitable for 8Ω systems.

Order

YM44X (SC Vcntrl Sterophon) £12.95

Headphone Adaptor



A very useful unit which allows one or two pairs of headphones to be used alone or simultaneously with speakers whilst maintaining correct matching of impedance under all conditions. Supplied with two 950mm leads connected to DIN loudspeaker 2-pin plugs. Body has two 2-pin DIN sockets in it, into which loudspeakers plug. Two stereo jack sockets are provided for two pairs of headphones. A three position slide switch is provided which gives headphone/s only or speakers only or both headphones and speakers together. Overall size: 55 x 85 x 39mm high.

Order

LB13P (Headphone Adaptor) £3.45

Personal Stereo Headphone Branch Adaptor



A single to three way output splitter allowing up to three sets of headphones to be sourced from one personal stereo cassette player. The unit has thumb-wheel type level controls for Left and Right channels, and a Mono/Stereo switch. It accepts 3.5mm stereo jack plugs, and has a generous 2.4m of straight lead fitted terminated with one 3.5mm stereo jack plug. The unit measures 55 x 48 x 17mm, and weighs a mere 30 grams less lead (55 grams with lead). Impedance 100Ω.

Order

FM39N (3-Way H/Phone Adapt) £5.35

MINIATURE LOUDSPEAKERS

A range of miniature loudspeakers designed as replacements for use in transistor radios, but ideal for all sorts of projects where a small transducer is required.



Type	Size (dia)	Overall depth	Impedance	Rating
388	38mm	16mm	8Ω	0.1W
458	45mm	16mm	8Ω	0.1W
508	50mm	18mm	8Ω	0.2W
568	56mm	20mm	8Ω	0.2W
668	66mm	22mm	8Ω	0.3W
64Ω	66mm	22mm	64Ω	0.3W
768	76mm	24mm	8Ω	0.5W

Order

WB04E (L/S Lo-Z 388)	95p
WB05F (L/S Lo-Z 458)	95p
WB08J (L/S Lo-Z 508)	98p
WB09K (L/S Lo-Z 568)	98p
WB13P (L/S Lo-Z 668)	98p
WF57M (Hi-Z L/S 64R)	£1.15
YW53H (L/S Lo-Z 768)	99p

Specifications

	YM39N	YM40T	YM41U	YM42V	YM43W	YM44X
Drive unit	24mm	14mm	28mm	24mm	34mm	28mm
Impedance	32Ω	32Ω	20Ω	32Ω	20Ω	20Ω
Frequency response	20Hz to 20kHz	50Hz to 20kHz	20Hz to 20kHz	20Hz to 20kHz	20Hz to 22kHz	20Hz to 22kHz
Sensitivity	90dB at 1kHz	100dB at 1kHz	98dB at 1kHz	98dB at 1kHz	100dB at 1kHz	100dB at 1kHz
Input power (max)	100mW	30mW	100mW	100mW	100mW	100mW
Weight (excl. cord)	44g	5g	30.4g	35g	38g	44g

★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

TWEETERS

15W Standard Tweeter



A high power standard tweeter with 76mm (3in) diameter cone.

Frequency response: 2kHz to 19kHz
 Power handling: 15W
 Impedance: 8Ω (suitable for 4 to 8Ω systems)
 Dimensions: Baffle cut-out: 75mm dia
 Fixing centres: 71 x 71mm
 Overall size: 107mm dia. x 29mm deep

Crossover point: ≥3kHz

Order

YW54J (15W Cone Tweeter) £4.25

Multi-Cellular Horn Tweeter



A horn tweeter with a multi-cellular front to aid dispersion of the high frequencies which tend to be very directional.

Frequency response: 3kHz to 18kHz
 Power handling (max): 30W rms
 Impedance: 8Ω (suitable for 4 to 8Ω systems)
 Mounting Plate dimensions: 137 x 80mm
 Baffle cut-out: 120 x 60mm
 Overall depth (front to back): 92mm
 Crossover point: ≥3kHz

Order

WF24B (Multi-Cell Tweeter) £7.95

Horn Tweeter



A free standing or baffle mounting horn tweeter.

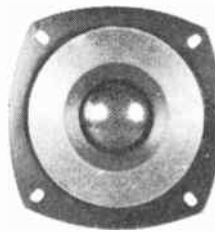
Frequency response: 3kHz to 20kHz
 Power handling (max): 30W rms
 Impedance: 8Ω (suitable for 4 to 8Ω systems)
 Dimensions: Baffle cut-out: 60mm dia
 Fixing centres: 50 x 50mm x 2BA
 Mounting plate: 64 x 64mm
 Overall depth (front to back): 91mm

Crossover point: ≥3kHz

Order

WF33L (Free Stand Tweeter) £6.95

Dome Tweeter



A slim dome tweeter with a heavy duty ceramic magnet.

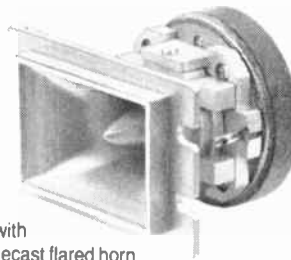
Frequency response: 2kHz to 20kHz
 Power handling (max): 50W
 Impedance: 8Ω (suitable for 4 to 8Ω systems)
 Dimensions: Baffle cut-out: 78mm dia
 Fixing centres: 68 x 69mm x 4BA (M4)
 Mounting plate: 96 x 96mm
 Overall depth: 31mm

Crossover point: 4.5kHz approx.

Order

WF43W (Dome Tweeter) £5.95

Rectangular Tweeter



A rectangular shaped tweeter with silver coloured diecast flared horn.

Frequency response: 5kHz to 20kHz
 Power handling (max): 80W peak
 Impedance: 8Ω (suitable for 4 to 8Ω systems)
 Dimensions: Baffle cut-out: 63 x 43mm
 Fixing centres: 75 x 21mm x 4BA (M4)
 Mounting plate: 85 x 53mm

Crossover point: 7.5kHz (approx)

Order

WF44X (Rectangular Tweeter) £4.95

50W Bullet Tweeter

A high quality high frequency transducer with a substantially level frequency response from 5kHz to 25kHz, in a cast alloy body with a brushed finish front mounting flange and centre 'bullet'. A high quality tweeter for domestic hi-fi and all other music systems.



Specification:

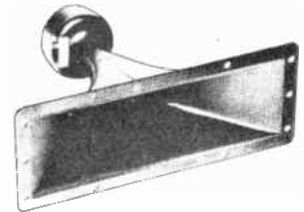
Flux density: 11,500 Gauss
 Freq range: 5kHz to 40kHz
 System Power Rating: 50W using HPX2 crossover
 Unit Power Rating: 30W continuous rms
 Impedance: 8Ω
 Acoustic output: 96dB (sensitivity 1W @ 1 metre)
 Crossover freq: 5kHz min @ 18dB/octave
 Overall diameter: 98mm
 Overall depth: 45.5mm
 Fixing centres: 4 x 84mm x 5mm clear
 Overall weight: 490gm (17ozs)

Order

YJ01B (Tweeter 50W 8R) £17.95

70W Horn Tweeter

A rectangular version of the above, having a solid cast body 7¼in by 3in, with a ten hole fixing. It is a rectangular horn tweeter which disperses its sound output on a lateral plane, and has a horn cut-off frequency fixed at 820Hz, although the lowest input frequency should be double this to maintain efficiency.



Specification:

Flux density: 9000 Gauss
 Frequency range: 1.7kHz to 17kHz
 System power rating: 70W using HPX2 crossover
 Unit power rating: 50W
 Impedance: 8Ω
 Acoustic output: 97dB (sensitivity 1W @ 1m)
 Crossover frequency: 1.7kHz min
 Overall width x height: 184 x 76mm
 Overall depth: 164mm
 Fixing centres: 10 x 35mm + 35mm x 64 + 127 + 64mm, x 5mm clear
 Overall weight: 605gm

Order

YJ02C (Tweeter 70W 8R) £19.95

CROSSOVER NETWORKS HPX2 Crossover



A two-way crossover with a 12dB/octave high pass filter operating at 5kHz. Power handling capability up to 200 watts. Ideal for use with our 50W Bullet and 70W Horn Tweeters.

Order

YJ03D (Crossover HPX2) £7.75

Two-way



A cross-over network for operating a woofer and a tweeter together. Components are mounted on a plastic panel (124 x 100mm) for fixing inside a cabinet. Power handling: 40W rms. Cross-over is at approx. 3kHz (12dB/octave).

Order

WF02C (Crossover 2-Way) £4.20

Three-way



A cross-over network for operating a woofer, tweeter and mid-range speaker together. Components are mounted on a plastic panel (124 x 100mm) for fixing inside a cabinet. Power handling: 60W rms. Crossovers are at approx. 500Hz (6dB/octave) and 4kHz (12dB/octave).

Order

WF03D (Crossover 3-Way) £5.75

Three-way Controlled

A three-way crossover network mounted on a flat panel with volume controls for the mid-range speaker and the tweeter. Black anodised finish with silver lettering and spring-loaded red and black terminals.



Nominal impedance: 8Ω (suitable for 4 to 8Ω systems)
 Crossovers: 1kHz (6dB/octave)
 6kHz (6dB/octave)
 Power handling: 40W rms
 Dimensions: Fixing centres: 133 x 114 x 6BA (M3)
 Front plate: 150 x 130mm
 Overall depth: 50mm

Order

WF46A (Controlled Crossover) £13.45

SPEAKER GRILLES

Plastic Car Type

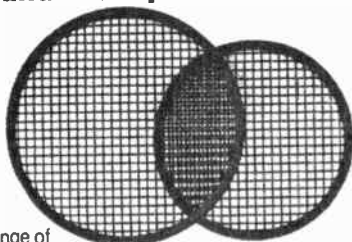
Speaker grilles for car door mounting standard 4in round speakers. Speaker fixing 84 x 84mm. Plastic type only available. Grilles have separate fixing holes on 119 x 119mm centres. Overall size: 140 x 140 x 13mm.



Order

YW55K (Plastic Car Grille) £1.10

Round Loudspeaker Grilles



A range of protective, circular metal grilles to complement the Big Cat range of speakers. The grilles are finished in matt black and have a PVC covering strip around the edge. Fitting is by loudspeaker fixing clamps, (e.g. FJ40T). Available in the following sizes: 5, 8, 10, 12, 15 and 18 inches diameter.

Order

FJ38R (5in Speaker Grille) £1.89
FJ39N (8in Speaker Grille) £2.85
YK71N (10in Speaker Grille) £2.98
YK72P (12in Speaker Grille) £3.95
YJ04E (15in Speaker Grille) £5.75
YJ05F (18in Speaker Grille) £8.75

Loudspeaker Fixing Clamp

A fixing clamp suitable for speakers of 10, 12 and 15 inch dimensions. Made from tough moulded plastic, fixing is by nut and bolt. When clamping down, the fixing clamp bends slightly to give the fixture a high degree of resilience.



Order

BK30H (Spkr Fixing Clamp) 38p

Metal Speaker Clamping Kit



A sturdy loudspeaker clamping kit comprising 4 1/4in Whitworth bolts 38mm long, 4 T-nuts and 4 clamps in 3mm thick zinc plated steel. The kit may be used without the clamps to fix 10 or 12 inch speakers to the front or the rear of a baffle using the holes in the speaker chassis. If rear mounting, the bolts may have to be cut short with a hacksaw if they protrude too much through to the front. Put a nut on first before sawing, then removing the nut will clean up the end of the thread as it is unscrewed. The T-nuts require holes in the baffle of 3/8in clearance into which they can be tapped home lightly with a hammer. Alternatively the speaker chassis can be gripped on four points around the edge by the right-angled clamps, using the bolts and T nuts in a 'stand off' position from the chassis. The clamps are 42mm long x 19mm wide, and have a 10.5mm deep fulcrum.

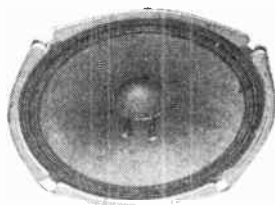
Order

FJ40T (Speaker Clamp Kit) £1.95

LOUDSPEAKERS

Low-Cost Round Speakers

Low-cost speakers suitable for use in larger transistor radios, small car systems etc.



Impedance: 4Ω or 8Ω
 Power handling: 2.5W r.m.s
 Dimensions: Baffle cut-out: 110mm dia
 Fixing centres: 85 x 85mm x 2BA (M5)
 Overall size: 120 x 120mm
 Overall depth: 40mm

Order

WF47B (Low-Cost 4in Spkr 4R) £1.98
YJ16S (Low Cost 4in Spkr 8R) £1.98

Heavy Duty Car Speaker



A 5 1/4in round speaker ideally suited for car stereo speakers and as a direct replacement in many commercial types. The speaker has a ceramic magnet and its impedance is 8Ω, making it suitable for 4 to 8Ω outputs.

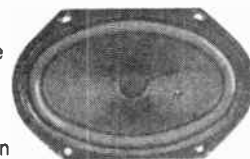
Power handling: 10W rms
 Overall size: 133 x 133mm
 Overall depth: 53mm
 Fixing centres: 97 x 97mm

Order

WF48C (Hvy Duty Car Spkr) £4.95

Elliptical Speakers

A range of high quality loudspeakers. All have high flux density ceramic magnets that give a very wide frequency response when the speaker is mounted on a baffle or in an enclosure. All types are 8Ω impedance and are suitable for 4 to 8Ω outputs.



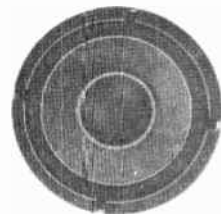
Size Cone	6 x 4in. Standard	7 x 4in. Standard	8 x 5in. Twin cone	8 x 5in. long throw
Frequency response	130Hz to 10kHz	130Hz to 10kHz	100Hz to 13kHz	45Hz to 16kHz
Power (rms)	4W	4W	5W	8W
Flux density (gauss)	8000	7500	7500	9000
Overall size mm (l x w x d)	156 x 104 x 41	179 x 105 x 47	203 x 127 x 55	203 x 127 x 64
Fixing centres	116 x 91	93 to 118 (slot)	108 x 108mm	108 x 108mm
Type	CM641	CM742	CM852	LT853

Order

WF50E (Elliptical Spkr CM641) £2.95
WF18U (Elliptical Spkr CM742) £3.95
WF23A (Elliptical Spkr CM852) £4.95
WY13P (Elliptical Spkr LT853) £5.95

Round Speakers

A range of high quality loudspeakers. All have high flux density ceramic magnets that give a very wide frequency response when the speaker is mounted on a baffle or in an enclosure. All types are 8Ω impedance and are suitable for 4 to 8Ω outputs.



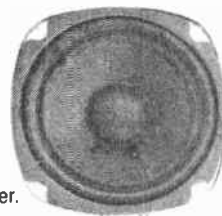
Size Cone	5in. Twin cone, long throw	6 1/2in. Long throw	8in. Twin cone, long throw	8in. Twin cone, long throw
Frequency response	50Hz to 15kHz	50Hz to 12kHz	40Hz to 18kHz	30Hz to 20kHz
Power (rms)	15W	12W	15W	25W
Flux density (gauss)	11,000	9000	9500	12,000
Overall size dia x depth (mm)	Square frame 130 x 76	166 x 68	205 x 86	205 x 84
Fixing centres	99 x 99	110 x 110	139 x 139	139 x 139
Type	LT530	LT650	LT830	LT840

Order

WF00A (Rd Speaker LT530) £8.95
YJ17T (Rd Speaker LT650) £7.95
WF11M (Rd Speaker LT830) £7.95
WF12N (Rd Speaker LT840) £9.95

Mid-range Speakers

High quality mid-range speakers for use in three-way speaker systems. Both 5" diameter. Impedance 8Ω.

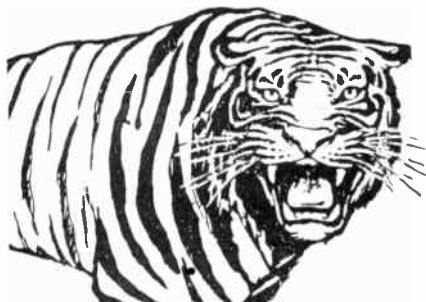


Use in systems up to	20W	40W
Frequency response	850 to 7000Hz	500 to 8000Hz
Flux density (gauss)	7000	8500
Overall size (diameter x depth)mm	130 x 47	130 x 50
Fixing centres	84 x 84mm	84 x 84mm
Type	20W Squawker	40W Squawker

Order

WF53H (20W Squawker) £3.95
WY15R (40W Squawker) £5.45

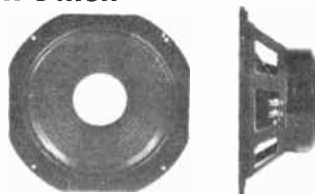
HIGH POWER LOUDSPEAKERS



BIG CAT

Big Cat is an exciting range of super-quality, high power loudspeakers designed to the most demanding professional standards by Europe's leading audio laboratories, and manufactured exclusively for Maplin. Big Cat loudspeakers combine high power capability and great electrical strength with a quality of sound that would satisfy all but the most stringent of hi-fi standards. All models feature a virtually indestructible high temperature voice coil reinforced with glass-fibre, having a minimum 100% heat overload tolerance. Latest advances in magnet system technology ensure uniformly high levels of output efficiency. Mechanical construction comprises a rigid, cast alloy chassis with provision for mounting onto the front or the rear of the front baffle. The 12 inch and 15 inch models have additional fixing holes to cater for both European and US fitting dimensions. Cone suspension is either a low resonance linen surround, or Plastiflex elastomer for long life and minimal chance of fatigue failure. All models are finished in a durable black stoved enamel and are guaranteed for 5 years in addition to your statutory rights. The Big Cat range includes specialised as well as wide range models for every conceivable application; the exceptional efficiency and comprehensive mounting facilities of the Big Cat range make it particularly suitable for upgrading the performance of existing equipment. A booklet on Loudspeaker Cabinet Design and Construction can be found in the books section of this catalogue.

50W 5 inch



A very compact, wide-range high-power driver, suitable for In Car Entertainment and all types of miniature sound reproducing systems. Can also be used in multiple unit Public Address and Stage arrays.

Specification

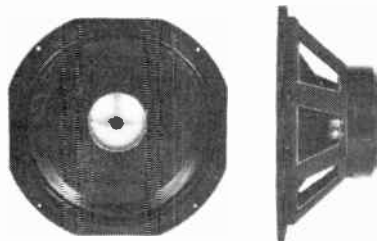
Flux Density: 14,000 Gauss
 Total Flux: 56,000 Maxwells
 Frequency Response: 65Hz to 18kHz
 Power Handling: 50W continuous rms
 Impedance: 8 or 16Ω
 Coil Diameter: 25mm (1in)
 Chassis Diameter: 118mm (4⁵/₁₆in)
 Fixing Centres: 140 x 140mm, 5.5mm clear (5¹/₂in)
 Baffle Cut-out: 400mm (4in)
 Free Air Resonance: 60Hz
 Acoustic Output: 95dB (sensitivity 1W @ 1 metre)

Order

XG39N (Speaker 5in 50W 8R) £17.95
 XG40T (Speaker 5in 50W 16R) £17.95

50W 8 inch

A semi-compact, high power driver, with Plastiflex cone surround and an alloy presence dome. A general purpose speaker suitable for all forms of domestic and club music systems, or for Public Address both in single or multiple arrays. Also for guitar practice amplifiers.



Specification

Flux Density: 14,000 Gauss
 Total Flux: 56,000 Maxwells
 Frequency Response: 60Hz to 8kHz
 Power Handling: 50W continuous rms
 Impedance: 8 or 16Ω
 Coil Diameter: 25mm (1in)
 Chassis Diameter: 184mm (7¹/₄in)
 Fixing centres: 212 x 212mm, 5.5mm clear (8.375in)
 Baffle cut-out: 170mm (6³/₄in)
 Free Air Resonance: 60Hz
 Acoustic Output: 96dB (sensitivity 1W @ 1m)

Order

XG41U (Speaker 8in 50W 8R) £24.95
 XG42V (Speaker 8in 50W 16R) £24.95

100W 8 inch

A semi-compact, extra high output driver for general purpose applications for all forms of domestic and club music systems, and Public Address, both singly or in multiples. Suitable for lead guitar, and can be used in multiples for bass guitar.

Specification

Flux Density: 14,300 Gauss
 Total Flux: 112,000 Maxwells
 Frequency Response: 60Hz to 6.5kHz
 Power Handling: 100W continuous rms
 Impedance: 8Ω
 Coil Diameter: 38mm (1¹/₂in)
 Chassis Diameter: 184mm (7¹/₄in)
 Fixing Centres: 212 x 212mm, 5.5mm clear (8.375in)
 Baffle Cut-out: 170mm (6³/₄in)
 Free Air Resonance: 50Hz
 Acoustic Output: 98dB (sensitivity 1W @ 1m)

Order

XG43W (Speaker 8in 100W 8R) £29.95

50W Twin Cone 10 inch

A high quality, dual cone, wide-range speaker suitable for domestic and club music systems, P.A. and vocals, keyboard instruments and compact disco equipment.

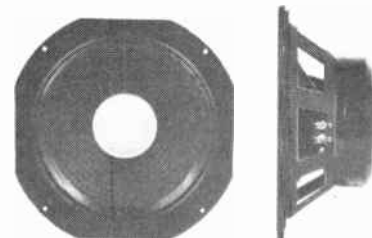
Specification

Flux Density: 11,500 Gauss
 Total Flux: 90,000 Maxwells
 Frequency Response: 50Hz to 14kHz
 Power Handling: 50W continuous rms
 Impedance: 8 or 16Ω
 Coil Diameter: 38mm (1¹/₂in)
 Chassis Diameter: 256mm (10¹/₈in)
 Fixing Centres: 270 x 270mm, 5.5mm clear (10.265in)
 Baffle Cut-out: 228mm (9in)
 Free Air Resonance: 60Hz
 Acoustic Output: 97dB (sensitivity 1W @ 1m)

Order

XG44X (Spkr 10in 50W TC 8R) £26.95
 XG45Y (Spkr 10in 50W TC 16R) £26.95

100W General Purpose 10 inch



A high quality, extra high output general purpose speaker for domestic and club systems, Public Address and vocals, keyboards and lead guitar. Especially suitable for use in multiples for bass guitar and compact disco systems.

Specification

Flux Density: 12,750 Gauss
 Total Flux: 125,750 Maxwells
 Frequency Response: 70Hz to 6kHz
 Power Handling: 100W continuous rms
 Impedance: 8Ω
 Chassis dia: 259mm (10¹/₈in)
 Fixing Centres: 270 x 270mm, 5.5mm clear (10.625in)
 Baffle Cut-out: 228mm (9in)
 Free Air Resonance: 80Hz
 Acoustic Output: 100dB (sensitivity 1W @ 1 metre)

Order

XG46A (Spkr 10in 100W GP 8R) £29.95

50W General Purpose 12 inch

High quality general purpose loudspeaker for lead guitar, Public Address, discotheques and club music systems. Features an alloy presence dome for an enhanced treble response.

Specification

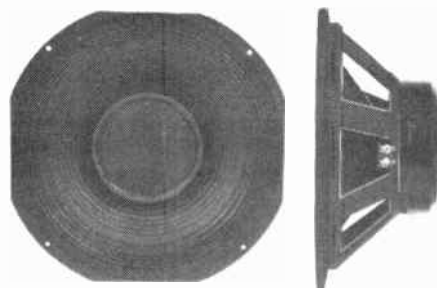
Flux Density: 11,500 Gauss
 Total Flux: 90,000 Maxwells
 Frequency Response: 60Hz to 5.5kHz
 Power Handling: 50W continuous rms
 Impedance: 8 or 16Ω
 Coil Diameter: 38mm (1¹/₂in)
 Chassis Diameter: 308mm (12¹/₈in)
 Fixing Centres: 318 x 318mm, 5.5mm clear (12¹/₂in)
 Baffle cut-out: 280mm (11in)
 Free Air Resonance: 70Hz
 Acoustic Output: 99dB (sensitivity 1W @ 1 metre)

Order

XG47B (Spkr 12in 50W GP 8R) £26.95
 XG48C (Spkr 12in 50W GP 16R) £26.95

100W General Purpose 12 inch

A high quality bass driver also suitable for general purpose applications, and featuring a Plastiflex cone surround. Can be used for lead and bass guitar, and also as the bass unit in multiway systems.



Specification

Flux Density: 14,000 Gauss
 Total Flux: 145,000 Maxwells
 Frequency Response: 65Hz to 6kHz
 Power Handling: 100W continuous rms

Impedance: 8Ω
 Coil Diameter: 51mm (2in)
 Chassis Diameter: 308mm (12½in)
 Fixing Centres: 318 x 318mm,
 5.5mm clear (12½in)
 Baffle Cut-out: 280mm (11in)
 Free Air Resonance: 75Hz
 Acoustic Output: 101dB (sensitivity
 1W @ 1 metre)

Order

XG49D (Spkr 12in 100W GP 8R)..... £29.95

100W Twin Cone 12 inch

A super high quality full-range dual cone loudspeaker with a low resonance linen cloth surround. The ultimate transducer for domestic hi-fi, discothèques and Public Address, keyboard instruments and stage monitors.

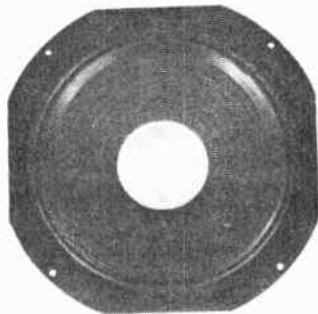
Specification

Flux Density: 14,000 Gauss
 Total Flux: 145,000 Maxwells
 Frequency Response: 50Hz to 13kHz
 Power Handling: 100W continuous rms
 Impedance: 8 or 16Ω
 Coil Diameter: 51mm (2in)
 Chassis Diameter: 308mm (12½in)
 Fixing Centres: 318 x 318mm,
 5.5mm clear (12½in)
 Baffle Cut-out: 280mm (11in)
 Free Air Resonance: 50Hz
 Acoustic Output: 100dB (sensitivity
 1W @ 1 metre)

Order

XG50E (Spkr 12in 100W TC 8R) £34.95
XG51F (Spkr 12in 100W TC16R)..... £34.95

100W 15 inch



A robust high performance bass driver, with a low resonance linen cone surround and optimised radial fibre reinforced cone. Ideal for all bass applications and musical instrument bass up to 100 watts.

Specification

Flux Density: 14,000 Gauss
 Total Flux: 145,000 Maxwells
 Frequency Response: 50Hz to 6.5kHz
 Power Handling: 100W continuous rms
 Impedance: 8Ω
 Coil Diameter: 51mm (2in)
 Chassis Diameter: 390mm (15½in)
 Fixing Centres: 370 x 370mm,
 5.5mm clear (15½in)
 Baffle Cut-out: 352mm (13.9in)
 Free Air Resonance: 45Hz
 Acoustic output: 100dB (sensitivity
 1W @ 1 metre)

Order

XG52G (Spkr 15in 100W 8R) £39.95

200W 15 inch

An extra heavy duty, high performance bass driver with a 3in dia. glass-fibre reinforced voice coil, low resonance linen cone surround and optimised reinforced fibre cone. For all forms of bass usage up to 200 watts.

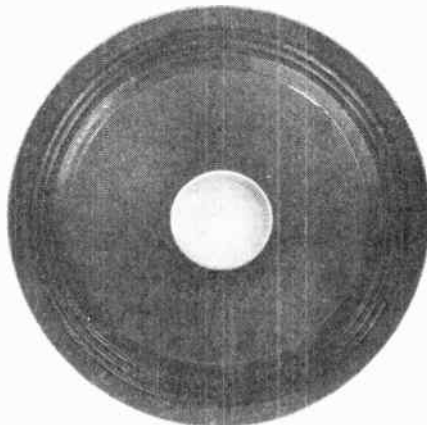
Specification

Flux Density: 11,750 Gauss
 Total Flux: 273,000 Maxwells
 Frequency Response: 40Hz to 5kHz
 Power Handling: 200W continuous rms
 Impedance: 8Ω
 Coil Diameter: 76mm (3in)
 Chassis Diameter: 390mm (15½in)
 Fixing Centres: 394 x 394mm,
 5.5mm clear (15½in)
 Baffle Cut-out: 352mm (13.84in)
 Free Air Resonance: 55Hz
 Acoustic Output: 101dB (sensitivity
 1W @ 1 metre)

Order

XG53H (Spkr 15in 200W 8R)..... £52.95

300W 18 inch



A no-compromise fundamental deep bass driver, having a low resonance linen surround, optimised long fibre, reinforced cone and a 3in glass-fibre reinforced voice coil. A professional quality speaker ideal for augmenting the deep bass in high quality disco systems, also for the stage, Public Address, etc.

Specification

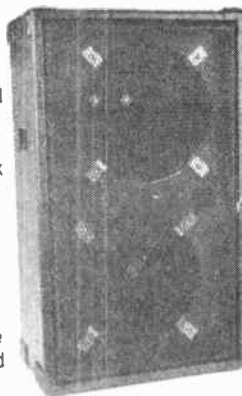
Flux Density: 11,750 Gauss
 Total Flux: 273,000 Maxwells
 Frequency Response: 30Hz to 3.8kHz
 Power Handling: 300W continuous rms
 Impedance: 8Ω
 Coil Diameter: 76mm (3in)
 Chassis Diameter: 458mm (18in)
 Fixing Centres: 438mm x 438mm, 8 off,
 8.8mm clear (17¼in)
 Free Air Resonance: 35Hz
 Acoustic Output: 99dB (sensitivity
 1W @ 1 metre)

Order

XG54J (Spkr 18in 300W 8R) £84.95

HIGH POWER LOUDSPEAKER CABINET Two Twelve

Heavy duty speaker cabinet finished in hard wearing black vinylite with carrying handles inset and a smart black grille cloth. Speakers are loaded from the front to ensure a perfect seal once the speakers are fitted. The cabinets are not lined internally and the sound can be improved by lining the cabinets with our Acoustic



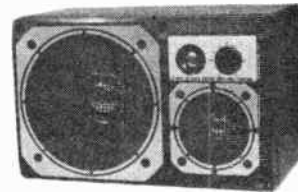
Wadding described on page 73. The baffle is cut out to accept two twelve inch speakers which are fixed with clamps supplied with cabinet. There are also two cut-outs for Direct Radiant Tweeters (60mm 2½in dia). Internal volume: 4400 cu. in. (approx). Overall size: 450mm wide, 280mm deep, 780mm high. To load speakers, lever out front grille.

Order

XB28F (Power L/S Cabinet)..... £54.95

Delivery by Carrier. By mail-order please add carriage charge £5.50.

MINI SPEAKER SYSTEM



A very attractive high quality 3-way speaker system in a very small cast aluminium cabinet. The woofer is a 4 inch unit with a 10oz ferrite magnet, the mid-range is a 2½ inch unit with a 1oz ferrite magnet and the tweeter is a 1 inch unit with a 0.35oz alnico magnet. The cabinet is finished in matt black with a simulated brushed aluminium and black facia.

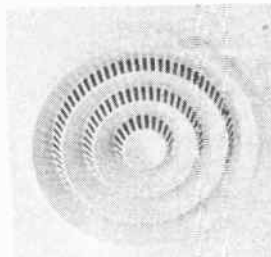
Impedance: 8Ω
 Power handling: 30W rms
 Frequency response: 50Hz to 20kHz

A brilliance control is fitted that attenuates the volume of the tweeter. Overall size: 190 x 115 x 105mm. Supplied only in matched pairs.

Order

AF33L (Mini Speaker System)..... £59.95

CEILING SPEAKER

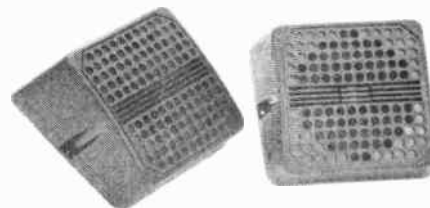


A speaker for use on a 100V line and fixed to a plastic panel for ceiling mounting. The transformer is tapped for 0.5W, 1W, 2W and 4W. The speaker is an 8in round type and the plastic tile is moulded to give a wide dispersion. Dimensions: Tile size: 253 x 253 x 23mm. Overall depth behind tile: 68mm. Weight: 1.2kg.

Order

XY79L (Ceiling Speaker) £1.95

CAR STEREO SPEAKERS 5W Shelf Mounting Type

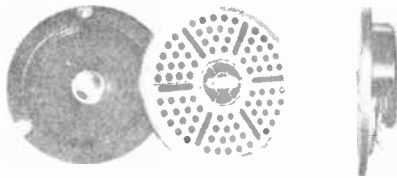


A pair of 4in Round Speakers each in a smart black plastic case for rear shelf fixing. Power handling 5W. Impedance 8Ω. Sold only in pairs.

Order

XB44X (Car Speakers Shelf)..... £5.95

5W Door Mounting Slim-Line Type

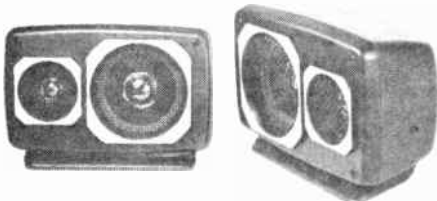


Super thin single cone 4in speaker. Metallic silver grille features built in dust filter. Thin construction allows for easy fixing to fit slim car door. Complete with water protectors. Nominal power 5W rms. Max. power 10W. Impedance 4Ω. Max. depth 37mm. Sold only in pairs.

Order

XG26D (Slim Line Car Spkrs) £11.95

10W Shelf Mounting Type

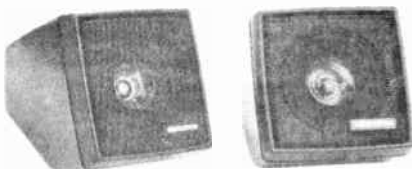


A pair of shelf mounting car speakers. Each unit has two speakers; a 76mm (3in.) air suspension unit with visible blue foam surround and a 48mm (2in.) tweeter, mounted in a matt black fully enclosed rectangular pod with satin chrome finish around the speakers and an attractive black see-through mesh over the speakers. Pod swivels through over 90° on mounting bracket. Nominal power 10W rms. Max power 20W. Impedance 4Ω. Ready-wired with 2.75m lengths of twin colour-coded speaker wire. Sold only in pairs. Overall size: 173 x 108 x 76mm. Fixing centres: 90mm x 2BA

Order

XY73Q (10W Shelf Spkrs) £22.95

15W Shelf Mounting Type



A pair of shelf mounting speakers. These speakers are capable of exceptional power and quality for their size, making them ideal for mounting in hatchback cars where space can be limited. The speakers are dual cone air suspension type, and have an impedance of 4Ω. Nominal power 15W. Max. power 30W. They come complete with mounting kit and two lengths of twin colour-coded speaker wire. Sold only in pairs. Overall size: 100 x 100mm.

Order

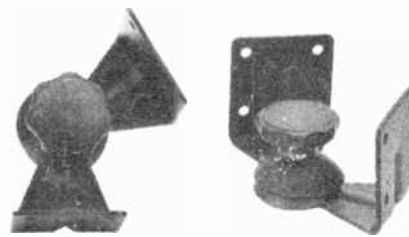
XG27E (15W Shelf Speakers) £19.95

LOUDSPEAKER MOUNTING BRACKETS

The ideal way to fit your speakers to the wall simply and reliably. After fixing, the speakers can be adjusted to face in any direction vertically and horizontally. Three types of bracket are available. Sold only in pairs.

5kg Wallbracket

This bracket is suitable for loads up to 5kg (11lbs).
Horizontal scan: 90° to 180°
Vertical scan: 0° to 30°

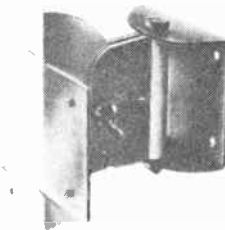


Finish: Matt black
Dimensions: 50 x 50 x 100mm

Order

YL15R (5kg Wallbracket) £9.95

25kg Wallbracket



This bracket is suitable for loads up to 25kg (55lbs)

Horizontal scan: 150°
Vertical scan: 0° to 43°
Finish: Matt black
Dimensions: 160 x 110 x 120mm

Order

YL16S (25kg Wallbracket) £15.95

Wallclamps



A bracket which eliminates the need to screw directly to the speaker as they are held by rubber coated discs. Suitable for loads of up to 20kg (44lbs)

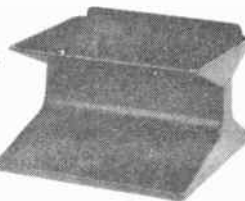
Horizontal scan: Up to 180°
Vertical scan: —
Finish: Matt black
Distance from pivot to wall: 14cm (5 1/4in)

Order

YK54J (Wallclamps) £15.95

VDU/Speaker Stands

A smart matt black stand to carry a table top VDU. The stand is moulded in ABS plastic, and can be tilted from 0 degrees through to 5 degrees from the vertical axis. Supports the VDU approximately 6 inches above the working surface on a 25cm x 21cm platform. Might also be used in pairs for carrying small Hi Fi loudspeakers.



Dimensions: Height: 15cm
Width: 25cm
Depth: 21cm
Weight: 665gms (22.75 ozs)

Order

YK84F (VDU Stand) £15.95

MEGAPHONE Pistol Grip Megaphone



A high quality megaphone with pistol-grip for hand-held use. It contains a powerful solid-state amplifier and re-entrant horn speaker giving crisp, clear reproduction. A differential microphone is attached via a curly lead and an on-off switch and volume switch are incorporated in the hand-held microphone moulding. The megaphone is housed in a smart maroon and light-grey material body. Supplied with instructions. Eight HP11 batteries are required (not supplied) to give 12V DC. Max. output is approx. 15W but this is very penetrating and can be clearly heard up to 0.5 to 1km away depending on ambient sound level. Size: 240 x 230mm diq. Weight: 1.6kg.

Order

XY76H (Pistol Grip Megaphone) £74.95

CAR-TOP PA SPEAKERS 8 Watt

A weather-proofed horn speaker with bracket for bolting to car roof or to a bracket across car roof etc. For maximum dispersion, four of these units mounted at right angles to one another will be found more efficient than one large speaker since they are fairly directional. The mounting bracket is adjustable and the whole unit is in white plastic.

Nominal power: 8W
Impedance: 8Ω
Horn diameter: 137mm



Order

XQ73Q (Car PA 8W) £8.95

15 Watt

A weather-proofed horn speaker with bracket for bolting to car roof or to a bracket across car roof etc. For maximum dispersion two or more of these units mounted in opposing directions will be found far more efficient than one large speaker since they are fairly directional. The mounting bracket is adjustable and the horn is finished in grey.

Nominal power: 15W
Impedance: 8Ω
Horn diameter: 152mm

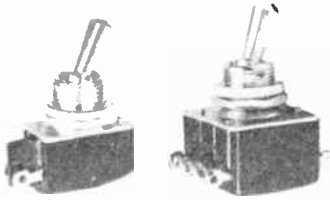


Order

XQ74R (Car PA 15W) £17.95

**CALL IN TO YOUR LOCAL
Maplin SHOP
in MANCHESTER**
8 Oxford Road. ☎061 236 0281

Standard Toggle Switches



A range of toggle switches rated 2A at 250V AC with chrome plated brass dolly and bush. Switches require a 12.7mm panel cut-out. Bush is 10mm long.

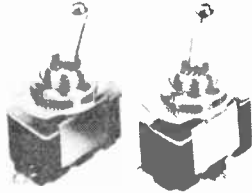
Type	Contact arrangement	Body dimensions (mm)		
		Height	Width	Depth
SPST		31	12.5	14
SPDT		36	12.5	14
DPDT		23*	26	19

*Tags protrude a further 6mm from both sides.

Order

FH10L (Std Toggle SPST)	52p
FH11M (Std Toggle SPDT)	65p
FH12N (Std Toggle DPDT)	£1.10

10A Toggle Switches



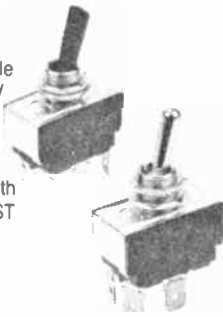
An SPST and SPDT toggle switch with ON/OFF plate. Rated at 250V AC. Body dimensions are (h x w x d) 18 x 12 x 22mm. Mounting hole 10mm.

Order

BK32K (10A SPST Toggle)	£1.20
BK33L (10A SPDT Toggle)	£1.35

Heavy Duty Toggle Switch

A range of heavy duty toggle switches rated 10A at 250V AC or 15A at 6 to 24V DC. Mounting hole 12.7mm. Four types are available. SPST, DPST and DPDT with black nylon levers and DPST with chrome plated brass lever.



Order

FH17T (H/D Toggle DPST Chrm)	£3.95
FH18U (H/D Toggle SPST)	£2.40
FH19V (H/D Toggle DPST)	£2.95
FH20W (H/D Toggle DPDT)	£3.95

Chrome Bar Toggle

A very attractive toggle switch with a thick circular chrome-plated brass bar dolly. Dolly is 21mm long, 6.5mm dia. The switch is ideal for mounting side by side in a bank of similar switches. Switch is DPDT, rated 300mA at 125V AC (100mA at 250V AC). Contact resistance < 10mΩ. Fixing centres: 29mm x M3 tapped. Body size: 36 x 14 x 21mm.



Order

YX56L (Chrome Bar Toggle)	98p
---------------------------	-----

ROCKER SWITCHES Round-Faced Miniature Rocker Switches

A range of three miniature round-faced rocker switches with single round hole fixing and solder terminals. Mounting hole: 18mm. Current rating: SPST and SPDT 240V AC 3A; DPDT 240V AC 1.5A.



Order

FG47B (Round Rocker SPST)	98p
FG48C (Round Rocker SPDT)	98p
FG49D (Round rocker DPDT)	£1.20

Miniature Rocker Switches

A very attractive single hole fixing miniature rocker switch available in SPST and DPDT styles. Switch has a white rocker in a matt finish black frame.

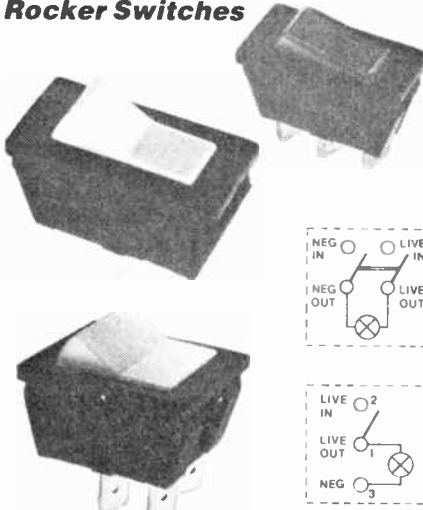


Rating: 6A at 125V AC, (2A at 250V AC)
Contact resistance: < 20mΩ
Panel cut-out: 18mm diameter
Overall depth behind front of panel: 14mm
Overall height in front of panel: 12mm (including rocker) 7.5mm (frame only)
Frame size: 30 x 20mm.

Order

YX64U (Min Rocker SPST)	85p
YX65V (Min Rocker DPDT)	£1.50

Rocker Switches



A range of 10A 250V AC rocker switches having a white polycarbonate body. The switches are snap-mounting and require a panel cut-out 29 x 12.5mm for single-pole types and 29 x 25mm for double-pole types, except for YR70M which requires a cutout of 29 x 22mm. The following types are available. Single-pole, single make (SPST). Single-pole, changeover (SPDT). Single-pole, single make with integral neon indicator with red lens (Neon). Double-pole, single make (DPST). Double-pole changeover (DPDT). Double-pole, single make with integral neon indicator with red lens (Dual Rocker Neon)

Order

FH30H (SPST Rocker)	38p
FH31J (SPDT Rocker)	45p
YR68Y (Rocker Neon)	85p
YR69A (DPST Rocker)	68p
FH34M (DPDT Rocker)	80p
YR70M (Dual Rocker Neon)	98p

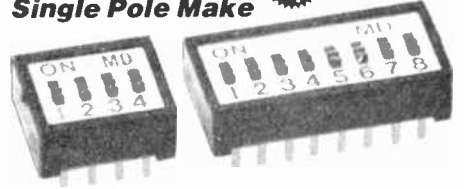
DUAL-IN-LINE SWITCHES

Subminiature switches in dual-in-line packages for on-board switching. Pin spacing 0.3in. x 0.1in. Packages may be butted end-to-end to make longer switch banks.

Available in seven types.



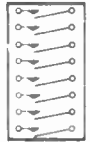
Single Pole Make



SPST Dual



SPST Octal



For single pole single throw in 2, 4, 6, 8 and 10 ways:
Contact rating non-switching: 100mA @ 50V DC
switching: 25mA @ 25V DC max
100mA @ 5V DC

Contact resistance: 50mΩ max
Dielectric strength: 500V DC for 1 minute
Contact material: Gold plating on nickel under-plate
Life: 3000 operations min

Dimensions:-

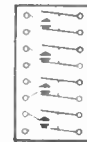
Width:	11mm
Height:	6mm
Length:	2 way 8mm
	4 way 13mm
	6 way 18mm
	8 way 23mm
	10 way 28mm

Single Pole Changeover

SPDT single



SPDT Quad



For single pole double throw in 1 and 4 ways:
Contact rating non-switching: 100mA @ 100V DC
switching: 100mA @ 100V DC

Contact resistance: 10mΩ (20mΩ) max
Dielectric strength: 500V for 1 minute
Contact material: Gold over nickel-plated brass

Life: 30,000 operations

Dimensions:-

Width:	10.8mm
Height:	9mm
Length:	SPDT 12mm
	4PDT 22mm

Order

XX26D (DIL Switch SPST Dual)	75p
FV43W (DIL Switch SPST Quad)	98p
FV44X (DIL Switch SPST 6Way)	£1.30
XX27E (DIL Switch SPST Octal)	£1.52
FV45Y (DIL Switch SPST 10W)	£1.74
XX28F (DIL Switch SPDT Sgl)	98p
XX29G (DIL Switch SPDT Quad)	£2.95

**CALL IN TO YOUR LOCAL
Maplin SHOP
in LONDON**

159 King St., Hammersmith ☎01 748 0926

Slimline 8-Pole Single Make



An 8-pole single throw DIL switch that has dimensions identical to that of a 16-pin DIL IC. The pin-outs are fully compatible with standard IC sockets. The white levers are numbered 1 to 8, and have a movement of 1.5mm. The levers add only 1mm to the overall height of the body. These switches are ideal for use where pcb space is at a premium. Self cleaning contacts.

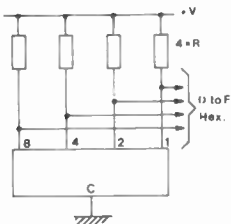
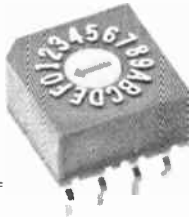
Rating non-switching: 100mA @ 50V DC
 switching: 25mA @ 24V DC
 Contact resistance: 50mΩ
 Dielectric strength: 500V AC
 Insulation resistance: 1000mΩ @ 100V DC
 Life: 5000 operation
 Acceptable soldering temperature: 260°C ±5°C for 10 minutes

Order

QY70M (Slimline 8W DIL Sw) £1.60

ROTARY SWITCHES

Sub-Miniature PCB Mounting 'Hex' Encoded Rotary Switches



Extremely compact, PCB mounting, sub-miniature switch arrays which can produce any 4-bit hexadecimal number from 0 to F by simply turning the integral slotted actuator with a screwdriver, to one of 16 click-stop positions. The switches are 10mm square and 11mm high overall excluding pins. The five pins are spaced for a 0.1in. matrix, comprising one common pin and four 'output' pins for hex 0 to 3.

Switch QY68Y is arranged so that any pin output 'bit 0' in hex is connected to the common pin. Switch QY69A has the complementary arrangement in that any pin output 'bit 0' in hex is open circuit, or not connected to the common pin.

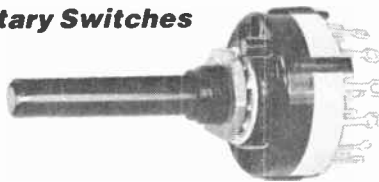
Specifications

Contact rating: 100mA @ 50V DC
 non-switching 100mA @ 5V DC
 switching 100mΩ
 Contact resistance: 100mΩ
 Dielectric strength: 250V AC for 1 minute
 Insulation resistance: >1000MΩ @ 100V DC
 Life: 10000 operations
 Acceptable soldering temperature: 260°C ±5°C for 10 min.

Order

QY68Y (PCB Hex Sw On = 0) £1.98
 QY69A (PCB Hex Sw On = 1) £1.98

Rotary Switches



A high quality rotary switch moulded in glass-filled nylon. Indexing 30°. 6.3mm (1/4in.) spindle. 9.5mm (3/8in.) bush. With adjustable rotation limit stop. Silver-plated contacts.

Bush length: 8mm
 Spindle length: 30mm (with flat)
 Overall length: 58mm
 Max voltage: 300V AC or DC
 Max current: 5A continuous
 Contact resistance: 10mΩ
 Contact rating: 150mA at 250V AC or DC
 350mA at 110V AC or DC

The following types are available:

Break before Make action

1 pole 12 way: FF73Q
 2 pole 6 way: FF74R
 3 pole 4 way: FF75S
 4 pole 3 way: FF76H

Order

FF73Q (Rotary SW12B) 70p
 FF74R (Rotary SW6B) 70p
 FF75S (Rotary SW4B) 70p
 FF76H (Rotary SW3B) 70p

Make before Break action

1 pole 12 way: FH42V
 2 pole 6 way: FH43W
 3 pole 4 way: FH44X
 4 pole 3 way: FH45Y

Order

FH42V (Rotary SW12) 70p
 FH43W (Rotary SW6) 70p
 FH44X (Rotary SW4) 70p
 FH45Y (Rotary SW3) 70p

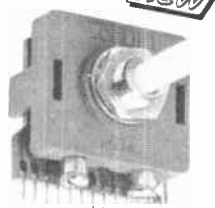
Clickless Switch

A Rotary SW12 without clicks for use with our Train Controller project.

Order

XX45Y (Switchpot 1p 12w) 98p

Right Angle PCB Mounting Rotary Switches



A range of right-angle PCB mounting rotary switches which feature single line PCB insertion pins on a 0.1in. spacing. Two mounting pillars and fixing screws are provided under the switch body to ensure rigid support to the PCB. In addition to the usual 3/16in. spindle bush and nut fitting for front panel mounting, and adjustable end stop. The switch contacts are an integral part of a PCB at rear of the switch and are brought out to the insertion pins at the bottom. Available as make before break in: 1 x 12 way, 2 x 6 way, 3 x 4 way and 4 x 3 way versions.

Order

FT56L (PCB R/A Rotary 1x12) £2.95
 FT57M (PCB R/A Rotary 2x6) £2.95
 FT58N (PCB R/A Rotary 3x4) £2.95
 FT59P (PCB R/A Rotary 4x3) £2.95

Rotary Mains Switch

A double-pole single-throw (DPST) rotary mains switch moulded in flame retardant plastic. Recommended for use in circuits where heavy switching current surges occur. Indexing 45°. 6.3mm (1/4in.) spindle. 9.5mm (3/8in.) bush.

Bush length: 8mm
 Spindle length: 25mm (with flat)
 Overall length: 47mm
 Contact rating: 4A at 250V AC
 Current surge: 80A for 10msec.
 Contact resistance: 20mΩ

Order

FH57M (Rotary Mains) 98p

THUMBWHEEL EDGE SWITCHES

A thumbwheel edge switch in a black plastic housing. This high quality switch has gold plated contacts on both the PCB and wiper to ensure reliable operation. The numbers 0 to 9 appear in the aperture in the front as the aperture is revolved, and the operation is smooth and positive. The switches are front panel mounting with snap-in fixings, and can be snapped together to form a bank of switches if desired. Connections are made as follows:

No.	Pin numbers
	Decimal BCD
0	C and 0 None
1	C and 1 C and 1
2	C and 2 C and 2
3	C and 3 C, 1 and 2
4	C and 4 C and 4
5	C and 5 C, 1 and 4
6	C and 6 C, 2 and 4
7	C and 7 C, 1, 2 and 4
8	C and 8 C and 8
9	C and 9 C, 1 and 8



Switch resistance: 100mΩ
 Current carrying capacity: 3A max
 Contact rating: 125mA at 28V AC or DC
 Character height: 5.08mm
 Width of switch: 8mm
 Overall height: 33mm
 Overall depth: 41mm
 Panel cut-out: 31 x 3mm

Order

FF83E (Thumbwheel Decimal) £4.35
 FF84F (Thumbwheel BCD) £4.35

Dial Stops

Dial stops can be used to convert the thumbwheel switches from ten position to any number less than ten. The coding for stops is as follows:
 E stops any no. before 0 and stops any no. after 9.
 F stops any no. before 1 and stops any no. after 0.
 G stops any no. before 2 and stops any no. after 1.
 H stops any no. before 3 and stops any no. after 2.
 J stops any no. before 4 and stops any no. after 3.
 K stops any no. before 5 and stops any no. after 4.
 A stops any no. before 6 and stops any no. after 5.
 B stops any no. before 7 and stops any no. after 6.
 C stops any no. before 8 and stops any no. after 7.
 D stops any no. before 9 and stops any no. after 8.

Examples:

To read dial nos. 0-7 put stops into positions E & C.
 To read dial nos. 4-8 put stops into positions J & D.
 To read dial nos. 1-8 put stops into positions F & D.
 Supplied only in pairs.

Order

BK50E (Dial Stops) 35p

End Cheeks for Thumbwheel Switches

A pair of end cheeks, one right-hand and one left-hand mounting that enable snap-in mounting. To calculate the size of panel cut-out required use the formula:- Multiply the number of switches by eight, then add eight to give the width in mm, and the height is 31mm.

Order
BK49D (End Cheeks) £1.60

KEY OPERATED SWITCHES Metal Body DPDT



A DPDT rotary switch operated with a Yale key. Ideal for burglar alarms and all security applications. The key may be withdrawn in either position. Two keys provided with each lock. Random supply of 200 different lock numbers. Panel cut-out 19.9mm (3/4in.).

Bezel diameter: 22.2mm
 Bush length: 12.7mm
 Indexing: 90°
 Contact rating: 4A 250V AC
 10A 12V DC

Order
FH40T (Key Switch) £4.95

Plastic Body SPDT

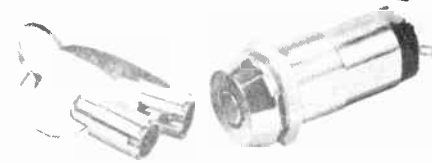


An SPDT rotary switch operated with a non-reversible Yale-type key, in a tough black plastic body. Three solder tags at rear. Barrel has a white pointer dot. Panel cut-out 19.9mm (3/4in.). Supplied with 2 keys.

Bezel diameter: 22mm
 Bush length: 19.5mm
 Indexing: 90°
 Contact rating: 1A 125V AC
 0.5A 250V AC
 Contact resistance: <20mΩ
 Insulation resistance: (α 500V DC >100MΩ)
 Insulation Strength: 1 minute (α 1000V AC)

Order
FV42V (Plas Key Switch) £2.45

Round Key Type



A metal bodied key switch with a chrome plated bezel. The key switch uses a round key for extra high security. The switch is SPDT with three solder tags at rear. Panel cut-out 19.9mm (3/4in.). Supplied with two keys.

396

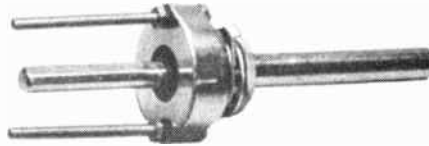
Bezel diameter: 22mm
 Bush length: 20mm
 Indexing: 90°
 Contact rating: 5A @ 125V AC
 1.5A @ 250V AC
 <20mΩ
 Contact resistance: @ 500V DC >100MΩ
 Insulation strength: 1 minute @ 1000V AC

Order
FV41U (Round Key Switch) £5.95

MAKA-SWITCH

Switches may be made up using the various accessories to suit individual requirements. Available only in 'miniature' size. 1/4in spindle, 3/16in bush.

Shaft Assembly



Switch mechanism (shafting assembly) accommodates up to 4 wafers.

Indexing: 30°
 6.3mm (1/4in.) spindle. 9.5mm (3/16in.) bush
 Spindle length: 41mm (with flat).
 Bush length: 8mm
 Overall length: 90mm
 With adjustable rotation limit stop.

Order
FH46A (Maka Shaft) £1.65

Wafers

Glass filled diallyl phthalate stators, acetal rotors and silver-plated contacts.



Max working voltage: 300V AC or DC
 Max current: 5A continuous
 Contact resistance: 10mΩ
 Contact rating: 150mA at 250V AC or DC
 350mA at 110V AC or DC

The following types are available:

Break before Make action
 1 pole 12 way: FH47B. 2 pole 6 way: FH48C. 2 pole 9 way: FF81C. 4 pole 3 way: FH50E. 6 pole 2 way: FH51F.

Order
FH47B (Maka Wafer 1p 12w) 98p
FH48C (Maka Wafer 2p 6w) 98p
FF81C (Maka Wafer 2p 9w) 98p
FH50E (Maka Wafer 4p 3w) 98p
FH51F (Maka Wafer 6p 2w) 98p

Make before Break action

1 pole 12 way, can also be wired as independent 1 pole 2 way for the first 2 positions (thereafter open circuit), followed by the remaining 10 ways on a separate circuit. The wafer can be reversed to make the SPDT action the last 2 positions. The two wiper contacts must be wired together for single pole 12 ways: FH52G. 2 pole 6 way: FH53H. 6 pole changeover (2 way): FF82D.

Order
FH52G (Maka Wafer 1p 12w MB) 98p
FH53H (Maka Wafer 2p 6w MB) 98p
FF82D (Maka Wafer 2p 9w MB) 98p

Screen

Metal plate to mount between wafers for screening.

Order
FH55K (Maka Screen) 8p

MICROSWITCH



A 5A 240V AC microswitch with single pole changeover contact lever. Body size 27.5 x 16 x 10mm. Fitted with a roller on the end of an operating lever.

Order
FH95D (Roller Microswitch) £1.45

SLIDE SWITCHES Single Pole Sub-Miniature

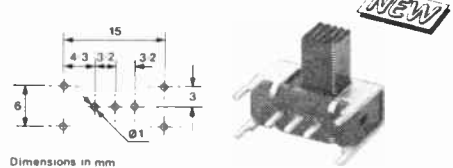
Sub-miniature SPDT slide switch suitable for use as replacements in calculators, clocks etc. Can be PCB mounted.



Dimensions: Body: 11 x 5 x 6mm
 Front plate: 19 x 5mm
 Tang: 3.8mm long (throw 3.4mm)
 Tags: 2.7mm long x 1.8mm wide
 Fixing centres: 15mm x 8BA clear
 Rating: 100V AC 0.5A, 18V DC 0.8A.

Order
FF77J (SP Slide) 18p

Single-Pole Right-Angled



A sub-miniature right-angled SPDT slide switch for pcb mounting. Ideal for horizontal left/right action on edge of pcb etc. Dimensions of body: 16mm wide x 6.5mm deep Height above pcb: 9.5mm Toggle: 8mm (throw 3mm)

Order
FV01B (R/A SPST Slide) 28p

Double Pole Sub-Miniature

A sub miniature DPDT slide switch with wiring tags.



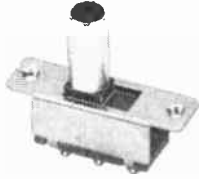
Dimensions: Body: 15 x 8 x 8mm
 Front plate: 23 x 8mm
 Tang: 7mm long (throw 3.4mm)
 Tags: 2mm long x 1.8mm wide
 Fixing centres: 19mm x M2 tapped
 Ratings: 125V AC 0.5A, 18V DC 0.8A

Order
FH35Q (Sub-Min Slide) 24p



0702 552911

Double Pole Sub-Miniature Chrome Tang



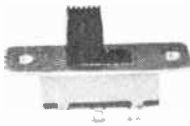
A sub-miniature DPDT slide switch with wiring tags and a long tubular chromed tang.

Dimensions: Body: 15 x 8 x 8mm
 Front plate: 23 x 8mm
 Tang: 14mm long (throw 3.4mm)
 Tags: 2mm long x 1.8mm wide
 Fixing centres: 18mm x M2 tapped

Ratings: 125V AC 0.5A, 18V DC 0.8A

Order
FF79L (Long Chrome Slide) 28p

Double Pole Miniature



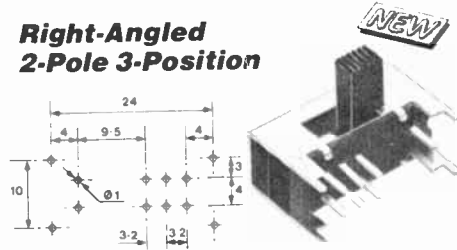
A miniature DPDT slide switch with wiring tags.

Dimensions: Body: 22 x 13 x 8mm
 Front plate: 35 x 13mm
 Tang: 9.5mm long (throw 5.3mm)
 Tags: 4.2mm long x 2.8mm wide
 Fixing centres: 28mm x M3 tapped

Ratings: 125V AC 1A, 18V DC 1.5A

Order
FH36P (Std Slide Switch) 28p

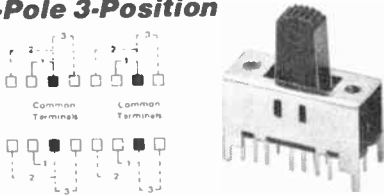
Right-Angled 2-Pole 3-Position



A 2-pole 3-way switch with a horizontal slider with left/right action for pcb edge mounting.
 Dimensions of body: 25mm wide x 10mm
 Height above pcb: 14mm

Order
FV02C (R/A DT3T Slide) 40p

4-Pole 3-Position



Miniature 4-pole 3-position Rated 125V AC 0.3A.

Order
FH38R (4-Pole Slide) 48p

PUSH SWITCHES Push to Make Low Cost

Miniature low cost push to make switch non-locking with red button. Overall size: 28mm long, 10.5mm dia. Rated 250mA 125V AC. Panel cut-out 7mm dia.



Order
FH59P (Push Switch) 20p

Push to Make High Quality

Miniature high quality push to make switch non-locking with red button. Overall size: 28mm long, 11mm dia. Rated 1A 125V AC. Panel cut-out 7mm dia.



Order
YR67X (HQ Push Switch) 45p

Push to Break

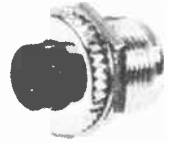
Miniature non-locking push to break switch with black button. Rated 1A 250V AC.



Order
FH60Q (Break Push) 28p

Large Push to Make

A push button switch with a large red dimpled button and smart chromed bezel. Action is non-locking push to make single pole. Panel fixing requires 12mm dia. cut-out. Rated 1.5A at 240V AC.



Order
FH91Y (Motor-Start Press) 48p

Miniature Momentary Action

A miniature momentary action, panel mounting, push button switch with a separate 10mm cap. Fitted with solder terminals. Initial contact resistance: <10mΩ



Dimensions: Length (overall) 39.5mm
 Diameter (behind panel) 22mm
 Cut-out 6.4mm
 Body size 10 x 13.2mm
 Button diameter 4mm

Order
BK68Y (SPCO Nonlock Switch) £2.20
BK71N (10mm Cap Green) 12p

Silver Pushbutton

A square silver-finish panel-mounting push button switch. Round hole fixing. Available in alternate and momentary action. Rating: 1A at 240V AC Panel cut-out: 10.2mm



Order
FG45Y (PB Silver Momentary) £1.45
FG46A (PB Silver Alternate) £1.45

Table Light Switch

A push-on push-off single pole make/break switch with a white push button.

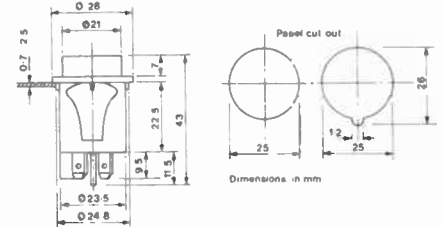
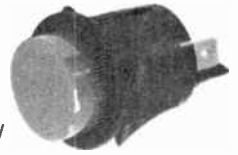
Panel cut-out: 10mm.
 Max panel thickness: 4mm
 Switch body dimensions: 24 x 13 x 8.5mm
 Rated: 2A at 250V AC.
 Connections by screw terminals.



Order
FH94C (Table Light Switch) 28p

Large Push Button

A large push button switch in an attractive modern styling. Available with SPST non-latching contact, in red only. Rated at 16A/250V AC, and has snap-in fixing for panels between 0.7mm & 2.5mm thickness.



Order
RK82D (Lge Red Push Button) 68p

Square Push to Make

Push to make non-locking switch with a large square button available in Black and Red.



Panel cut-out: 12.7mm (1/2in) diameter
 Overall length: 39mm (1 1/2in)
 Length behind bezel: 29mm
 Button: 10mm square
 Bezel (elephant grey): 14mm square

Order
FF96E (Square Push Black) 80p
FF98G (Square Push Red) 80p

Square Locking

Push to make locking switch with large square button available in Black and Red.



Panel cut-out: 12.7mm dia.
 Overall length: 39mm
 Length behind bezel: 29mm
 Button: 10mm square
 Bezel: 14mm square

Order
YW41U (Square Psh Lck Black) 95p
YW43W (Square Psh Lck Red) 95p

Round Locking

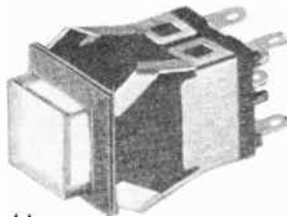
Miniature push button switches with 3A 250V AC contacts. Single-pole changeover (SPCO) and double pole changeover (DPCO) types are available. Both are locking (i.e. press-press). Fitted with red plastic button with dimpled top.

Panel cut-out: 6mm
 Bush length: 7.5mm
 Body dimensions (excl tags): 11.6 x 6.5 (SPCO); 11.7(DPCO) x 17mm
 Button dimensions: 8 x 10mm dia.

Order
FH41U (Pushlock SPCO) £1.20
FH66W (Pushlock DPCO) £1.50

Illuminated Push Button Switch

NEW



Switch Assembly

Attractive square push button switches in push/push locking or non-locking styles, with a double pole make function, using two pairs of solder tags at rear. The switches include a sprung metal snap-in-plate which makes installation simply a process of pressing the switch into a 1/2in. square (12.7 x 12.7mm) hole. The buttons are 9.8mm square in a 14mm square escutcheon. Overall length 23mm less tags. Contact rated 100mA at 30V DC.

Note Lens cap and bulb must be ordered separately. The switch can be used without the bulb if desired.

Order

FA78K (Illuminated Momtry Sw)	£1.45
FA79L (Illuminated Latch Sw)	£1.45

Lens and Diffuser

A lens and diffuser cap for the above switches, is available in red, white, yellow, blue and green. The diffuser provides an even illumination.

Order

UF54J (Lens + Diffuser Red)	18p
UF55K (Lens + Diffuser Wht)	18p
UF56L (Lens + Diffuser Yel)	18p
UF57M (Lens + Diffuser Blu)	18p
UF58N (Lens + Diffuser Grn)	18p

Bulbs and Holders

Twin-pin filament bulbs which, using a special holder, plug into the switch body and so illuminate the coloured cap. The bulbs are available in:

Voltage	6V	12V	28V
Current	65mA	50mA	24mA
Average life	10,000h	10,000h	5000h
Colour coded	Red	Green	White

Order

UF59P (6V Lamp + Holder)	72p
UF60Q (12V Lamp + Holder)	72p
UF61R (28V Lamp + Holder)	84p

Bulb Extractor

A tool required to remove the twin-pin filament bulbs.

Order

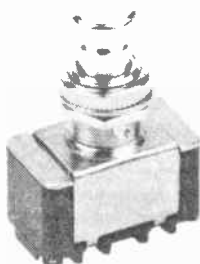
FA80B (Extraction Tool)	5p
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Foot Switch

Hard-wearing push-on push-off switches with strong metal shafts and knobs for use as foot operated switches. All types require a 12.7mm (1/2in) dia. panel cut-out and have 12mm long threaded bushes.

2A Type

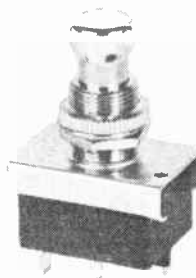
This switch has a pair of tags at each end. When the pair at one end is made, the pair at the other end is broken and vice versa on each successive operation. Two tags may be linked to give SPDT operation. Rated 2A at 250VAC. Body size: 36 x 12 x 15mm. Bush and knob length: 28mm.



Order

FH92A (Press Toe SPDT)	£2.60
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6A Types



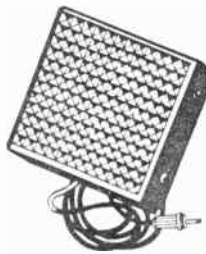
Two switches, one SPST one DPDT. Rated 6A at 250V AC, 10A at 120V AC Body: 28 x 18 x 23mm Bush and knob length: 24mm

Order

BK31J (Press Toe SPST)	£1.95
FH93B (Press Toe DPDT)	£2.40

Foot Control Switch

A snap action foot control switch with skid-proof rubber base pad, lead and 2.5mm plug. Body size 80 x 100 x 23mm.



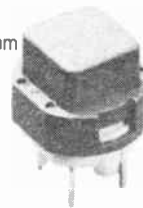
Order

LB64U (Foot Switch)	£4.50
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Click-Effect Push Switch

A neat, small low cost push switch in a matt grey finish for direct pcb mounting. Smooth, gentle and positive action with a click-effect so that you know switch has operated. Action is single-pole push-to-make non-locking. Switch has a small square button fitted to a circular base. Each contact is connected to two pins for ease of track layout on pcb. Contact is self-cleaning laminated silver.

Contact rating:	10mA at 35V DC
Contact resistance:	≤50mΩ
Bounce:	1ms
Insulation resistance:	>10 ⁵ MΩ
Life:	10 ⁶ operations
Inter-contact capacity at 1MHz:	<1pF
Key travel:	0.8mm
Size of button:	7.7 x 7.7mm
Height of button:	4mm
Overall diameter:	11.5mm
Overall height from pcb:	10.8mm
Pin length:	2.8mm
Pin diameter:	0.6mm
Pin spacing:	5 x 5mm



Order

FF87U (Click Switch)	28p
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Caps For Click Switch

Three different colour caps which may be snapped on to our click-effect push switches.

Size of cap:	12.4 x 12.4mm
Height of cap:	5.5mm
Overall height from pcb:	12.3mm
Available in the following colours:	Black, Blue, and White

Order

FF88V (Click Cap Black)	18p
FF89W (Click Cap Blue)	18p
FF94C (Click Cap White)	18p



Small Click Switch



A neat, small and very low-cost push-switch for direct PCB mounting. The switch has a smooth, gentle, but positive action with a click-effect to let you know switch has operated. Action is single-pole push-to-make non-locking and one contact is connected to two pins, one on either side of the switch to ease PCB track layout. The switch requires a cap from the list below to operate.

Specification:

Contact rating:	10mA max.
Contact resistance:	<1Ω
Bounce:	<5ms
Life:	>2.5x10 ⁵ operations
Key travel:	0.5mm
Pin length:	3.5mm
Pin diameter:	0.8mm
Pin spacing:	10 x 4mm

Order

FT16S (Small Click Switch)	20p
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Caps For Small Click Switch

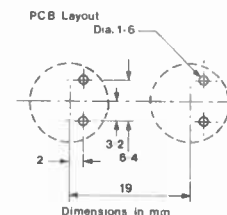


Snap on caps for the small click switch available in either high profile or low profile types. The high profile cap is 11.5mm above the PCB and only available in black. The low profile caps extend 8mm above PCB, and are available in the following colours – Red, Green, White, Blue, and Black. Both types are 12.3 x 12.3mm square.

Order

FK85G (L/P Cap Red)	12p
FK87U (L/P Cap Green)	12p
FK89W (L/P Cap White)	12p
FK91Y (L/P Cap Blue)	12p
FK93B (L/P Cap Black)	12p
FK94C (H/P Cap Black)	12p

Keyboard Switch



A low-cost non-locking push switch designed for making up keyboards and key pads etc. The keytops must be ordered separately. Designed to be mounted directly on the pcb, the centre of each switch should be 19mm distant from its neighbour. The keytops will then butt up to one another to avoid having a complicated front panel cut-out.

Specification:

Rating:	1mA at 24V DC
Bounce:	10ms max. (4ms typical)
Contact resistance:	200mΩ
Stroke:	2.5mm
Life:	10 ⁶ operations
Overall size:	15 x 15mm
Height:	17mm (excluding 3mm pins)
Height with key-top:	19mm (excluding pins)
Switches are non-locking push-to-make.	

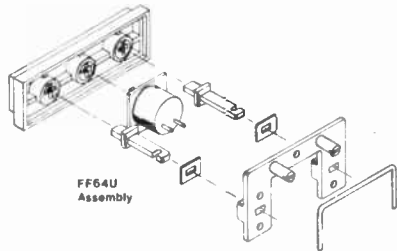
Order

FF61R (Keyboard Switch)	24p
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Keyboard Switch Keytop



A two-part key-top which snaps on to the switch. The top is in two parts, the upper part being transparent. Thus the lower part may be engraved, marked with Letraset, or a piece of printed card may be placed on it, then when the top part is snapped on the key-top appears to have a legend printed on it.



Available in: 1 x 1: size 18 x 18 x 9mm; 2 x 1: size 36 x 18 x 9mm; 3 x 1: size 54 x 18 x 9mm (The 3 x 1 key-top comes complete with a bar so that the top does not slip sideways around the switch plunger. Assembly is shown in the drawing.)

Order

FF62S (Keytop 1 Position)	18p
FF63T (Keytop 2 Position)	24p
FF64U (Keytop 3 Position)	68p

ASCII Character Set Transparency

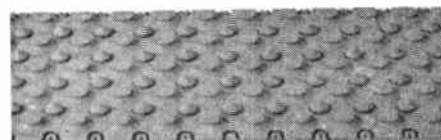


An ASCII character set on transparent film with cut lines to fit our Keyboard Switch Key-tops. Characters may be placed directly in the key-top or with a piece of thin coloured card to give the effect of having coloured keys.

Order

FF65V (ASCII Transparency)	£1.50
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Conductive Rubber Contact Keyboards



A sheet of long-life silicone rubber with dimples preformed into it. On the underside of each dimple is a piece of conductive rubber. The sheet then, is laid on the tracks on a pcb such that when a dimple is pressed the conductive carbon shorts out two tracks on the pcb. Thus a simple highly effective yet extremely low-cost switch is effected. The switches have a built-in snap effect and are already extensively used in calculators, toys, hand-held games, data entry systems, telephones, TV remote controls, cash registers etc. The sheets may be easily cut to any size required, and are supplied in one size only with 70 switches in a 5 x 14 matrix. A piece of thin flexible plastic may be laid on top with switch designations marked on it, or for cheapness the rubber itself could be marked. Note that you must be careful not to block the air channels when you fix the sheet to the pcb.

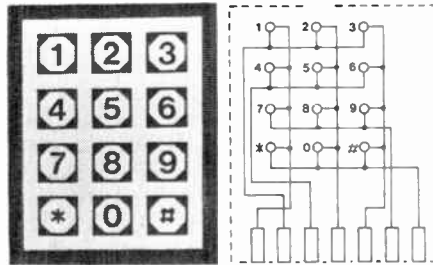
Specification:

Contact resistance:	100Ω approx. at 300g (70Ω minimum)
Contact rating:	24V max, 100mA max
Switch movement:	1.2mm
Sheet size:	147 x 60 x 3mm
Dimple top diameter:	5mm
Typical life:	1 million actuations

Order

YR71N (Switch Contact Sheet)	£1.40
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NUMERICAL KEYPADS Membrane Switch Keypad



A keypad annotated in exactly the same way as a push-button telephone key-pad, with digits 0 to 9, a # key and an asterisk key. The water repellent plastic surfaced switch is fitted with a self-adhesive pad on the rear for easy mounting. Connections terminated in a 7-way flat connector, (fits BK73Q), as per diagram. Measures 64mm x 81mm x 0.5mm approx.

Order

BK72P (Membrane Switch)	£9.95
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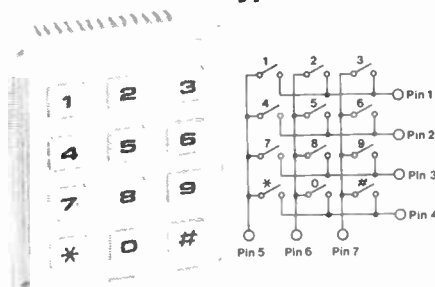
Flat Flex Connector

A 7-way connector for use with BK72P Keypac. Designed to fit upright onto pcb's with 0.1in matrix, it will accept bared conductors on either side of the inserted flex.

Order

BK73Q (Flat Flex Connector)	95p
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Press Button Keypad



A numeric keypad comprising twelve square, double shot moulded white buttons with black legends, on a cream ABS escutcheon. Legends are 0 to 9, asterisk and hash (#). The buttons operate conductive silicon rubber pads and have a click effect. The single pole make switches are arranged on a four by three X/Y matrix. Overall dimensions 64mm high x 51mm wide x 9mm thick incl. buttons. Fixing centres 46 x 59mm.

Specifications:

Contact rating	24VDC at 5mA
Contact resistance	200Ω max
Bounce	10 msec max
Key travel	1.5mm
Actuating force	120 grams
Life, per key	1,000,000 operations

Order

FM48C (Numeric Keypad)	£4.50
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ALPHANUMERIC KEYBOARDS NEW Miniature 68-Key Keyboard



A compact 68 character/function keyboard using a single pcb with gold-plated contact areas, acted on by silicon rubber conductive pads. The ABS keytops are supported in an ABS frame, which can be moved or changed as desired. Six spare blank 10mm² keytops are provided to replace functions not required on the original keyboard. The click-effect keys have a positive tactile feel and the 8 x 8 way switch matrix is accessible at the top centre of the pcb via the 16 solder pads spaced at 0.1in., suitable for mini-con latch terminals, etc. Rubber conductive contacts.

Rating	5mA @ 24V DC
Resistance	200Ω max
Bounce	10ms
Life	1 million operations
Dimensions	193mm x 70mm x 11mm deep
Keypad	10 x 10mm (x 22.6mm double)
Travel	1.5mm

The character set includes all the usual alphanumeric characters including shift characters, SHIFT, ENTER and spacebar. Other keys are legended as PRINT, ESC, TAPE, CNTL, SERVE, X ON, X OFF, EDIT, PHONE, TONE, PULSE, BREAK, LOCAL, CLEAR, MANL.

Order

YJ87U (Miniature Keyboard)	£27.95
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High Quality Alphanumeric Keyboard



A smart, professional looking keyboard in typewriter/VDU format, having double injection moulded, light grey key caps with black legends. The double injection moulding method of manufacture means that the legend is an integral part of the structure of the cap, and not merely a transfer that will rub off. There are 49 character keys including a space bar. In addition to the alphabet in upper case (SHIFT) and lower case (un-SHIFT) there are:-

SHIFT: ! " # \$ % & ' () = ~ :
 Un-SHIFT: 1 2 3 4 5 6 7 8 9 0 -
 SHIFT: { + * } < > ? -
 Un-SHIFT: @ [; : , . / - SP

There are a further 12 darker grey control keys, making 61 keys in all. These are labelled as CAN (cancel), CTRL (control), SMALL, REPT (repeat), DEL (delete), ESC (escape), plus two TAB keys, one large arrowed carriage return key and one arrowed back-space key. There is one other plain, unmarked key for any extra auxiliary function not catered for. The keyswitches are mounted in a steel support panel 325mm long and 100mm wide. The panel has folded edges for rigidity, and four mounting slots providing fixing centres at 77mm x 315mm approx. The keyboard is 30mm thick overall, and the key plungers have a 4mm movement. Each single-pole/single-make keyswitch has a pair of pins for a printed circuit board, but switches could be hard-wired instead. The caps are 18mm square at base, 13.5mm square at top and inclined 11°.

Order

YJ12N (Keyboard Without Pad)	£34.95
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Alphanumeric Keyboard with Number Pad

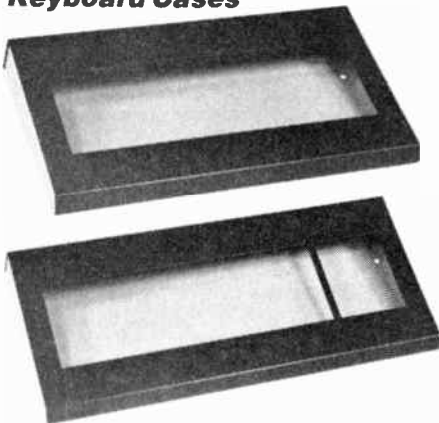


An alphanumeric keyboard identical to that above, but with the addition of a numeric keypad at the right-hand side of the main keyboard. The numeric pad has 18 keys comprising numbers 0 to 9, comma, decimal point, minus, plus and equals signs, slash and asterisk. The eighteenth key is labelled ENTER. The two key arrays are mounted on a steel panel 410mm x 100mm, with slotted fixing centres 77mm x 402mm approx. All other dimensions are as single alphanumeric keyboard above.

Order

YJ13P (Keyboard With Keypad) £39.95

Keyboard Cases

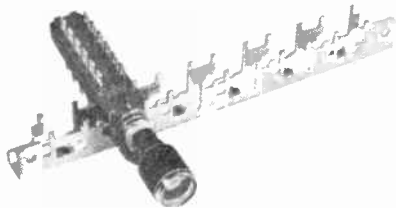


Metal cases for housing the keyboards above. The cases are ready punched to accept the key banks, and include a cut-out at rear for cable entry or socket.

Order

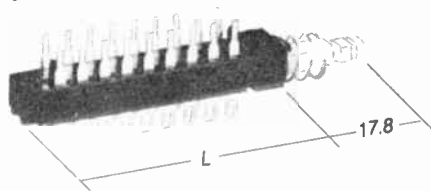
YJ15R (Case For YJ12N) £14.95
YJ14Q (Case For YJ13P) £15.95

INTERLOCKING PUSH-BUTTON SWITCH SYSTEM



A very high quality low cost range of push-button switches each of which is capable of being adjusted for push-on/push-off (locking) operation or momentary push (non-locking) operation singly or in interlocking groups. A retainer clip is supplied with each switch which converts it to a momentary action. Almost infinite variations of configurations of switches are possible so that these switches fulfill practically all the requirements of a quality push-button switch installation.

Signal Switches



Contacts are silver-plated brass with moving

contacts spring-loaded and contoured to achieve constant pressure and positive self-cleaning action and long-term low contact resistance. The polycarbonate housing has printed circuit pins fixed on top face and solder terminals on bottom face. The plunger with moving contacts can be removed from the front for maintenance without removing wires, but these switches are protected against ingress of dust or flux.

Rated: 0.5A, 100V AC
 0.2A., 250V AC
 1A, 25V DC
 Max. contact resistance: 6mΩ; after 25,000 cycles: 20mΩ max.

Insulation resistance between adjacent contact or frame and any contact: > 1 x 10¹²Ω
 Life: 100,000 cycles (50,000 interlocked). Break before make.
 Action:

Length (L) of signal and dummy switch:
 2-pole changeover: 24mm
 4-pole changeover: 36mm
 6-pole changeover: 48mm
 Dummy: 11mm

The 2-and 4-pole switches are available with a light touch in addition to the standard versions. Four different button styles are available giving a wide choice of possibilities.

Standard Touch

These switches are operated by a normal pressure and are available in the following types: 2-pole changeover; 4-pole changeover; 6-pole changeover.

Order

FH67X (Latchswitch 2-pole) 40p
FH68Y (Latchswitch 4-pole) 60p
FH69A (Latchswitch 6-pole) 80p

Light Touch

These switches are operated by a very light touch and are available in two types: 2-pole changeover; 4-pole changeover.

Order

BW11M (Latchsoft 2-pole) 55p
BW12N (Latchsoft 4-pole) 80p

Dummy Switch

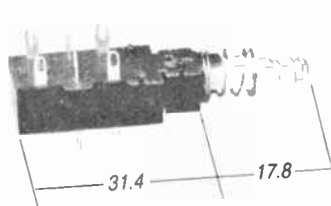


A dummy switch suitable for use as a release button on interlocking groups.

Order

FH72P (Latchdummy) 30p

Mains Switch



A mains switch which can be used for all the types of operation that the signal switches are capable of, and is fully compatible in interlocking groups.

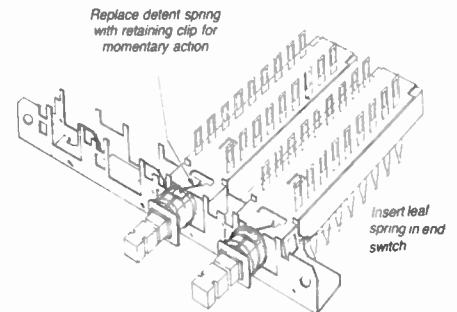
Rated: 4A at 250V AC (non-inductive load)
 Contact arrangement: DPDT

Order

FH74R (Mains Latchswitch) £1.95

Mounting Brackets

A range of brackets for mounting (and providing interlocking action) the latchswitches which have no other method of fixing except the p.c. pins. The brackets are suitable for mounting up to 10 switches, any group of which are capable of being interlocked, and any switch may be locking or non-locking whether interlocked or not. The single bracket is only a mounting frame whilst the other brackets comprise the mounting frame, a latching bar and a latch return spring. Note that the latch bar is supplied in a max lengths of 5-ways. For longer lengths, more than one bar and joining pieces are supplied.



The leaf spring is pressed in between the paxolin top and the body of the switch.

Order

FH75S (Latchbracket Single) 20p
FH76H (Latchbracket 2-way) 40p
FH78K (Latchbracket 4-way) 60p
FH80B (Latchbracket 6-way) 80p
FH82D (Latchbracket 8-way) 80p
FH84F (Latchbracket 10-way) 80p

Round Button

Diameter: 12.3mm; Length: 12.5mm. Available in the following colours: Black, Red and Chrome.



Order

FL31J (Rd Latchbutton Black) 18p
FL34M (Rd Latchbutton Red) 18p
FL36P (Rd Latchbutton Chrm) 28p

Small Round Button

Diameter: 8.8mm. Length: 10.5mm. Available in Black and Chrome.



Order

BW13P (Sm Latchbutton Black) 18p
BW14Q (Sm Latchbutton Chrm) 28p

Rectangular Buttons

Width: 14.7mm; Height: 7.4mm; Length: 11mm. Button can be mounted horizontally or vertically. Available in the following colours: Black, Grey, Red and White.



Order

FH61R (Rct Latchbutton Blk) 15p
FH62S (Rct Latchbutton Grey) 15p
FH63T (Rct Latchbutton Red) 15p
FH64U (Rct Latchbutton White) 15p

"Magic Light" Buttons

A pair of "magic light" buttons which may be used where illuminated buttons would normally be needed. They use no energy, need no lamp, lampholder, power supply, switch contact or wiring, generate no heat



and eliminate lamp replacement, yet are very bright in all but the very darkest locations. When unoperated a clear plastic lens is visible with black interior. When button is pressed a highly reflective coloured disc "magically" appears behind the transparent lens. Button shell is black and the following "magic light" colours are available: Orange and Yellow.

Order

- FH89W (Magiclight Btnn Orng) 60p
- FH90X (Magiclight Btnn Yllw) 60p

Single Switch Mounting Bush

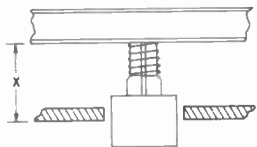
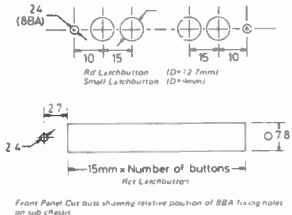


A bush and button that will fit on to any Latchswitch. The bush allows the latch-switches to be fixed to a panel with a single round hole. The bush can only be used with the magiclight-type button supplied with it. (This button is not the same mechanically as our standard Magiclight Buttons, although the coloured effect is the same). Shell colour: black. Overall diameter: 19mm. Panel cut-out: 14mm. Available in blue only.

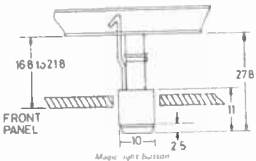
Order

- BW15R (Latchbush Blue) £1.10

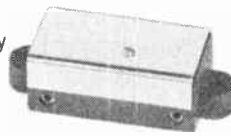
Mounting Details For Latchswitches



- X for Rct Latchbutton 10 to 14mm
- X for Rct Latchbutton 10 to 15.5mm
- X for Small Latchbutton 10 to 12.5mm



Flasher Unit



A 240V mains, thermally operated change-over relay capable of switching up to 500W. The relay may be used to flash one lamp on and off and in addition a second lamp may be added such that when lamp 1 is off, lamp 2 is on and vice-versa. The flash time is 1/4 secs. on/off, and is adjustable up to 10 secs. Not suitable for use with fluorescent tubes. The unit is built on a heavy ceramic base with brass inserts.

Dimensions: 95 x 38 x 29mm
Fixing centres: 81.5 x 3.2mm

Order

- LB91Y (Flasher Unit 2-Way) £9.95

MORSE KEYS Beginners



A well-designed morse key ideal for beginners.

Order

- LQ00A (Beginners Morse Key) £1.95

Professional

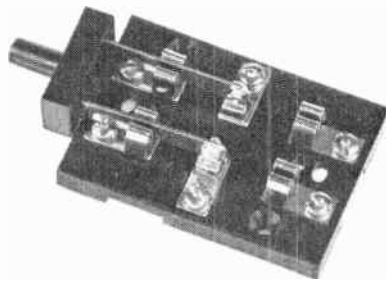


A professional high-speed morse key mounted on a cast metal base. With fine adjustment and override switch for tuning.

Order

- LQ01B (Professl Morse Key) £4.95

KNIFE SWITCH



Ideal for educational and demonstration purposes, the switch is double-pole changeover, having four sets of spring contacts, along with the fulcrums of the moving contacts, fixed to a base-board. The base-board has two screw holes for anchoring to another surface. Uses should be restricted to switching voltages not exceeding about 24VDC. Excessive current may damage the contact surfaces or even cause them to be spot-welded together. A safe maximum current rating is about 10 to 15A. The base board is 60mm long x 43mm wide and 6mm thick. The tip of the handle to the pivot point measures 50mm. Connections are made to six screw terminals.

Order

- FK31J (Knife Switch) 60p

TOUCH PAD

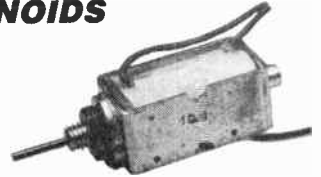


Matt finish chrome-flashed steel touch pad with bevelled edges. An 18.5mm long 6BA threaded stud is welded centrally to the back of the pad. Suitable for mounting on plastic or any insulating material. Pad is triangular. Width of base 21mm. Height: 22mm.

Order

- HY01B (Touch Pads Tri) 28p

SOLENOIDS



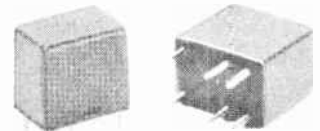
A miniature solenoid suitable for light high speed duty and capable of operating in excess of 300 cycles per minute (5Hz). The plunger has a maximum stroke of 16mm, 5.5mm dia. and the end is 6BA tapped. The hard brass push-rod has a diameter of 1.8mm diameter and an effective maximum stroke of 12.7mm. Single hole fixing, 6.35mm panel cut-out. With 300mm flying leads. Two types are available. Dimensions of body: 38.5 x 18 x 16mm.

	12V DC Coil	240V AC Coil
Pull force at 10mm	28g	56g
Pull force at 3mm	56g	225g
Nominal coil voltage	12V DC	240V AC
Coil resistance	48Ω	12,800Ω
Coil power	3W	4.5W

Order

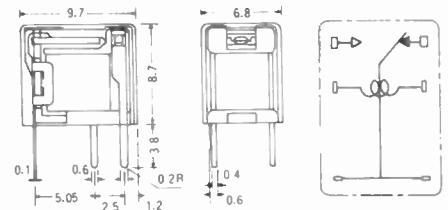
- YR88V (Solenoid 12V) £7.95
- YR89W (Solenoid 240V AC) £7.95

RELAYS Micro Miniature Relay



This micro miniature relay which is only a little larger than a TO5 transistor package is designed for direct PCB mounting. The relay is fully enclosed on the top and sides and there is an insulation sheet on the bottom. Available in single-pole change-over style only with silver contacts.

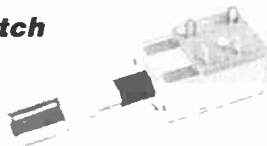
Dimensions: 9.7 x 6.8 x 8.7mm high excluding pins. Pin length: 3.8mm.



Contact details:

- Max current: 2A DC, 2A AC resistive
1A AC inductive
- Max voltage: 24V DC, 100V AC
- Life: >100,000 operations
- Max contact resistance: 50mΩ
- Operate time: 3.5ms
- Release time: 1.8ms

Mains Switch



DPST push-button switch with knob. Rated 4A at 240V AC. Size of body 27 x 18 x 14mm. Operating rod 20mm long unoperated; 16mm long when operated. Fixing centres 18mm. Holes are blind untapped suitable for a No. 4 self-tapping screw. Maximum depth of screw 1/4in.

Order

- FH37S (Mains Push) £1.20

★All prices include VAT★ Price charged will be that current on the day of despatch. See prices on page 15.

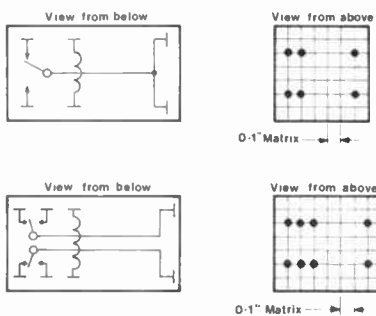
Coil details:

Nominal voltage:	6V DC	12V DC	24V DC
Coil resistance:	80Ω	320Ω	1000Ω
Operate voltage range:	4.8V to 7.2V	9.6V to 14.4V	19.2V to 28.8V
Must release voltage:	>0.6V	>1.2V	>2.4V

Order

FM89W (Micro-Min Relay 6V)	98p
BK47B (Micro-Min Relay 12V)	98p
FM90X (Micro-Min Relay 24V)	98p

Ultra Miniature Relay



An ultra miniature relay designed for direct printed circuit mounting. The relay is fully enclosed on the top and sides and there is an insulation sheet on the bottom. Available in single-pole and double-pole changeover styles. Silver contacts.

Dimensions:

Single pole — 14.8 x 9.8 x 10mm high excluding pins. Double pole — 18.65 x 9.8 x 11mm high excluding pins. Pin length: 3.5mm.

Contact details both types

Max current:	2A DC, 2A AC resistive 1A AC inductive
Max voltage:	24V DC 120V AC
Life:	>100,000 operations
Max contact resistance:	50mΩ
Operate time:	4ms (1-pole), 5ms (2-pole)
Release time:	1.5ms (1-pole), 1.8ms (2-pole)

Coil details Single-pole Types:

Nominal voltage:	6V DC	12V DC	24V DC
Coil resistance:	100Ω	400Ω	1600Ω
Operate voltage range:	4.5V - 7.8V	9V - 15.6V	18V - 31.2V
Must release voltage:	>0.6V	>1.2V	>2.4V

Coil details Double-pole Types:

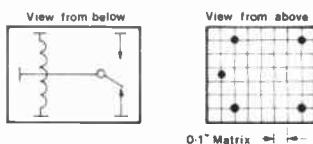
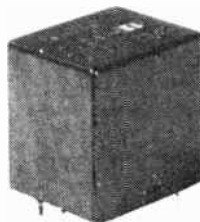
Nominal voltage:	6V DC	12V DC	24V DC
Coil resistance:	80Ω	320Ω	1280Ω
Operate voltage range:	4.5V - 7.8V	9V - 15.6V	18V - 31.2V
Must release voltage:	>0.6V	>1.2V	>2.4V

Order

FM91Y (Ult-Mn Relay 6V SPDT)	98p
YX94C (Ult-Mn Relay 12V SPDT)	98p
FM92A (Ult-Mn Relay 24V SPDT)	98p
BK48C (Ult-Mn Relay 6V DPDT)	£1.40
YX95D (Ult-Mn Relay 12V DPDT)	£1.40
FM93B (Ult-Mn Relay 24V DPDT)	£1.40

3 Amp Miniature Relay

A sub-miniature relay with silver contacts capable of switching up to 3A DC and AC (resistive). The relay is fully enclosed on the top and sides and there is an insulation sheet on the bottom. Available with a single-pole changeover silver contact. Designed for direct printed circuit mounting.



Dimensions: 19.3 x 15.6 x 19mm high excluding pins. Pin length: 3.5mm.

Contact Details:

Max current:	3A DC, 3A AC resistive 1.5A AC inductive
Max voltage:	24V DC, 120V AC
Life:	>100,000 operations
Max contact resistance:	50mΩ
Operate time:	7ms
Release time:	2ms

Coil Details:

Nominal voltage:	12V DC
Coil resistance:	400Ω
Operate voltage range:	9V to 16.8V
Must release voltage:	>1.2V

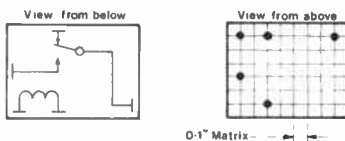
Order

YX96E (3A Min Relay)	95p
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Ultra Miniature High Power Mains Relay



An ultra-miniature relay capable of switching 10A resistive at 240V AC. The relay is fully enclosed and is designed for direct printed circuit mounting. Available with a single-pole changeover silver cadmium oxide contact.



Dimensions: 21 x 16 x 14.2mm high excluding pins. Pin length: 3.5mm.

Contact Details:

Max current:	10A DC, 10A AC resistive 3A AC inductive
Max voltage:	30V DC, 240V AC
Life:	>75,000 operations
Max contact resistance:	50mΩ
Operate time:	6ms
Release time:	2ms

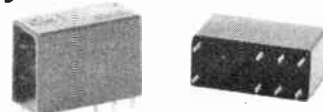
Coil Details:

Nominal voltage:	12V DC
Coil resistance:	320Ω
Operate voltage range:	9V to 19.2V
Must release voltage:	>1.2V

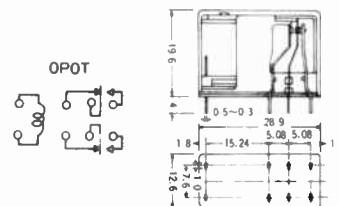
Order

YX97F (10A Mains Relay)	£1.80
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Miniature Double Pole Mains Relay



A miniature relay with contacts capable of switching 5A at 240V AC resistive. The relay is fully enclosed and designed for direct printed circuit mounting. Contacts are silver cadmium oxide.



Dimensions: 28.9 x 12.6 x 19.6mm high excluding pins. Pin length: 4mm.

Contact Details:

Max current:	5A DC, 5A AC resistive 5A AC (120V max) inductive
Max voltage:	30V DC, 240V AC
Life:	>100,000 operations
Max contact resistance:	50mΩ
Operate time:	15ms
Release time:	7ms

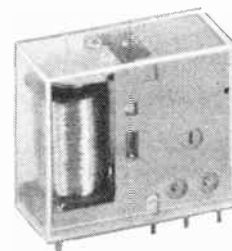
Coil Details:

Nominal voltage:	12V DC
Coil resistance:	200Ω
Operate voltage range:	8.4V to 16.8V
Must release voltage:	>1.2V

Order

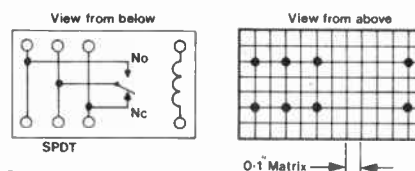
YX98G (5A Mains Relay)	£1.80
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12V DC 16A Miniature Relay



A miniature relay especially suitable for use in automobile applications. It can switch 16A at 12V DC.

The relay is enclosed in a plastic case and may be directly mounted on a pcb. Contacts are SPDT silver cadmium oxide. Dimensions: 30 x 13 x 27mm high excluding pins. Pin length: 3.5mm.



Contact Details:

Max current:	20A AC, 16A DC (make contact), resistive or inductive; 10A AC, 5A DC (break contact), resistive or inductive.
Max voltage:	240V AC, 28V DC
Life:	>100,000 operations
Operate time:	15ms
Release time:	10ms max

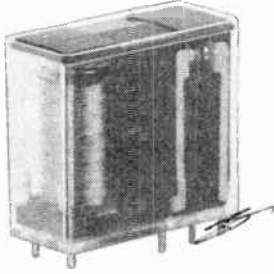
Coil Details:

Nominal voltage:	12V DC
Coil resistance:	106Ω
Operate voltage range:	9V to 14.4V

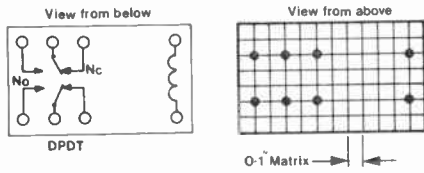
Order

YX99H (12V 16A Relay)	£3.20
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6 and 12V 6A Miniature Relays



Double pole double throw changeover relays with either 6V or 12V coils, and which are also used in our PWM Motor Drive Module. Construction is similar to 12V 16A relay above. Dimensions: 30 x 13 x 27mm high excluding pins. Pin length: 3.5mm.



Contact Details:

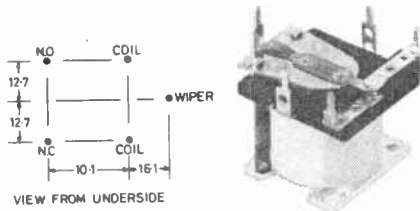
Max current: 6A AC/DC max
Max voltage: 250V AC, 30V DC

Coil details: 6V 12V
Nominal voltage: 6V 12V
Coil resistance: 70Ω 250Ω
Operate voltage range: 4.7 - 10.8V 8.6 - 20.5V

Order

FX42V (Min 6V 6A Relay) £2.95
FX43W (Min 12V 6A Relay) £2.95

Open Relay



Miniature relay for direct printed circuit mounting. Fitted with a single pole changeover contact silver-plated. Please note that the relay frame and the moving contact are electrically connected. Will switch mains up to 4.5A.

Contact Details:

Max. power: DC 150W, AC 1100VA 50Hz
Max. current: AC or DC 5A
Max. voltage: 240V AC, 24V DC
Contact capacitance: 2pF (approx)
Max. contact resistance: 30mΩ
Life: >10 million operations
Operate time: Break contact opens in <12ms, make contact closes in <16ms
Release time: 2ms (approx)
Insulation resistance: >10⁹Ω

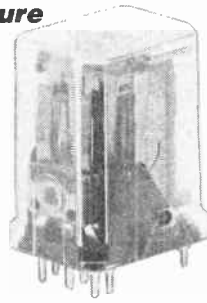
Coil Details:

Nominal coil voltage	Operate voltage range	Must release voltage	Coil resistance
6V	4.8 to 35V	1V	410Ω
12V	9.6 to 69.8V	2V	1640Ω

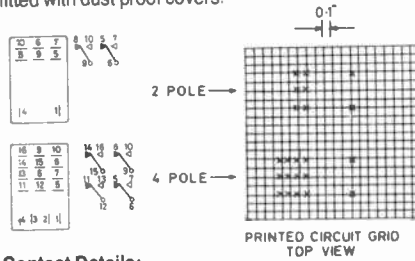
Order

FX23A (Open Relay 6V) £3.95
FX24B (Open Relay 12V) £3.95

Sub-Miniature Relay



Picture shows 4-pole relay, 2-pole types have printed circuit tags. A sub-miniature cradle relay. 2 pole types are designed for direct pcb mounting. Four pole type has solder tag connections. All relays are fitted with dust proof covers.



Contact Details:

2-pole or 4-pole changeover gold-flashed silver.
Max. power: DC 30W, AC 100VA
Max. current: DC 1A, AC 2.5A
Max. voltage: DC 100V, AC 120V
Life: >10⁸ operations
Operate time: 6ms
Release time: 3ms

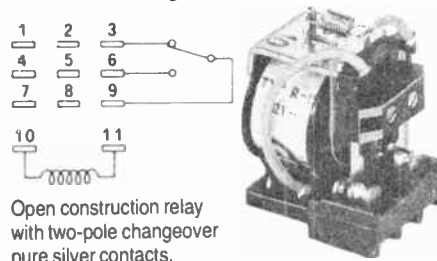
Coil Details:

Nominal coil voltage	Number of poles	Operate voltage range	Coil resistance
6V	2	2.6 to 8.8V	52Ω
12V	2	5 to 16.7V	185Ω
12V	4	8 to 16.7V	185Ω

Order

FX26D (2p Sub-Min Relay 6V) £2.80
FX27E (2p Sub-Min Relay 12V) £2.80
FX30H (4p Sub-Min Relay 12V) £3.95

Power Relay



Open construction relay with two-pole changeover pure silver contacts.

Contact Details:

Max ratings: 7.5A at 250V AC
3A at 440V AC
7.5A at 6V DC
7A at 12V DC
4.5A at 24V DC
1.5A at 48V DC
0.3A at 100V DC
0.15A at 200V DC
Life: >20 million operations
Operate and release time: 10 to 20ms

Coil Details:

Nominal coil voltage	Operate voltage range	Coil resistance
12V DC	9.6 to 13.2V	120Ω
230V AC	184 to 253V	7300Ω

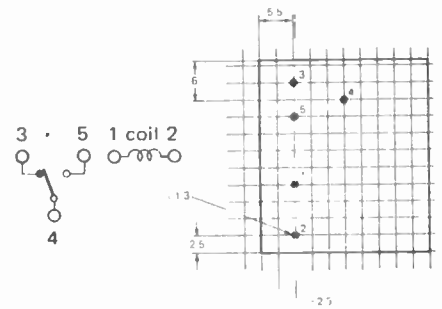
Order

FX48C (Power Relay 12V) £3.85
FX49D (Power Relay 230V AC) £3.95

8A Relay



A printed circuit mounting power relay with one changeover contact with cadmium oxide flashed silver contacts. The relay is fully enclosed in a plastic case. Size: 28.5 x 25.5 x 10.5mm + 3.5mm pin length.



Contact Details:

Max current: 8A (resistive load)
5A (inductive load)
Max voltage: 250V AC, 18.5V DC
Max contact resistance: 30mΩ
Life: >100,000 operations at 8A
Operating time: 8ms
Release time: 4ms

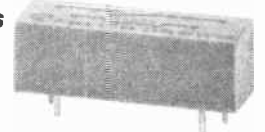
Coil Details:

Nominal voltage: 12V DC
Coil resistance: 330Ω

Order

HY20W (Relay Flat 12V) £1.95

Reed Relays



A reed relay with one make contact encapsulated in a moulded outer case. Pins fit directly onto a 0.1 inch grid.



Contact Details:

Max. power: 5W
Max. current: 200mA
Max. voltage: 50V
Contact capacitance: <2pF
Max. contact resistance: 150mΩ
Life: >5 million operations
Operate and release time: 1ms (approx)
Insulation resistance (between coil and either contact and between contacts): >10¹⁰Ω

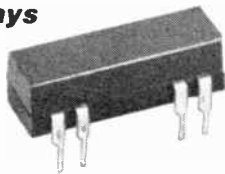
Coil Details:

Operate voltage range	Coil resistance	Body colour
6 to 9V	700Ω	Green
9 to 12V	1kΩ	Blue

Order

FX50E (Reed Relay 6 to 9V) £1.95
FX51F (Reed Relay 9 to 12V) £1.95

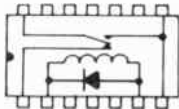
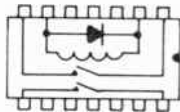
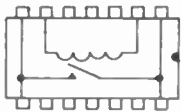
DIL Reed Relays



A reed relay with single pole or double pole make or single pole changeover contacts moulded in a standard 14-pin dual-in-line package.

Contact Details:

	1 pole make	2 pole make	1 pole change-over
Max power	10W	3W	4W
Max current	0.5A	0.11A	0.2A
Max voltage	100V	28V	100V
Contact capacitance	2pF	2pF	2.5pF
Max contact resistance	100mΩ	200mΩ	150mΩ
Life (millions of operations)	100	100	100
Operate time	0.25ms	0.25ms	0.5ms
Release time	0.15ms	0.15ms	1.3ms
Insulation resistance	10 ⁹ Ω	10 ⁹ Ω	10 ⁹ Ω



Coil Details:

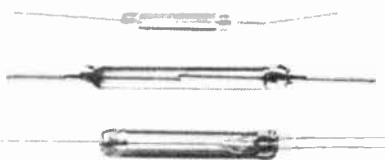
Type	Nominal coil voltage	Operate voltage range	Must release voltage	Coil resistance
1 pole make	5V	3.7-7.5V	0.5V	500Ω
1 pole make	12V	9-18V	1V	900Ω
2 pole make	5V	3.7-7.5V	0.5V	200Ω
2 pole make	12V	9-18V	1V	500Ω
1 pole c/over	12V	9-18V	1V	500Ω

All types have an internal diode connected across the coil to protect the driver. The 5V types may be driven directly from TTL and the 1 pole make 12V version may be driven directly from some CMOS devices operating at 15V.

Order

FX88V (Dil Reed Relay 1p 5V)	£1.55
FX89W (Dil Reed Relay 1p12V)	£1.95
FX90X (Dil Reed Relay 2p 5V)	£2.95
FX91Y (Dil Reed Relay 2p12V)	£3.45
FX93B (Dil Rd Rly 1p C/O12V)	£6.95

Reed Switches



A dry-read switch with rhodium plated contacts for long life. When a magnet or electromagnet is brought near the reed, magnetism is induced into both halves of the reed in the same direction. Thus, of the overlapping ends, one becomes a north pole and one a south pole and the attraction of the poles causes the switch to close. When the operating magnet is removed, the springiness of the reed enables the switch to break.

Type	Standard	Compact	Miniature
Glass length (mm)	50.8	38.8	20.3
Glass diameter (mm)	5.5	5.5	3.2
Overall length (mm)	84	88	57.2
Contact arrangement	Single pole make	Single pole changeover make	Single pole make
Max power	25W	10W	15W
Max current			
AC or DC	2A	0.5A	0.5A
Switching voltage DC	400V	100V	200V
Switching voltage AC rms	300V	125V	125V
Operate ampère-turns	40-80	50-90	20-50
Contact capacitance	0.8pF	3pF	0.2pF
Max contact resistance	70mΩ	100mΩ	150mΩ
Life (millions of operations)	100	100	100
Operate time	2ms	2ms	1ms
Release time	0.2ms	4ms	0.2ms
Insulation resistance	10 ¹⁰ Ω	10 ¹⁰ Ω	10 ¹¹ Ω

Order

FX68Y (Reed SW Standard)	80p
FX69A (Reed SW Compact)	£2.40
FX70M (Reed SW Miniature)	78p

Magnets

Magnets for use with our Reed Switches.

Small: 18.5 x 3.2 x 3.2mm
Large: 25.2 x 6.3 x 6.3mm



In the table below the distance in mm is that when the reed just operates and just releases when the wide face of the reed is parallel to a long face of the magnet and is measured from the centre of the reed to the nearest face of the magnet. In practice reduce the operate distance and increase the release distance by 25% to ensure reliable operation.

Magnet Large	Standard	Compact	Miniature
Operate distance	22mm	19mm	26mm
Release distance	36mm	29mm	36mm
Magnet Small	Standard	Compact	Miniature
Operate distance	6mm	5mm	10mm
Release distance	12mm	9mm	15mm

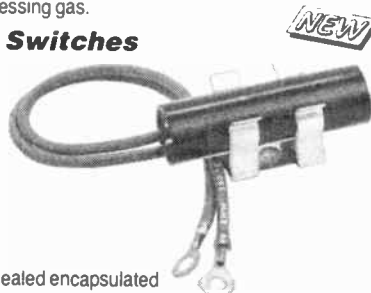
Order

FX71N (Magnet Small)	60p
FX72P (Magnet Large)	£1.20

MERCURY SWITCHES

These mercury switches comprise an encapsulation containing a pair of contacts, bridged by a ball of mercury which is free to roll about the interior. Thus the on/off state of the switch is dependant on the attitude of the switch relative to gravity. The encapsulations are sealed and filled with an inert, arc suppressing gas.

Tilt Switches



Two sealed encapsulated mercury tilt switches which find applications in sensing angles of position for machine control, angular movement detectors, etc.

The switches are finished in black and include a mounting clip. Each is fitted with a pair of 14cm long leads terminated in 4BA (M5) crimped ring tags.

Specifications:

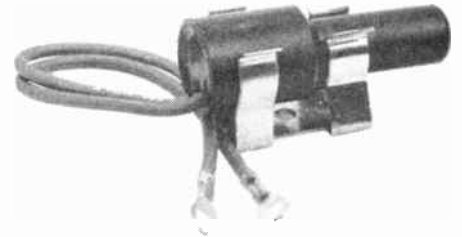
Type	G5Z-003	G10Z-003
Included angle*	11° max.	9° max.
Contact rating	5A @ 240V AC 4A @ 240V DC	19A @ 240V AC 10A @ 240V DC

Insulation Strength:

Contact to contact, off state	1500V	3000V
Encapsulation	5000V	5000V

Dimensions:

Length	46mm	61mm
Diameter	13mm	21.5/13.5mm



*Max included angle = degree of movement from position to guarantee an 'off' state through horizontal to position to guarantee an 'on' state.

Order

FA74R (5A Mercury Tilt Sw)	£7.95
FA75S (19A Mercury Tilt Sw)	£9.95

Tip-Over Break Contact Switches



A pair of mercury switches in nickel plated steel encapsulations. These switches are designed to be installed such that they are normally 'on' whilst 'upright', and break contact if tilted off vertical.

Safety Supply Breaker Type

The T03-1016 finds applications in free standing electric heaters for example, and will turn off the appliance should it fall over. The switch is terminated with a right-angled 'Lucar' blade at top and a 'Lucar' terminal at the side, suitable for use with our push-on connectors in the Connectors Section.

Motion Break Contact Switch

The 4539 is a tip-over switch which can be used in security applications to detect vibration or for detecting motion. It is quite sensitive to side-ways and vertical displacement, and will break contact if moved or knocked sharply. The switch remains closed for gentle movements. The break angle ensures 'normal' operation of the sensing circuit for any angle up to >79° relative to absolute vertical. The vertical terminals are 7mm long pins spaced at 2.5mm.

Specifications:

Type	T03-1016	4539
Break angle	45°	79°
Contact rating	6A @ 240V AC	1.7A @ 120VAC

Insulation strength:

Contact to contact, open	1240V	500V
Overall height	23mm inc. tag	16mm inc. pins
Overall diameter	23mm	15mm
	excluding side connector	

Order

FA76H (45deg Tipover Switch)	£1.98
FA77J (79deg Tipover Switch)	£1.98

TEST GEAR

Audio Oscillator	408
Capacitance Meter	409
Clamp Meter	414
CMOS Tester	408

Continuity Tester	408
Frequency Counter	407
IC Test Clip	406
LCR Bridge	408

Multimeters	409
Oscilloscopes	406
Signal Generator	408
Transistor Testers	408

PROBES

Test Prod

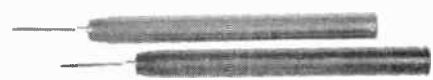


A test prod with integral 4mm socket. Overall length: 107mm. Available in red or black.

Order

HF19V (Test Prod Black)	65p
HF20W (Test Prod Red)	65p

Solderable Test Prods



A pair of test probes with plastic body, one red and one black, which can be unscrewed so that a cable can be soldered into the threaded well of the tip. Together with the required wander plugs or crocodile clips, and using preferably extra-flexible wire, it is possible to make up your own test leads to your own specifications. The prods have 27mm long tips with 100mm long x 10mm diameter handles.

Order

FK32K (Solder Test Prods)	45p
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Probe Clip



Probe with a positive spring-loaded hook grip for use in confined spaces. Fully insulated, with acetal mouldings and gold-plated contact. Screw or soldered connections. One red and one black. Supplied in pairs only. Overall length 83mm.

Order

HF21X (Probe Clips)	£1.10
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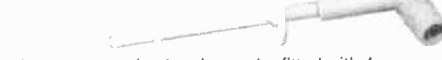
Miniature Probe Clips

Ideally suited for use with our extra flexible wire, these miniature probe clips feature a spring loaded wire hooked probe which retracts into the probe moulding. Housing is nylon with phosphor bronze probe clip. Length: 55mm. Max. voltage: 500V DC/AC. Insulation resistance: 100mΩ. Available in Black, Green and Red. Sold individually.

Order

YX57M (Min Probe Black)	38p
YX59P (Min Probe Green)	38p
YX60Q (Min Probe Red)	38p

Pistol Probes



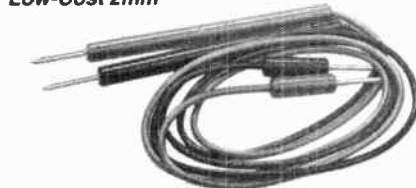
A heavy duty pistol-action probe fitted with 4mm socket. Jaws have a very strong grip and open to 4mm at points. Overall length: 154mm. Available in red or black.

Order

HF30H (Pistol Probe Black)	£1.20
HF31J (Pistol Probe Red)	£1.20

Test Probe Leads

Low-Cost 2mm

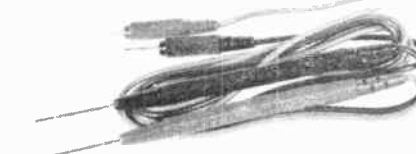


A red and black test lead pair. Terminated in 2mm plugs to suit many multimeters etc. Other end terminated in test prods. Heavy duty extra-flexible PVC covered wire 650mm long.

Order

HF22Y (Lo-Cost Test Probe)	85p
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Moulded 2mm

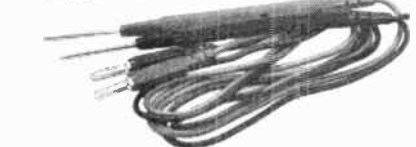


A red and black test lead pair. Terminated in 2mm plugs to suit many multimeters etc. Other end terminated in heavy duty moulded PVC test prods. Heavy duty extra-flexible PVC covered wire 750mm long.

Order

HF32K (Moulded Test Probe)	78p
----------------------------	-----

Moulded 4mm

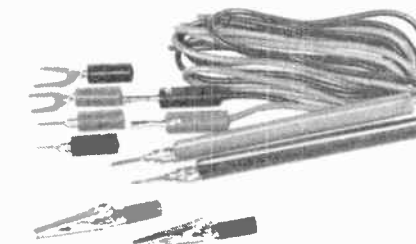


A red and black test lead pair. Terminated in moulded 4mm plugs with 4mm socket in the plug. Other end terminated in heavy duty moulded PVC test prods. Heavy duty extra-flexible PVC covered wire 850mm long.

Order

HF33L (4mm Test Probe)	85p
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Test Lead Kit



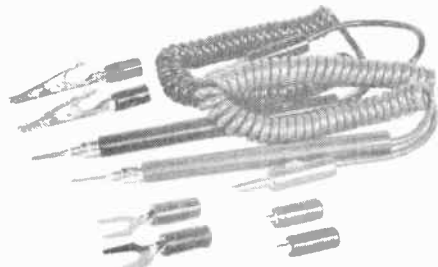
A universal test lead kit comprising one red and one black extra-flexible lead 1.2m long, and terminated in a 4mm plug at one end and a test prod at the other; the test prod having a 20mm long tip in a 105mm long x 9mm diameter handle. The 4mm plugs can be plugged into one of three alternative terminations comprising 4mm (minimum) spade terminals, 38mm

long crocodile clips (maximum gape 8mm), or 13mm long x 2mm diameter needle point plugs, all red/black colour matched pairs.

Order

FK21X (4mm Test Lead Kit)	£2.60
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Coiled Test Lead Kit



A test lead kit identical with the above, but having stretchable coiled cables. The cables are 350mm long in the fully relaxed condition but will stretch to a total usable length of 1.5 metres.

Order

FM60Q (Curly Test Lead Kit)	£2.95
-----------------------------	-------

LOGIC PROBE



A logic probe for use with DTL, TTL and CMOS IC's. Simply connect crocodile clips to power supply for IC's to be tested (up to 18V max) then touch probe on pin to be tested. If a high level (logic 1) is present, red lamp lights; if a low level (logic 0) is present, clear lamp lights. Supplied with 900m lead.

Specification:

Voltage range:	4.5V to 18V
Max supply voltage:	0 to 18V DC
Input impedance:	>100kΩ
Supply current:	35mA at 18V
Min detectable pulse width:	20ms

Probe is protected against input overload, negative input and reverse polarity supply voltage. Probe has grey plastic body with finger guard. Overall length: 195mm. Diameter: 15mm

Order

FY73Q (Logic Probe)	£14.95
---------------------	--------

SIGNAL INJECTOR



A signal injector with a very wide bandwidth. Speeds up troubleshooting on all kinds of electrical and electronic equipment. Supplied with instructions and battery (replacement type HP7)

Order

FL61R (Signal Injector)	£3.95
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IC TEST CLIP



A very useful tool for testing dual-in-line IC's up to 16-pin. Simply clip the spring-loaded tool over the IC in situ and connect test probes, clips etc. to the pins at the top. Size: 45 x 22mm.

Order

FY74R (IC Test Clip) £2.80

QUICK MAINS CONNECTOR

A completely safe way of connecting mains cables to the power supply without having to fit plugs. The wire ends of the cable simply fit under three clips which are exposed when the lid is lifted. With lid lifted it is not possible to touch any live part. When lid is closed all live parts are fully enclosed and mains is connected to the clips and thus to the cable.



Specification:

Max rating: 13A, 240V AC
Size: 127 x 67 x 51mm high.
Weight: 340gms (12oz)

Order

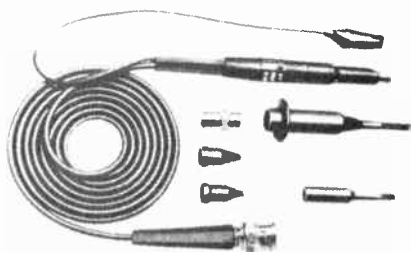
YB21X (Quick Mains Connectr) £7.95

Safeloc Quick Mains Connector

Safeloc is the trade mark of Rendar Limited of Durban Road, Bognor Regis, West Sussex, and has been used by Rendar on a Quick Mains Connector that Rendar have been making and selling for many years. In our 1985 catalogue, page 408, we listed under the name Safeloc a Quick Mains Connector under stock no. YB21X. The connector illustrated in that item was in fact not a genuine Safeloc connector from Rendar Limited and furthermore connectors supplied by us to orders for item YB21X were not genuine Safeloc connectors. Rendar have asked us to inform purchasers of our stock item YB21X from our 1985 catalogue that there is no connection between Rendar and any Quick Connectors which may have been supplied to orders for stock item YB21X which did not carry the name Safeloc on the product or packaging for the product. We apologise unreservedly to Rendar for this misuse of their trade mark Safeloc.

OSCILLOSCOPES

Oscilloscope Probe



A very high quality probe suitable for use with almost any oscilloscope. Probe has a slide switch on body for immediate selection of either times 10 or times 1 or ground for instant position reference.

Specification:

Bandwidth: DC to 70MHz
Rise time: <5ns
Overshoot: <3% Switch
functions: 10:1 attenuation, $\pm 1\%$ with 'scope of $1M\Omega$ input resistance.
1:1 attenuation with bandwidth of 10MHz approx.

Reference position, tip grounded via $9M\Omega$, 'scope input grounded.

Input capacitance: 12pF typical, depends on 'scope input capacitance. May be used with 'scopes of up to 45pF input capacitance by adjusting trimmer in probe body. Trim tool supplied.

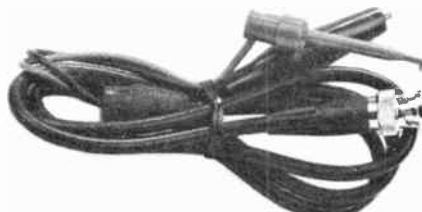
Working voltage: 500V DC, 350V AC rms.

The probe is supplied with an ultra-flexible screened lead fitted, and an earth lead with crocodile clip attached. Lead is 1.2m approx. long. Supplied in strong seal-top plastic wallet with accessories: retractable sprung hook with fully insulating sleeve, insulating tip, IC test tip, trimming tool and BNC adaptor.

Order

BW05F (Scope Probe BNC) £14.95

Low-Cost Scope Probe



A 50Ω co-axial lead connected to a 50Ω BNC plug at one end and a red probe clip with spring loaded hook and a black crocodile clip at the other end. Length 900mm.

Order

YR95D (Lo-Cost Scope Probe) £2.95

Using Oscilloscopes

The Cathode Ray Oscilloscope (CRO), or scope, is probably the most useful of all the instruments available to the electronics enthusiast. It can serve as an AC or DC voltmeter, a time and frequency meter, a phasemeter, and, with a few extra components, a current and power meter. This flexibility in use is what makes the CRO so important in all fields of electronics, from DC power supplies to RF communications.

DC and AC Voltage Measurements

DC voltage measurement is just a case of grounding the input, selecting DC coupling, setting the V/cm control to a suitable value, and positioning the trace on one of the grid lines. Applying the probe to a point on a circuit will give a deflection which can be interpreted as a voltage using the scale (remember to connect the ground lead to zero or ground potential). If an AC voltage is present the waveform can be seen, and its peak-to-peak value obtained. This is the voltage from the top to the bottom of the waveform. Most voltmeters are calibrated in RMS (root mean square) volts, and so if an RMS reading is wanted it must be converted. For a sinusoidal voltage the RMS value is 0.707 times the peak value, which is in turn half the peak-to-peak value, e.g. a waveform of peak-to-peak value 10V has a peak value of 5V and an RMS value of 3.535V. Most scopes have a switch which allows the input to be either AC or DC coupled. When in the DC position both DC and AC voltage can be measured, but if there is only a small AC voltage with a comparatively large DC component (as with ripple on a DC supply) it may be difficult to measure the AC component. By switching to AC coupling the DC can be removed and the AC can be easily measured.

Period and Frequency

As the X-axis is calibrated in time, it is just as easy to measure the period, and hence the frequency, of a waveform. Once a stable display is obtained, using the trigger controls, the period can be measured as

the time taken for a given point in a waveform to re-occur, e.g. if a waveform completes one cycle in one cm on the screen and the time/division selector is at 1ms per cm, then the period is one millisecond, and the frequency, given by the reciprocal of the period time, will be 1kHz.

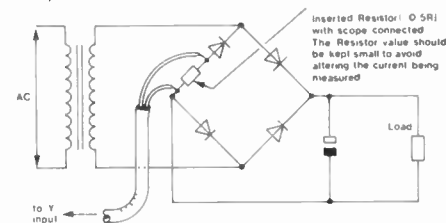


Figure 1. Using a resistor to see a current waveform

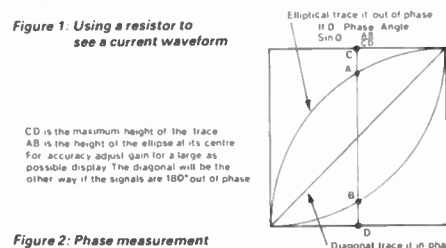


Figure 2: Phase measurement using Lissajou figures

Current

Time and voltage measurement are the basic functions of an oscilloscope, but it is not difficult to use it for other purposes. If you need to see a current waveform, then a known resistor, small enough not to greatly affect the circuit under test, can be put into the circuit, and the scope connected across the resistor. The voltage waveform on the screen will then be proportional to the current flowing in the resistor, as $V = IR$. (See Figure 1.) A current probe uses a different principle which does not affect the circuit, but these are very expensive, certainly much dearer than a resistor, and are not widely available.

Phase

Another quantity of interest is phase. This can be seen on a scope by displaying the waveforms on a dual beam scope (preferably using chopped mode) and measuring the time displacement by direct comparison. An alternative can be used when there is an external X input and both waveforms are sinusoidal. The two signals are fed to the X and Y inputs, producing what is known as a Lissajou figure. This will be a diagonal if the signals are in phase, but will appear elliptical if there is a phase difference. Figure 2 shows the display and how to obtain the phase angle value.

Single and Dual Beam Oscilloscopes

Two superb, high quality, portable oscilloscopes, ideal for constructors, schools and service engineers. These scopes have excellent accuracy, yet are simple to use. Both scopes feature a bandwidth from DC to 15MHz and have a built-in component tester, which extends the abilities beyond those of normal scopes. In this mode both passive and active components, including diodes, transistors, and FETs can be tested either in or out of circuit. Resultant component characteristics are instantly displayed on the CRT. Undoubtedly the Component Tester substantially increases the use of these scopes as test and trouble shooting instruments.

Single-Beam Oscilloscope

Vertical Deflection

Deflection Coefficient: 2mV/div to 10V/div in 12 calibrated steps (1,2,5 sequence).
Accuracy: 3%
Bandwidth: DC - 20MHz (-3dB) DC coupled.
10Hz - 20MHz (-3dB) AC coupled.
Rise Time: 18ns
Input Impedance: $1M\Omega$ and 25pF (approx).



Maximum Input Voltage: 400V (DC + Peak AC)

Horizontal Deflection

Sweep Speeds: 0.5µs/div to 200ms/div in 18 calibrated steps (1,2,5 sequence).
Accuracy: 5%
Variable: Extends maximum sweep rate to approx. 40ns/div continuously variable between calibrated steps.

External Horizontal Amplifier

Deflection Coefficient: 400mV/div within 10%
Bandwidth: 4Hz - 1MHz (-3dB)
Input Impedance: 1MΩ and 25pF (approx).
X-Y Operation: Input via external trigger socket.

Triggering

Modes: Automatic or manual level selection. Automatic operation minimises trigger adjustments and provides bright base line in the absence of an input signal.

Slope: Positive or negative
Source: Internal or external

Sensitivity, Internal: 0.5 div from 10Hz to 1MHz decreasing to 1 div at 20MHz. Typical 0.4 div at 25MHz.

External: 0.5V from 10Hz to 1MHz decreasing to 1V at 25MHz.

Component Tester

Test Voltage: 8.6V. Test Current: 28mA max.

Display

95mm diagonal flat faced rectangular CRT P31 Phosphor 1kV accelerating potential, 8 x 10 div display area non illuminated red line graticule on greenish blue filter. Each div is 0.66cm. Calibrator: Output provided, 1kHz at 200mV p-p, for probe compensation. All accuracies claimed at 25°C. Trace Rotate: Control located on back panel allows 5° of adjustment.
Power Requirements: 110V/220V/230V/240V 47Hz - 65Hz 18VA.

Dimensions and Weight

Height: 125mm Width: 240mm Depth: 317mm. Net weight: 4.6kg without accessories.

Accessories

Included Accessories: Instruction Manual. Input Lead, and power cord.

Order

XB82D (Crotech 3031) £234.00

Delivery by Carrier. By mail-order please add carriage charge £5.50.

Dual Beam Oscilloscope

Vertical Deflection (two identical channels)

Bandwidth: DC - 20MHz (-3dB) DC coupled.
10Hz - 20MHz (-3dB) AC coupled.
Rise time: 17ns or less.

Deflection Coefficient: 2mV/div to 10V/div in 12 calibrated steps (1,2,5 sequence).
Accuracy: 3%

Display Modes: Channel 1 only, CH1 and CH2 alternate or chopped mode (250kHz). Algebraic addition CH1 + CH2, Algebraic Subtraction CH1 - CH2, CH1 Invert and X-Y.

Input impedance: 1MΩ and 25pF (approx).

Max. Input Voltage: 400 (DC + Peak AC)
Internal Trigger signal: CH1 or CH2 signal.

Horizontal Deflection

Sweep Speeds: 0.5µs/div to 0.25s/div in 18 calibrated steps (1, 2, 5 sequence)

Accuracy: 5%
Variable: x5 expands fastest sweep signal to 100ms/div. operable on timebase ranges.

Deflection Coefficient: Same as CH1
Bandwidth: DC - 1MHz (-3dB).
Input Impedance: Same as CH1.



Triggering

Modes: Automatic or normal with level selection. Automatic operation minimizes trigger adjustment and is useful above 30Hz. With no input automatic triggering provides a bright base line at all sweep rates. CH1 or CH2, Line or Ext, TV (frame), and TV (Line).

Slope: Positive or Negative.
Sensitivity: 0.5 div deflection or 1V p-p external signal up to 20MHz in Auto mode 2 div deflection or 3V p-p external signal from 10Hz to 20Hz in Normal mode. Typical 1 div at 35MHz in Auto or Normal mode.

Coupling: AC or DC, HF reject.

Component Tester

This unique feature incorporates two component testers which can be used as comparators for checking both active and passive components, or as a circuit signature comparator.

Test voltage: 8.6V rms
Test current: 28nA max.
Test frequency: 50 or 60Hz DC Source:

Triple output DC source available on 2mm sockets mounted on the front panel. +5V output, Ve grounded, 1A max, ±1% regulation. +12V and -12V Dual Source: Common terminal floating, 200mA max on each outlet. (+24V or -24V output possible by earthing appropriate socket).

Display

130mm flat faced Mono accelerator CRT with P31 Phosphor.
Z Modulation: 20V pp signal up to 1MHz modulates at normal intensity.
Graticule: 8 x 10 div blue non-illuminated. Vertical and horizontal centre lines marked in 5 minor divisions per major division

Calibrator: Amplifier Calibrator 0.2V at External socket accurate within 2%, output resistance 50 ohms. All accuracies claimed at 25°C.

Trace Rotate: Control located on rear panel allows 5° of adjustment.

General Information

Power: 110V/220V/230V/240V.
47 - 65Hz 23VA

Size: 215 x 425 x 265mm. Weight: 8.5kg
Accessories included: Power Cord, Instruction Manual, Input Leads.

Order

XB83E (Crotech 3132) £367.80

Delivery by Carrier. By mail-order; please add carriage charge £5.50.

Low Cost Frequency Counter



A low-cost frequency counter capable of measuring frequencies from 5Hz to 50MHz, in multiples of 10Hz. This is a real pocket-size instrument, with a 4-digit 10mm high red LED display, and is battery powered. The 4-digit display has a range switch, which allows up to a 7 digit accuracy. Includes battery low indicator and flashing unit sign. Supplied with BNC terminated coaxial test lead. Dimensions: 111 x 36 x 125mm. Weight: 500gms.

Input Impedance: 1MΩ plus 20pF
Input sensitivity: 60mV
Input frequency range: 10Hz to 50MHz
Power supply: 6 AA size batteries or external 9V DC @ 100mA.

(There is also an 8-digit, 10Hz to 600MHz frequency counter kit, details of which can be found in the Projects and Modules section.)

Order

YK38R (Low-Cost Counter) £69.95

RF Digital Frequency Meter



A ready-built digital frequency meter ideal for use with CB or amateur radio equipment. The meter has a range extending from 1kHz to 500MHz in two ranges and operates from a 12V DC source making it ideal for mobile use. It has a 5-digit display.

Specification

Frequency range: 1kHz to 500MHz
Low range (50MHz): 1kHz to 55MHz
High range (500MHz): 5MHz to 500MHz
Input sensitivity: 18mV
Max input voltage: 20V peak-to-peak
Accuracy: ±0.002% (0°C to 40°C)
Power supply: Requires 12V DC (8 to 15V) at 250mA
Connector: SO233 output socket
Size: 160 x 60 x 55mm

Order

YK01B (RF Frequency Meter) £67.95

LCR Bridge

This instrument will determine the value of resistance, capacitance or inductance of any device connected to it, using a bridge nulling technique. It is fully built and tested. It has six ranges for each function allowing readings to be made (assuming one can read to a tenth of a large division) from 0.1Ω to 1MΩ, 10pF to 100μF, 1μH to 10H.

Ranges:

Resistance 10Ω, 100Ω, 1kΩ, 10kΩ, 100kΩ, 1MΩ.

Capacitance 1000pF, 0.01μF, 0.1μF, 1μF, 10μF, 100μF.

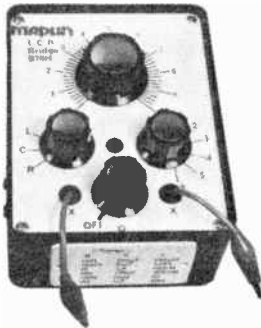
Inductance 100μH, 1mH, 10mH, 100mH, 1H, 10H.

Accuracy: ±2%

Requires one PP3 battery (not supplied).

Order

YB82D (LCR Bridge) £29.95



Signal Generator

A Wein Bridge oscillator fully built and tested giving high purity sine or square wave outputs with frequency and amplitude adjustable.

Robust, lightweight, simple to use, yet its specification is better than many instruments of far higher price.



Specification

	Sine wave	Square wave
Output voltage (max)	1V rms	9V peak-to-peak
Frequency range	15Hz to 200kHz	15Hz to 100kHz (then to 200kHz non-linear with scale)

Total harmonic distortion: 0.5%.

Output via 4mm terminals. Size: 127 x 102 x 51mm.

Requires one PP3 battery (not supplied).

Order

YB81C (Signal Generator) £29.95

Hand Held Transistor Tester



A transistor tester that will indicate the condition of a PN or NP junction of a semiconductor device whether it be in or out of a circuit. Provided that the

circuit equivalent parallel resistance is greater than 330Ω, or the shunt capacitance is less than 47μF, then the tester will determine the integrity of the semiconductor under test. As well as all transistors diodes, rectifiers, LED's and SCR's can be tested. The tester uses only two probes, and a flashing LED indicates an operational, open or short circuit junction as well as the polarity. Uses one PP3 style battery (not supplied). Size 120 x 61 x 20mm. Fitted with red and black test leads 850mm long, terminated with probes.

Order

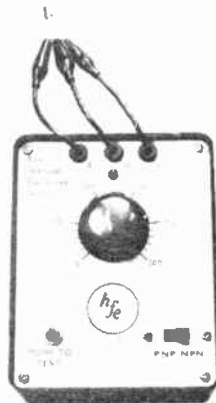
FK50E (Handheld Trans Testr) £29.95

Transistor Tester

A very low cost yet very accurate fully built and tested transistor tester which measures dynamic gain (h_{fe}). The tester is ideal for matching transistors into pairs and for testing suspect transistors. It can also be used to identify "unknown" transistors. It is supplied complete with full instructions for use. Powered by PP3 battery (not supplied). To insert battery, remove four screws in front panel and take tester out of case. Fit battery and replace.

Order

LH05F (Transistor Tester) £19.95



CMOS Tester

A logic tester for CMOS devices, for use by the amateur and professional alike. The tester takes the form of DIL sockets on the front panel for the device under test, which can be connected to a number of CMOS compatible outputs and output logic state indicators, by means of the thirteen patch leads supplied. These test points consist of:-

- Four logic '1' outputs
- Four logic '0' outputs
- One 1Hz square wave
- One 100Hz square wave
- One pushbutton (non-latching push to make release to break) for manual logic '1' pulse output
- Eight LED logic state indicators to monitor outputs of the device under test
- One +V (supply)
- One 0V (0VE)

A booklet of fact sheets is also provided outlining testing procedures for some of the more common devices, for example:-

CMOS devices included in the Fact Sheets—

4000	4015	4025	4069
4001	4016	4027	4070
4002	4017	4028	4071

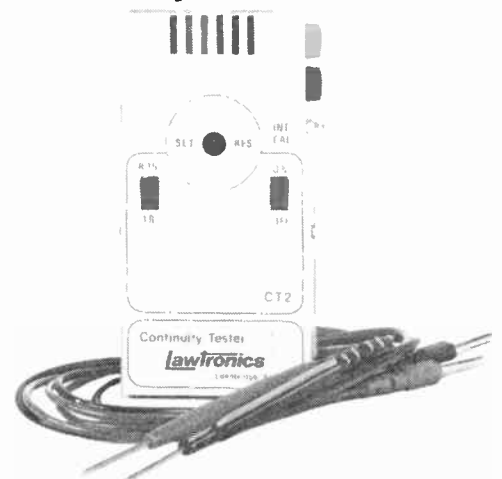
4006	4018	4030	4073
4008	4019	4031	4077
4009	4020	4040	4081
4010	4021	4042	4082
4011	4022	4047	4093
4012	4023	4049	4095
4014	4024	4050	4502

Although not all CMOS devices are covered in the fact sheets, it should be possible to develop your own test procedures using the methods shown in the booklet.

Order

YK40T (CMOS Tester) £37.95

Continuity Tester



A low power continuity tester which 'measures' the resistance of the conductor under test. An internal reference may be preset in the range 0.1 to 3Ω, by which means the tester will make a comparison and sound a buzzer if the impedance of the conductor under test is below this threshold. The voltage drop across the test probes will not exceed 25mV unloaded, and so the tester can be used safely with circuits containing semiconductors. An internal reference for preset test levels of 0.25 and 1.0Ω is available. Dimensions 120mm long x 60mm wide x 24mm deep overall. Test leads supplied. Requires two PP3 style batteries (not supplied).

Order

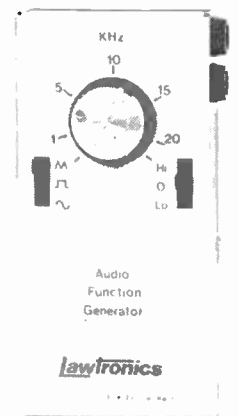
FM55K (Continuity Tester) £27.95

Audio Function Generator

A hand held battery powered AF Function Generator which will cover the range 20Hz to 20kHz. A three position switch selects either sine, triangular or square waveforms, and the single rotary control will scan the entire frequency band. Output is via two 4mm sockets, where any of the three waveforms are available at either 0.1V p-p or at 9V p-p. Output impedance is 50Ω. The unit measures 121mm long x 62mm wide x 28mm deep overall. Requires 2 PP3 type batteries (not supplied) to operate.

Order

FM57M (Function Generator) £49.95



Capacitance Meter

NEW



Powered by a single PP3 battery, this useful piece of test gear will be invaluable in determining the values of capacitors otherwise unknown. Simply insert the leads of the capacitor to be tested into the pair of 1mm sockets on top of the instrument, select the required range and press the button. The five ranges comprise –

FSD	Resolution
99.9 μ F	0.1 μ F
9.99 μ F	10nF
999nF	1nF
99.9nF	100pF
9.99nF	10pF

The display consists of a 3-digit 7-segment LED display with floating decimal point and an overrange indicator. A pair of short test leads terminated in 1mm plugs at one end and insulated crocodile clips at the other can be used for measuring components that cannot be used with the test sockets. Dimensions: 157 x 81 x 55mm overall. Weight: 200gms.

Order

YJ86T (Capacitance Meter)..... £49.95

MAPLIN PRECISION GOLD MULTIMETERS

STAR BUY

MAPLIN PRECISION GOLD

A range of very high quality multimeters having some models designed for home/hobbyist use and some for the professional. The meters in the range offer truly amazing quality at the price.

Pocket Multimeter



A rugged, easy to operate, general purpose multimeter having a sensitivity of 2000 Ω /V for DC and AC voltage ranges. Its compact size and ease of portability makes it ideal for those situations where fast, accurate measurements are required. Ideal for use in the house, boat, car etc.

Ranges:

DC volts:	10, 50, 250, 500V at 2000 ohms per volt
AC volts:	10, 50, 250, 500V at 2000 ohms per volt
DC current:	0.5, 50, 250mA
Resistance:	0 to 1M Ω (5k Ω at centre of scale) (Minimum reading: 200 Ω)

Decibels: –20 to +56dB,
using AC volts ranges

The meter has an accuracy of 4% at full scale deflection for DC and AC voltage ranges, and resistance measurements are accurate to 4° of scale arc. The two-colour mirrored scale has a total arc of 90°. Supplied complete with operating instructions, one red and one black test lead with probes and one battery (replacement type AA size). Dimensions 90 x 60 x 30mm. Weight: 110g.

Order

YJ06G (Pocket Multimeter)..... £6.95

Hobby Multimeter

NEW



The Maplin Hobby Multimeter is a rugged, easy-to-operate instrument offering 10,000 Ω /V DC and 4000 Ω /V AC sensitivity, with a linear meter movement which provides for accurate measurements of DC and AC voltages, direct currents, resistance and decibels on a 90° arc mirrored scale. The meter uses the most modern components and circuit techniques in a high impact case.

Specification

DC volts	0 to 0.25, 2.5, 25, 250, 1000V
AC volts	0 to 10, 50, 250, 1000V
DC current	0 to 0.1, 10, 500mA
Resistance	R x 10, R x 100, R x 1k
Decibels	–20dB to 62dB on AC volt ranges

The meter has an accuracy of 4% of full scale deflection for DC voltage ranges, and 5% for AC ranges. Resistance readings are accurate to 4% of scale arc. The 19 measuring ranges provided make this meter an ideal instrument for general purpose application, or for a beginner to electronics who needs an instrument that is not too difficult to operate but at the same time must have most of the basic functions.

Supplied complete with operating instructions, one red and one black test lead with probes and one battery (replacement type AA size). Dimensions: 105 x 62 x 32mm. Weight: 140gms

Order

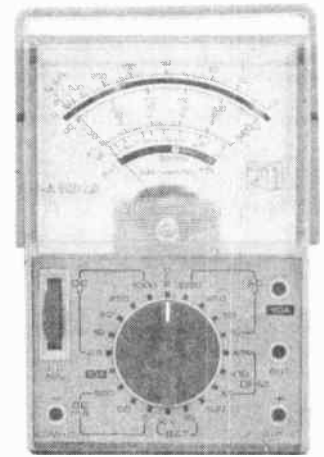
YJ76H (Hobby Multimeter)..... £8.95

Multimeter M-102BZ

A wide range multimeter having a 90° three colour mirrored scale and 40 μ A F.S.D sensitivity, with a double jewelled precision moving coil movement. A dual silicon diode overload protection system is included with a 1 Amp fuse. The meter has a sensitivity of 20,000 Ω /volt DC, and 8,000 Ω /volt AC. There are 23 measuring ranges.

Ranges:

DC volts:	2.5, 10, 50, 250, 1000V
AC volts:	10, 50, 250, 1000V
DC current:	5, 50, 500mA and 10A
Resistance:	0 to 10k Ω (50 Ω at centre of scale) 0 to 100k Ω (500 Ω at centre of scale) 0 to 10M Ω (50k Ω at centre of scale) (Minimum reading: 1 Ω)
Decibels:	–8dB to +62dB using AC V ranges



The M-102BZ has the additional facilities of a battery test function, for 1.5V cells and 9V power packs, and an audible buzzer so that the meter can be used as a continuity tester. It also has a separate audio input for decibel measurements with an impedance of 600 Ω .

During the battery testing functions the cells are loaded for a realistic result; the 1.5V cell under test is loaded with 75 Ω for 20mA, and the 9V battery under test is loaded with 450 Ω for 20mA.

The scale has an accuracy of 4% F.S.D for measuring DC volts, and 5% F.S.D measuring AC volts. When measuring ohms it is accurate to 4° of arc. A full instruction manual is included. The meter incorporates a rugged carrying handle that can also be used as a bench stand.

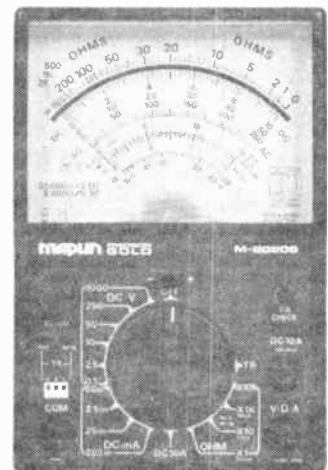
Supplied complete with operating instructions, one red and one black test lead with probes, and batteries (two size AA). Dimensions 133 x 89 x 38mm, not including handle. Weight: 255g.

Order

YJ07H (Multimeter M-102BZ)..... £14.95

Multimeter M-2020S

A professional quality, comprehensive multimeter having a 90mm, full 90° arc mirrored two-colour scale with a knife edge pointer needle. It features a sensitivity of 20,000 Ω /volt DC and 8,000 Ω /volt AC, with a rated accuracy of 3% of F.S.D for all ranges.



In addition to the usual multimeter functions this instrument also has a transistor and diode checking facility, which can determine transistor type (npn/pnp) and operational integrity, by means of one green and one red alternately flashing LED's, which are very easily interpreted. The green LED flashes if the transistor is an npn type that functions correctly, and the red flashes if it is a working pnp type. If the

transistor is open circuit, both flash. If there is a collector-to-emitter short circuit neither LED's will light. A front panel 3-pin socket is provided into which the transistor to be tested is inserted. The leakage current of the transistor can also be measured and the scale is marked to show defective types. The diode and LED testing facility uses the resistance ranges, with the added ability to test for reverse leakage current, and measure forward voltage drop.

Ranges:

- DC volts: 0.1, 2.5, 10, 50, 250, 1000V
- AC volts: 10, 50, 250, 1000V
- DC current: 50µA, 2.5, 25, 250mA, 10A
- Resistance: 0 to 2kΩ (20Ω at centre of scale)
0 to 20kΩ (200Ω at centre of scale)
0 to 2MΩ (20kΩ at centre of scale)
0 to 20MΩ (200kΩ at centre of scale)
(Minimum reading: 0.2Ω)
- Decibels: -10dB to +22dB (10VAC range)
+4dB to +36dB (50VAC range)
+18dB to +50dB (250VAC range)
+30dB to +62dB (1000VAC range)

Transistor

tester I_{CEO}: 15mA, 150mA

Diode and

LED Tester: 150µA, 15mA

The multimeter includes a polarity reversal switch, overload protection with 2A fuse, and a bench stand. Also has four non-slip rubber feet. Uses 2 x 1.5V AA and a 9V PP3 type battery, supplied. Full operating instructions and one red and one black test lead with safety probes and fully shrouded plugs are included. Dimensions: 150 x 100 x 45mm. Weight: 365g.

Order

YJ08J (Multimeter M-2020S) £19.95

Electronic Multimeter M-5050E

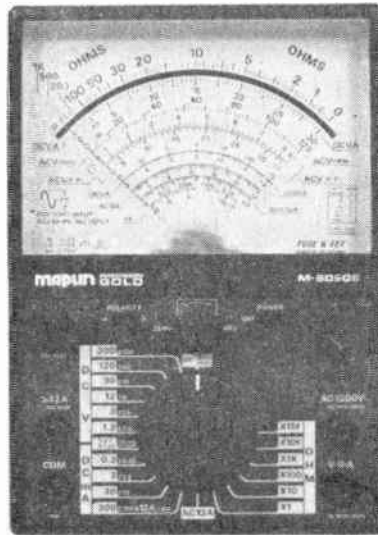
A professional quality, accurate, VVM type multimeter which uses FET input stages to present a very high input impedance and thereby negligible loading to the circuit under test. Also features a large, 114mm full 90° two-colour mirrored scale with a knife edge pointer needle. An extra rugged safety design complies with UL 1244 and VDE 0411. The meter movement, which has a 44µA FSD sensitivity and is supported in double jewelled bearings, is overload protected, in addition to a fuse and FET protection. The test probes have safety guard rings and fully shrouded plugs.

The meter will read DC volts down to 300mV FSD (minimum reading 5mV), which range has a 3MΩ input impedance, all other ranges being approximately 10MΩ. Rated accuracy is ± 2.5% DC. The meter will read DC currents down to 100nA FSD (minimum reading 2nA). Rated accuracy on the AC ranges is ± 3.5% of FSD on all ranges. AC input impedance is ± 1MΩ, shunted by 800pF, except the 3V AC range which is approximately 2.5MΩ.

This versatile multimeter is also calibrated to read peak-to-peak AC voltages as well as rms. In addition the meter pointer can be adjusted to centre scale so that + and - DC readings may be taken, for nulling and peaking for example. An LED indicates that batteries are in good condition. To change the batteries, remove the three screws in the back (two are under the top two rubber feet which pull out and simply clip back in).

Ranges:

- DC volts: 0.3, 1.2, 3, 12, 30, 120, 300, 1200V
±150mV, ±0.6, ±1.5, ±6, ±15,
±60, ±150, ±600
- AC volts 3, 12, 30, 120, 300, 1200V rms
8.4, 33, 84, 330, 840, 3300V p-p
- Decibels: -10dB to +63dB using AC ranges
- DC current: 0.1µA, 0.3, 3, 30, 300mA, 12A
±50nA, ±0.15, ±1.5, ±15,
±150mA, ±6A



AC current: 12A ±3.5% FSD

DC resistance: 0 to 1kΩ (10Ω at centre of scale)
0 to 10kΩ (100Ω at centre of scale)
0 to 100kΩ (1kΩ at centre of scale)
0 to 1MΩ (10kΩ at centre of scale)
0 to 10MΩ (100kΩ at centre of scale)
0 to 1000MΩ (10MΩ at centre of scale)
(Minimum reading: 0.1Ω)

The M-5050E also has a polarity reversal switch, and a power-on indicator LED. Uses 1 x 9V PP3 and 2 x 1.5V AA type batteries, supplied. Full instructions for use are included along with one red and one black test lead with safety guards and fully shrouded plugs. Dimensions 125 x 170 x 50mm. Weight 480g.

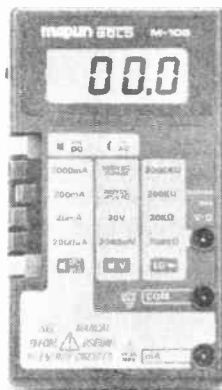
Order

YJ09K (Multimeter M-5050E) £34.95

DIGITAL MULTIMETERS Low Cost Digital Multimeter M105



This compact, easy-to-use multimeter offers digital accuracy at a low price. The 3½ digit LCD display has a basic accuracy of 0.5%, and the meter has an input impedance of 10MΩ. Complies with UL1244 and VDE0411, inputs are fully overload protected and circuitry is shielded against radio frequency interference. All resistance ranges will take 250V AC or 350V DC indefinitely without damage, and up to 350V AC or 500V DC for 30 seconds.



AC voltage inputs are protected up to 800V rms, and DC ranges to 1000V. Current ranges are protected by 2A fuse. When used to measure ohms the meter produces only 2.8V maximum across the probes if the latter are open circuit or too low a range is being used, preventing possible damage to delicate devices in the circuit being measured.

Specifications:

Ranges

DC Voltage:

Range	Resolution	Accuracy
2000mV	1mV	0.5% of rdg ± 2 digits
20V	10mV	0.5% of rdg ± 2 digits
200V	100mV	0.5% of rdg ± 2 digits
1000V	1V	0.5% of rdg ± 2 digits

AC voltage @ 45 to 450Hz

200V	100mV	± 1.2% of rdg ± 10 digits
750V	1V	± 1.2% of rdg ± 10 digits

DC current:

2000µA	1µA	±0.75% of rdg ± 2 digits
20mA	10µA	±0.75% of rdg ± 2 digits
200mA	100µA	±0.75% of rdg ± 2 digits
2000mA	1mA	±1% of rdg ± 2 digits

Resistance:

2000Ω	1 ohm	±0.75% of rdg ± 2 digits
20kΩ	10 ohm	±0.75% of rdg ± 2 digits
200kΩ	100 ohm	±0.75% of rdg ± 2 digits
2000kΩ	1k ohm	±1% of rdg ± 2 digits

The meter has sideways action push button range selector switches so that the meter can be held, and ranges switched, by one hand while the probe is being manipulated in the other. Supplied with operating instructions, one battery (replacement type PP3), one red and one black lead with probes. Non-slip feet.

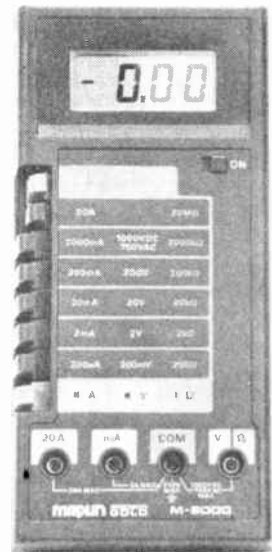
Dimensions: 127 x 74 x 29mm.

Weight: 155g.

Order

YJ77J (Low cost DMM) £26.95

Push Button Digital Multimeter M6000



A digital multimeter with a comprehensive range of features. It has a 0.5in high LCD display which includes a "LO BAT" indicator, and overrange indication by blanking the three least significant digits. Display response time is normally 1 second to rated accuracy. The five different ranges of DC and AC voltage and current, and the resistance range are fully overload protected, using a low capacitance spark gap for overvoltage protection, and a pair of fast switching diodes for the current ranges. In addition, the mA input is protected by a 2A fuse, and the 20A input is rated at up to 20A for 15 seconds. The input of the AC converter is overvoltage protected by a resistor and diode combination, and the resistance input has an inrush current limiter. The test probe potential is switchable from a 'normal' maximum of 3V, which produces best results to a 'low' 0.6V if resistance measurements are required around semiconductor junctions. The 'High' position

is also used to test forward and reverse bias continuity of diodes. The very low power consumption of this meter provides for a battery life of 2000 hours using an alkaline PP3. Input impedance 10M Ω all ranges.

Specifications

DC Volts

Range	Resolution	Accuracy
200mV	100 μ V	$\pm(0.25\%$ of rdg + 1 digit)
2V	1mV	$\pm(0.25\%$ of rdg + 1 digit)
20V	10mV	$\pm(0.25\%$ of rdg + 1 digit)
200V	100mV	$\pm(0.25\%$ of rdg + 1 digit)
1000V	1V	$\pm(0.25\%$ of rdg + 1 digit)

DC Current

Range	Resolution	Accuracy
200 μ A	100nA	$\pm(0.5\%$ of rdg + 1d)
2mA	1 μ A	$\pm(0.5\%$ of rdg + 1d)
20mA	10 μ A	$\pm(0.5\%$ of rdg + 1d)
200mA	100 μ A	$\pm(0.75\%$ of rdg + 1d)
2000mA	1mA	$\pm(1.5\%$ of rdg + 1d)
20A	10mA	$\pm(2\%$ of rdg + 5d)

Max allowable input: 1000V DC

AC Volts @ 45 to 400Hz

Range	Resolution	Accuracy
200mV	100 μ A	$\pm(0.5\%$ of rdg + 2d)
2V	1mV	$\pm(0.5\%$ of rdg + 2d)
20V	10mV	$\pm(0.5\%$ of rdg + 2d)
200V	100mV	$\pm(0.5\%$ of rdg + 2d)

At 45 to 120Hz

750V	1V	$\pm(1\%$ of rdg + 2d)
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AC Current

Range	Resolution	Accuracy
200 μ A	100nA	$\pm(0.75\%$ of rdg + 5d)
2mA	1 μ A	$\pm(0.75\%$ of rdg + 5d)
20mA	10 μ A	$\pm(0.75\%$ of rdg + 5d)
200mA	100 μ A	$\pm(0.75\%$ of rdg + 5d)
2000mA	1mA	$\pm(1.5\%$ of rdg + 5d)
20A	10mA	$\pm(3\%$ of rdg + 5d)

AC response time is three seconds to rated accuracy. Maximum allowable input is 750V AC. The meter has sideways action push button range selector switches so that it can be held and operated in one hand. Supplied with operating instructions, one battery (replacement type PP3), one red and one black test lead with probes and shrouded connectors. Fitted with non slip feet and bench tilt stand.

Dimensions: 180 x 86 x 37mm

Weight: 320gms

Order

YJ78K (Push Button DMM) £39.95

High Precision Digital Multimeter M-5010

A high performance professional quality digital multimeter at an incredibly low price. It has a 0.5 inch high, 3½ digit LCD display with polarity and battery state indicators. The instrument is fully overload protected to UL 1244 on all ranges, and recessed 4mm input sockets prevent accidental contact. The current measuring circuits are protected by a 0.2A/250V fuse in addition to a pair of high speed switching rectifiers. This DMM has 31 ranges, which, in addition to providing for the measurement of DC/AC voltage, DC/AC current and resistance, includes continuity and diode testing facilities. The continuity test sounds an audible buzzer if the resistance measured is below a minimum threshold. The meter has 20 Ω and 20 μ A DC and AC FSD ranges, previously not available on digital multimeters at anything near our price level. In addition the meter circuitry is built onto a gold-plated pcb for long-term reliability and consistent high accuracy.



Ranges

DC Voltage

Range	Resolution	Accuracy
200mV	100 μ V	$\pm(0.25\%$ rdg + 1d)
2V	1mV	"
20V	10mV	"
200V	100mV	"
1000V	1V	"

DC current:

20 μ A	10nA	$\pm(3\%$ rdg + 1d)
200 μ A	100nA	$\pm(0.5\%$ rdg + 1d)
2mA	1 μ A	"
20mA	10 μ A	"
200mA	100 μ A	$\pm(0.75\%$ rdg + 1d)
10A	10mA	$\pm(1.5\%$ rdg + 5d)

AC voltage:

200mV	100 μ V	$\pm(0.5\%$ rdg + 5d)
2V	1mV	"
20V	10mV	"
200V	100mV	"
750V	1V	$\pm(1\%$ rdg + 5d)

AC current:

20 μ A	10nA	$\pm(3\%$ rdg + 5d)
200 μ A	100nA	$\pm(0.75\%$ rdg + 5d)
2mA	1 μ A	"
20mA	10 μ A	"
200mA	100 μ A	"
10A	10mA	$\pm(2\%$ rdg + 5d)

Resistance:

20 Ω	10m Ω	$\pm(3\%$ rdg + 5d)
200 Ω	100m Ω	$\pm(0.5\%$ rdg + 3d)
2k Ω	1 Ω	$\pm(0.3\%$ rdg + 1d)
20k Ω	10 Ω	"
200k Ω	100 Ω	"
2M Ω	1k Ω	$\pm(0.75\%$ rdg + 2d)
20M Ω	10k Ω	$\pm(1.5\%$ rdg + 1d)

The continuity tester has a 200 Ω resistance range. The diode test facility has a 2.8V test voltage and a maximum test current of 3mA. All DC and AC ranges have an input impedance of 10M Ω ; in the case of the AC ranges this is shunted by 100pF. The AC ranges have an input frequency range in the order of 45Hz to 500Hz, and a response time of 1 sec. DC voltage ranges have a response time of <1 sec. Overrange indication takes the form of the 3 least significant digits being blanked out, showing that a higher range should be selected.

Overload protection

DC voltage:	1,000V DC or peak, all ranges
DC current:	200mA fuse, all mA ranges 15A for 15 sec. 10A range
AC voltage:	300V for 15 sec. max, 200mV range 1000V DC or 750V AC rms continuous, all other ranges
AC current:	200mA fuse, all mA ranges 15A for 15 sec. 10A range
Resistance:	500V DC or AC rms input max

The M-5010 uses a single PP3 size 9V battery, supplied. The meter comes complete with one red and one black test lead with safety probes and fully shrouded plugs, and comprehensive operating instructions.

Dimensions 170 x 87 x 42mm. We ght 343g.

Order

YJ10L (Multimeter M-5010) £41.95

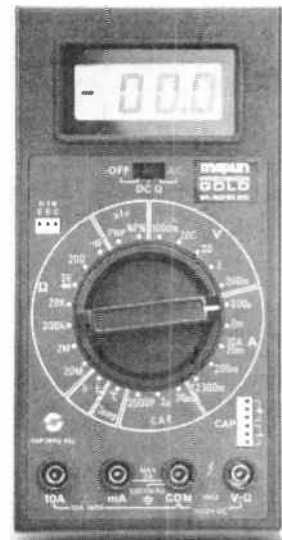
Multi-Purpose Digital Multimeter M5010EC

NEW

This versatile digital multimeter packs a whole range of useful test instruments into one small size, easy-to-use package. You do not have to put up with having your working area cluttered up with several different testers and instruments if you use the M5010EC. In addition to the usual high resolution digital display of DC and AC voltages and currents, and resistances, on a 3½ digit 0.5in. high LCD readout, there is also a continuity buzzer, a facility for measuring conductance in mhos, greatly extending the resistance ranges and very useful for very low current leakage testing. The ohm's ranges include a diode testing facility, and especially useful is the PNP and NPN transistor tester which will read out h_{FE} from 0 to 1000.

The meter can also easily become a digital thermometer simply by plugging in the thermocouple probe with lead (supplied). And it is a capacitance tester too! Full overload protection is provided to UL244, featuring a spark gap for DC and AC voltage ranges operating at 1000V DC or 750V AC rms, in-rush current limiting on all resistance ranges rated up to 500V and fast switching high power diodes plus 2A fuse protects all current ranges, except 10A range rated at 15A for 15 seconds.

The input of the A/D converter is over voltage protected. All inputs are 10M Ω impedance. Battery life is 200 hours using alkaline PP3. Display includes 'LO BAT' indicator, and shows overrange by blanking the three least significant digits.



DC Voltage

Range	Resolution	Accuracy
200mV	100 μ V	$\pm(0.25\%$ of rdg + 1 digit)
2V	1mV	$\pm(0.25\%$ of rdg + 1 digit)
20V	10mV	$\pm(0.25\%$ of rdg + 1 digit)
200V	100mV	$\pm(0.25\%$ of rdg + 1 digit)
1000V	1V	$\pm(0.25\%$ of rdg + 1 digit)

DC Current

Range	Resolution	Accuracy
200 μ A	100nA	$\pm(0.5\%$ rdg + 1d)
2mA	1 μ A	$\pm(0.5\%$ rdg + 1d)
20mA	10 μ A	$\pm(0.5\%$ rdg + 1d)
200mA	100 μ A	$\pm(0.5\%$ rdg + 1d)
2000mA	1mA	$\pm(0.5\%$ rdg + 1d)
10A	10mA	$\pm(0.5\%$ rdg + 1d)

AC Voltage

Range	Resolution	Accuracy
200mV	100µV	±(0.5% rdg + 5d)
2V	1mV	±(0.5% rdg + 5d)
20V	10mV	±(0.5% rdg + 5d)
200V	100mV	±(0.5% rdg + 5d)
750V	1V	±(1% rdg + 5d)

AC Current

Range	Resolution	Accuracy
200µA	100nA	±(0.75% rdg + 5d)
2mA	1µA	±(0.75% rdg + 5d)
20mA	10µA	±(0.75% rdg + 5d)
200mA	100µA	±(0.75% rdg + 5d)
2000mA	1mA	±(1.5% rdg + 5d)
10A	10mA	±(2% rdg + 5d)

Resistance

Range	Resolution	Accuracy
200Ω	100mΩ	±(0.5% rdg + 3d)
2kΩ	1Ω	±(0.3% rdg + 1d)
Max open circuit voltage = 2.8V		
20kΩ	10Ω	±(0.3% rdg + 1d)
200kΩ	100Ω	±(0.3% rdg + 1d)
2MΩ	1kΩ	±(0.75% rdg + 2d)
20MΩ	10kΩ	±(1.5% rdg + 2d)
Max open circuit voltage = 500mV		

Continuity Test

Buzzer sounds at less than approximately 200Ω.
Response time = 100ms

Diode Test

Range selector on 2kΩ
Test voltage 2.8V
Maximum test current 3mA

Temperature Measurement

Range	Resolution	Accuracy
-20°C to 1370°C	1°C	±(0.25% rdg + 1d)

Sensor: type K (NiCr - NiAl)

Conductance Measurement

Range	Resolution	Accuracy
200ns	0.1ns	±(1.5% rdg + 10d)

(Equivalent to 5MΩ to 10,000MΩ).

Capacitance Measurement

Range	Resolution	Accuracy
2000pF	1pF	±(1.5% rdg + 5d)
2µF	0.001µF	±(2% rdg + 5d)
20µF	0.01µF	±(2% rdg + 5d)

h_{FE} Test

Test condition: 10µA 2.8V
h_{FE} Gain 0 - 1000 (NPN/PNP)

A 3-way inline socket is provided for plugging in the transistor to be tested. The capacitance tester uses a 6-way inline socket where 3-ways are commoned for capacitor '+', and the other 3 are commoned for capacitor '-', and will therefore match a variety of different capacitors with different spacing between lead-out wires. The measuring circuit can be adjusted for zero null with a front panel preset slotted for screwdriver adjustment for really accurate measurements, by using a high tolerance capacitor as a reference. All ranges are accessible via one single 360° action rotary switch. Separate on/off switch also selects DC/Ω or AC.

The meter includes a bench tilt stand which can be unhooked and moved to a pair of lugs at the top of the case to form a loop/handle for hanging up the meter if required. Supplied with operating instruction, battery (replacement type PP3), one black and one red test leads with probes and shrouded plugs. Case has non slip feet.

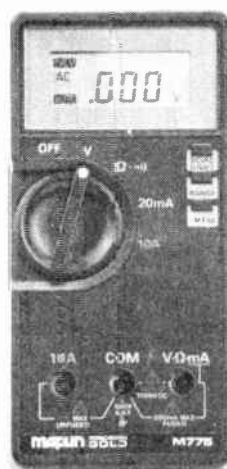
Dimensions: 170 x 87 x 42mm
Weight: 343gms

Order

YJ79L (Multi-purpose DMM) £59.95

Auto Ranging Digital Multimeter M775

NEW



A digit multimeter with auto ranging capability for DC and AC voltage and resistance ranges, very useful if widely differing values need to be repeatedly measured since the range selector switch does not need to be continually turned to the required range. The range selector has only 5 positions for ON/OFF, DC/AC volts, ohms and continuity buzzer, and two current ranges. The 3½ digit 0.5in high LCD display includes overrange indication by flashing the most significant digit ("1") and blanking the others, and 'LO BAT' and 'AUTO' indicators in addition to the polarity ("-") indicator. There are only three push buttons in addition to the selector switch, which provide the functions for choosing DC, AC, low Ω or high Ω ranges: Range hold - autoranging returns if the selector is rotated to another position - and '-MEM', which if pressed, activates the MEM mode, which will make following measurements relative to the value of the last two digits (≤99) displayed at the time the button was pressed, and this value is subtracted from further measurements so that lead resistance for example can be effectively removed. This mode is deactivated by selecting another range.

Specifications

DC voltage

Range	Resolution	Accuracy
200mV	100µV	±(0.5% rdg + 1 digit)
2V	1mV	±(0.5% rdg + 1 digit)
20V	10mV	±(0.5% rdg + 1 digit)
200V	100mV	±(0.5% rdg + 1 digit)
1000V	1V	±(0.5% rdg + 1 digit)

AC Voltage

Range	Resolution	Accuracy
2V	1mV	±(0.75% of rdg + 5d)
20V	10mV	±(0.75% of rdg + 5d)
200V	100mV	±(0.75% of rdg + 5d)
750V	1V	±(0.75% of rdg + 5d)

DC Current

Range	Resolution	Accuracy
20mA	10µA	±(0.75% rdg + 1 digit)
20A	20mA	±(0.75% rdg + 1 digit)

AC Current at 40 to 500Hz

Range	Resolution	Accuracy
20mA	10µA	±(1% rdg + 5d)
20A	20mA	±(2% rdg + 5d)

Resistance

Range	Resolution		Accuracy
	LowΩ	HighΩ	
2kΩ	1Ω	0.1Ω	±(0.75% rdg + 2d)
20kΩ	1Ω	0.1Ω	±(0.75% rdg + 2d)
200kΩ	1Ω	0.1Ω	±(0.75% rdg + 2d)
2MΩ	1Ω	0.1Ω	±(0.75% rdg + 2d)

Max open circuit voltage
0.5V 1V

Max current flow
138µA 1.6mA

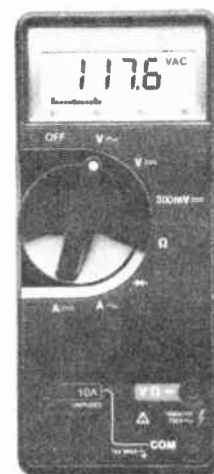
The lowΩ mode allows higher resolution and presents to the probes a sufficiently low open circuit voltage to permit in-circuit testing without turning on semiconductor junctions. The M775 can also be used for continuity testing and a buzzer automatically sounds for approximately 2 seconds whenever an ohms measurement is taken when the resistance is 200Ω or less. All inputs are fully overload protected, DC ranges to 1100V and AC ranges to 800V rms, resistance ranges to 250V, and 0.2A fuse protecting the 20mA range. The 10A range will withstand 12A max for 60 seconds. Input impedance for all ranges is 10MΩ, except 200mV DC range at 100MΩ.

Supplied with operating instructions, one black and one red test lead with probes and shrouded plugs, and one battery (replacement type PP3).
Dimensions: 150 x 75 x 34mm
Weight: 230gms
Case fitted with non-slip feet.

Order

YJ80B (Auto-ranging DMM) £39.95

Analogue and Digital Autoranging Multimeters Fluke 73



This incredible multimeter from Fluke — one of the world's most respected names in laboratory precision instruments — at last brings superb quality to the hobbyist and professional engineer at an affordable price. Yet even at this amazingly low price this precision digital multimeter (DMM) incorporates a state-of-the-art analogue bar graph which permits instant observation of trends, and makes peaking and nulling particularly easy and finally removes any last advantage an analogue meter could have. The meter features a large digital display that is easily read from any angle, with accuracy and resolution far greater than even the best analogue meters. The meter offers autoranging, autopolarity, auto-zero, superior overload protection and a ruggedness that makes it virtually indestructible. The meter carries a full 3-year guarantee. So if you're looking for a meter for a lifetime, there's no longer any choice.

Easy to use

Simply select the function on the 8-position rotary switch and test. Autoranging software instantly selects the proper range for maximum resolution and shows whether it is positive or negative. On most ranges, the function selected is shown on the display e.g. VAC, VDC, Ω, kΩ, MΩ etc. The meter even correctly places the decimal point and has a 3200 count resolution unlike most meters which read up to 1999 only, so that you could for example read the mains voltage to one decimal place. Where previously you would have seen only (e.g.) 250V you will now see (e.g.) 250.3V — in fact all the way down the line the meter offers incredible accuracy.

Accuracy, Ruggedness, Dependability

The meter has a basic accuracy of 0.7% — better than that of the finest analogue-only meters. The ruggedly designed case can withstand repeated falls without damage and when fitted in the (optional extra) holster it will suffer no damage even if dropped from the top of a telegraph pole! The meter is so well protected against overloads that you can connect up to 500V to the meter and switch to any range without damage. Each time you turn the meter on, you activate a 2-second diagnostic self-test of critical functions and the battery, and all segments of the display come on to show that everything is working. Average battery life is at least 2 years, but should you accidentally leave the meter switched on, a "sleep mode" automatically powers the meter down after about 1 hour.

More Features

In addition to the basic AC and DC Volts and Amps and Resistance ranges the meter also has a low voltage range for finer accuracy on voltages under 300mV and a diode test that displays the forward voltage drop up to 2V to give quick checks of semiconductor junctions. The very low power ohms ranges mean that you can make in-circuit resistance measurements in many cases. The digital display is updated 2½ times every second whilst the analogue display is updated 25 times per second and has its own separate polarity indicators. The meter will indicate overload and low battery conditions and also indicates when it is in "sleep mode".

Specification

Volts DC

Ranges 320mV, 3.2V, 32V, 320V, 1000V

Sensitivity 320mV range 0.1mV

Accuracy
320mV-320V ranges 0.7% + 1 digit
1000V range 0.8% + 1 digit

Input resistance 10MΩ

Overload protection 1000V

320mV range only 500V

NMRR (50Hz, 60Hz) >60dB

CMRR (50Hz, 60Hz) >120dB

Volts AC

Ranges 3.2V, 32V, 320V, 750V

Sensitivity (3.2V range) 1mV

Accuracy
32V-750V ranges 3.0% + 2 digits
(45Hz-1kHz)
3.2V range only 3.0% + 2 digits
(45Hz-500Hz)

Frequency response (typ) 32V, 320V ranges
-0.5dB at 10kHz
3.2V, 750V ranges:
±3dB at 5kHz

Input impedance 10MΩ <50pF

Overload protection 750V AC, 1000V DC

Ohms

Ranges 320Ω, 3200Ω, 32kΩ,
320kΩ, 3.2MΩ, 32MΩ

Sensitivity (320Ω range) 0.1Ω

Accuracy
320Ω range 1.0% + 2 digits
3200Ω-3.2MΩ ranges 1.0% + 1 digit
32MΩ range 3.0% + 1 digit

Open circuit voltage <3V

Full scale voltage <440mV
(<1.4V on 32MΩ range)

Overload protection 500V rms

Diode test

Range 0-2V
Accuracy (typical) 1% + 1 digit
Overload protection 500V rms

Amps AC/DC

Maximum reading 10A
Maximum sensitivity 10mA

Accuracy

AC 10A range 3.0% + 2 digits
(45Hz-1kHz)
DC 10A range 2.0% + 2 digits
Voltage burden 0.5V

General

Power supply 9V PP3 battery
Battery life >2000 hours (alkaline)/
1600 hours (zinc-carbon)

Measurement rate 25 measurements per
second, analogue display
2.3 measurements per
second, digital display

Common mode voltage 1000V DC or peak
AC maximum

Temperature range Operating 0°C to 50°C
Storage -40°C to +60°C

Dimensions 28.4 x 74.9 x 166.4mm
Weight 0.28kg

Supplied with battery, a pair of test leads and instruction manual.

Order

YK78K (Fluke 73 Multimeter) £82.80

Fluke 75

The Fluke 75 has all of the functions of the 73 above, but in addition, possesses a 'Range Hold' mode. Range Hold allows selection of a fixed measurement range. This is most useful where readings need to be taken and shown on the same scale for comparison. The ranges are chosen by repeatedly pressing the lozenge-shaped button in the centre of the selector switch. To disable Range Hold and return to autoranging, the button is held down for 1 second whereupon the meter will bleep and return to normal. Meter will display OL (Over-Load) if the range is too low indicating that the button must be pushed for a higher range. Supplied in box with full instructions, PP3 battery and shrouded test leads with probes. All other specifications as Fluke 73.

Order

YJ88V (Fluke 75 Multimeter) £101.20



Fluke 77

The Fluke 77 is identical in specification to the Fluke 73 and includes the Range Hold facility of the Fluke 75. In addition, it has the ability to store and hold any reading every time the probes are connected to the circuit under test. This 'Touch Hold' function is extremely useful where a measurement must be made while the operator is unable to see the meter reading without difficulty, or cannot see the meter at all when placing the probes. The Touch Hold function is activated by holding down the Range Hold button, identical to that on the 75, whilst switching on. When the range group required is selected the meter is allowed to settle first before the button is released —

from then on, the 77 will store and display each reading, updating next time the probes are touched onto the test points for ½ second, or, if attached to the circuit under test for monitoring purposes, then pressing the button will force a new reading to be taken. Updating of readings will only occur if the new value is different from the previous one by at least one segment of the analogue display, or if the button is pressed. This function only operates in the autorange mode and cannot be used simultaneously with Range Hold. Touch Hold is deactivated by turning the meter off. The 77 will behave as the 75 version if switched on without the Range Hold button being held down. All other specifications as Fluke 73 above.

Supplied boxed with full instructions, PP3 battery, and test leads with probes and shrouded plugs.

Order

YJ89W (Fluke 77 Multimeter) £126.50

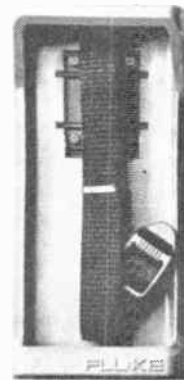
Replacement Leads for Fluke Meters

Standard replacement safety test leads with right angle shrouded plugs and probes.

Order

FA07H (Replace Test Leads) £7.95

Holster



A shock-absorbing holster for rough handling. The holster has a tilt stand, holds or stores test leads, has a belt hook for hands-free carrying and a neck strap for easy viewing.

Order

YK81C (Fluke Meter Holster) £12.95

Soft Carrying Case



A soft vinyl case with removeable belt loop. Holds the meter and test leads ready for testing.

Order

YK79L (Fluke Meter Case) £11.95

BENCH MULTIMETER

A precision digital multimeter with a 3½ digit ½in. LCD display. The meter has a basic accuracy of 0.1% ± 1 digit and 25 ranges. The display indicates polarity of measurement and also shows when the battery has less than 400 hours life left. All inputs are protected against overloads and transients and the last three digits are blanked to indicate that the input is over range. Battery life is approximately 2000 hours. The case has a carrying handle/tilt leg. A hold facility is available which holds indefinitely the reading being displayed when the button was pressed.



Overall size:	210 x 225 x 60mm
Input impedance:	10MΩ DC, 10MΩ in parallel with 100pF AC
Accuracy:	DC Volts: 0.1% ± 1 digit AC Volts: 0.75% ± 1 digit DC Current: 0.25% ± 1 digit AC Current: 1% ± 1 digit Resistance: 0.2% ± 1 digit
Ranges	0.1mV to 200mV
DC Volts:	1mV to 2V 10mV to 20V 100mV to 200V 1V to 1000V Protection ± 1000V DC and 6kV transient
AC Volts:	0.1mV to 200mV 1mV to 2V 10mV to 20V 100mV to 200V 1V to 1000V Protection 1000V and 6kV transient
DC & AC Current:	0.1μA to 200μA 1μ to 2mA 10μA to 20mA 100μA to 200mA 1mA to 2A Protection 2A or 250V
Resistance:	0.1Ω to 200Ω 1Ω to 2kΩ 10Ω to 20kΩ 100Ω to 200kΩ 10kΩ to 20MΩ Protection 300V

Supplied complete with operating instructions and battery (replacement type PP7). Test leads are not supplied; suitable type is HF33L.

Order

LH95D (Precision Multimeter) £109.95

CLAMP METER

A clamp meter designed primarily for measuring AC current without breaking the circuit. The sheathed current carrying conductor is placed inside the clamp and currents between 200mA AC and 300A AC are measured without making any direct connection to the conductor. The clamp opens and closes to allow conductors up to 28mm diameter to be inserted. In addition the meter will read AC voltages from 5V to 600V and resistance up to 1kΩ using the test leads supplied. The instrument incorporates a meter lock for transportation and also for use when the meter is used in places where the meter is difficult to read whilst the measurement is being taken. The meter



may be simply locked and the reading made afterwards. The meter is designed to be comfortable to hold in the hand and a safety wrist-strap is provided. The meter comes complete with a carrying case with loop for fixing to belt.

Overall size:	195 x 85 x 46mm (meter) 215 x 125 x 55mm (carry case)
Weight:	370gms (575gms including carrying case)
3-colour scale	
Sensitivity:	2000 ohms per volt
Accuracy:	±3% of full scale deflection
Ranges:	
AC Current:	6A, 15A, 60A, 150A, 300A
AC Voltage:	150V, 300V, 600V at 2000 ohms per volt
Resistance:	0 to 1kΩ (30Ω at centre of scale) (Minimum reading: 1Ω)

Supplied complete with detailed operating instructions, one red and one black test lead with probes, one battery (replacement type HP7), three 100mA 1¼in quickblow fuses (one fitted and two spares) and a carrying case.

Order

LH80B (Clamp Meter) £39.95

CARRYING CASE



A sturdy carrying case in black 'leather look' PVC which may be used to hold multimeters and other similar sized test gear. There may also be room left over for test leads and small screwdrivers, etc. Fitted with flap press-stud and a carrying strap. Internal dimensions: 130 x 155 x 55mm. Strap is 370mm end to end.

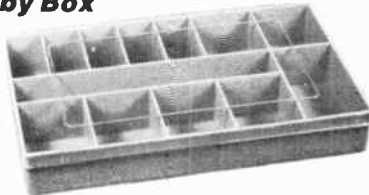
Order

BK78K (Carrying Case) £3.95

TOOLS

Adhesives	430	Knives	421	Solder	428
Antistatic Materials	420	Pliers	418	Soldering Irons	424
Cutters	417	Screwdrivers	416	Spanners	420
Drills	422	Service Aids	428	Wire Strippers	419

COMPONENT STORAGE Hobby Box

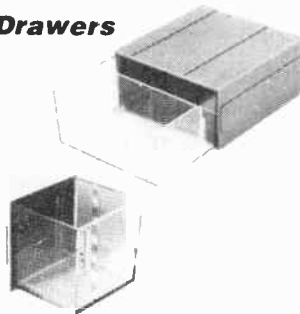


A grey plastic tray 256 x 155 x 39mm high, divided into 13 compartments. Five measure 58 x 29mm, six measure 58 x 49mm, one measures 90 x 49mm and one measures 201 x 30mm. Box comes complete with a transparent plastic lid.

Order

LH15R (Hobby Box) £2.80

Storage Drawers



Interlocking plastic slide drawers. A grey plastic outer into which slides a clear plastic drawer which may be divided centrally with divider (supplied). Drawers have a 15mm long lip handle and a location for a card indicating contents. Grey outer has grooves on four sides (not rear) so that it can quickly be joined with other drawers to make a secure set of drawers in which components etc. may be stored.

Internal size: 115 x 51 x 50mm high single
115 x 102 x 50mm high double
External size: 125 x 61 x 60mm high single
125 x 122 x 60mm high double

Order

FR22Y (Storage Drawer) 98p
FG00A (Dbl Storage Drawer) £1.48

TRIMMING TOOLS Hexagon Type



Tool moulded in blue acetel for adjusting 6mm cores with 0.1in. af hexagon centre hole. Hexagon at each end with screwdriver extension at one end only. Length: 127mm.

Order

BR48C (Hex Trimmer) 24p

Pot Core Type



Moulded tool, with a phosphor bronze blade at each end. Designed to fit 4mm and 6mm cores. Suitable for use with our pot cores. Length: 46mm.

Order

BR51F (Trim Tool) 48p

Preset Type

A trim tool for preset potentiometers. Double-ended with protruding blade for single turn presets etc., and recessed blade for our 15-turn cermet etc. Recess prevents blade slipping out during adjustment. Length: 130mm.

Order

BR49D (Preset Trimmer) 74p

IFT Type

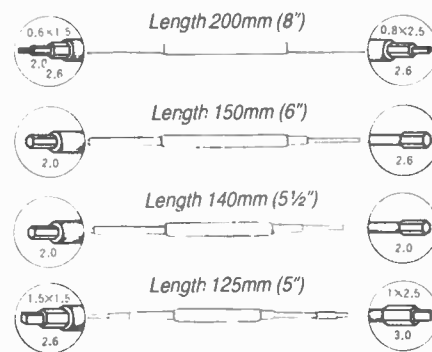


A trim tool suitable for adjusting IFT's. Trans Coils and Iron Dust Cores. 2mm wide copper blade fixed to long plastic handle (150mm long including blade). Blade length 12mm approx.

Order

BR50E (Trim TT5) 68p

Alignment Tool Set



A set of moulded plastic tools for alignment of colour TV, Hi-Fi, Radio Amateur, CB and AM and FM radio. This set should enable you to align any combination of cores that require flat-bladed, hex, or square trimming tools.

Order

BK34M (Trim Tool Set) £1.40

TOOL SETS Miniature Screwdriver Set



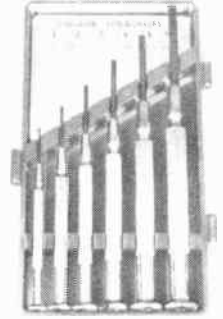
Five precision miniature screwdrivers in a plastic wallet. Screwdrivers are chromed with swivel cap. Blade widths (overall length of screwdriver in brackets): 0.8mm (73mm); 1mm (76mm); 1.4mm (79mm); 1.8mm (83mm); 2mm (86mm).

Order

FY07H (Min Screwdriver Set) 98p

Precision Screwdriver Set

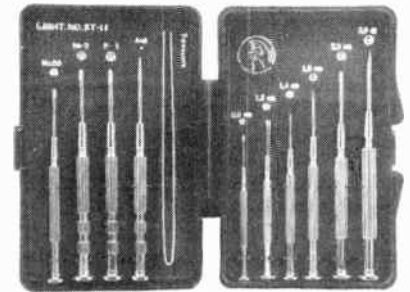
Six precision instrument screwdrivers in a hinged plastic box with transparent cover. Each consists of a specially hardened, nickel chrome molybdenum steel blade set into a heavily chromed, knurled brass holder with swivel cap. Blade widths (overall length of screwdriver in brackets): 0.8mm (74mm); 1.4mm (83mm); 2mm (92mm); 2.4mm (103mm); 2.9mm (114mm); 3.8mm (128mm).



Order

BR58N (Jewellers Screwdr Set) £2.95

11-Piece Precision Screwdriver Set



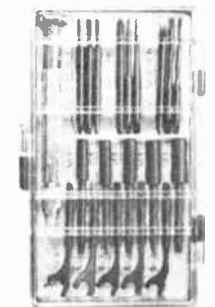
Eleven high quality precision screwdrivers with fully hardened tool steel blades, plated brass bodies and freely revolving heads. Set comes in a hinged plastic box, and consists of six plain slot screwdrivers 0.9, 1.2, 1.4, 1.8, 2.3, and 3mm, three crosspoint screwdrivers blade sizes 00, 0, and 1, an awl and a pair of tweezers.

Order

BK44X (11 Pce S/Driver Set) £8.95

Interchangeable Utility Set

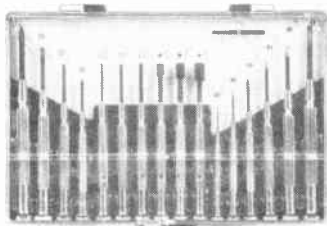
A very useful set of small tools all of which fit into screwdriver-type body. 19 different tools: Box spanners 3mm, 3.5mm, 4mm, 4.5mm, 5mm; Open-ended spanners 4mm, 4.5mm, 5mm, 5.5mm, 6mm; Allen keys 1.5mm, 2mm, 2.5mm; Pozidrive screwdriver size 0 and size 1; Flat blade screwdrivers (blade widths) 1.5mm, 2mm, 2.5mm, 3.5mm; and an Awl. These miniature precision tools (all approx 50mm long; handle 92mm long) are supplied in a hinged plastic case.



Order

FY08J (Utility Set) £5.95

Universal Driver Set

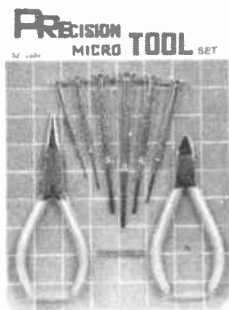


A comprehensive 17 piece tool set in a plastic storage case with hinged, perspex lid. The driver set comprises a range of five flat blade screwdrivers in 0.8mm, 1.4mm, 2.0mm, 2.4mm and 2.9mm sizes, plus a range of four cross-head drivers in 2.0mm diameter and 2.5mm diameter versions of size 0, and 3.0mm and 4.0mm diameter versions of size 1. In addition there are three allen keys of 1.5, 2.0 and 2.5mm, and three metric nut spinners of 3.0, 4.0 and 5.0mm. There is also a 35mm long steel tommy bar for use with the allen keys and nut spinners. The case measures 210mm x 148mm x 22mm. Weight 455gm.

Order

YJ26D (Universal Driver Set) £5.95

Precision Micro Tool Set



A card containing a selection of useful miniature tools, comprising a small pair of long-nose pliers 125mm long, a small pair of diagonal side cutters 115mm long, and six miniature screwdrivers consisting of four flat blade style drivers in 0.9mm, 1.2mm, 1.8mm and 3.0mm sizes, and two cross-head style drivers in 2.5mm (No.0) and 3.0mm (No.1) sizes.

Order

FK52G (Micro Tool Set) £10.95

Screwdriver Set



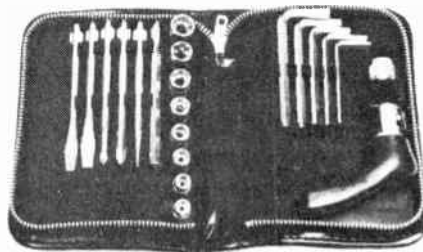
A set of six screwdrivers with cushiongrip handles. Set comprises: one Crosspoint size 2, length 102mm; and five flat blade screwdrivers: one stubby, blade width 6mm, length 38mm; one with blade width 3mm, length 64mm; one with blade width 5mm, length 102mm; one with blade width 6mm, length 102mm; and one with blade width 8mm, length 153mm.

Order

WY04E (Cushiongrip Drvr Set) £6.95

Ratchet Socket and Screwdriver Set

A ratchet handle into which fits an extension bar and eight sockets sizes 5mm, 5.5mm, 6mm, 7mm, 8mm, 9mm, 10mm and 11mm. Four screwdriver blades and a spike also fit into the handle. Screwdrivers comprise two flat blade sizes 5mm and 6mm and two crosspoint/pozidrive sizes 0 and 1. The kit also contains five allen keys sizes 3.175mm (1/16in), 4mm (5/32in), 4.75mm (3/16in), 5.5mm (7/32in) and 6.35mm (1/4in). The tools are supplied in a simulated black leather zip-up case size 165 x 115mm.

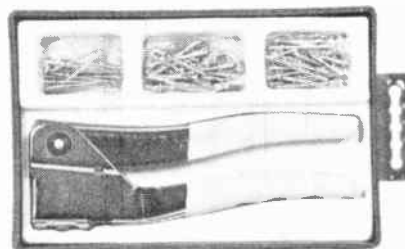


Order

YW92A (Ratchet Socket Set) £5.95

Hand Riveter Set

A hand-riveting tool with pressed steel chrome-plated body and vinyl grip. Supplied with three packs of rivets, 2.4mm (3/32in), 3.2mm (1/8in) and 4.0mm (5/32in) sizes. Additional rivets are also available in packs of 50 in these three sizes.



Order

FK53H (Hand Riveter Set) £9.95
FM94C (Rivet 3/32in Pk 50) 88p
FM95D (Rivet 1/8in Pk 50) 98p
FM96E (Rivet 5/32in Pk 50) £1.08

SCREWDRIVERS Miniature Screwdriver



A small, inexpensive screwdriver with coloured plastic handle and 38mm long blade.

Order

YX74R (Min Screwdriver) 12p

Light Duty Screwdrivers



A range of small screwdrivers primarily intended for light duty work and small screws. Blades are made of tempered and hardened tool steel and nickel plated, in 75mm, 100mm and 150mm lengths respectively. Moulded plastic handles.

Order

BR52G (L Duty Driver 75mm) 38p
BR53H (L/Duty Driver 100mm) 42p
FV46A (L/Duty Driver 150mm) 48p

General Purpose Screwdrivers



Medium size screwdrivers for general purpose applications. Can be used for most sizes of slotted-head screws commonly used in electronic equipment construction. Tempered nickel plated steel blades are 75mm and 150mm in length respectively. Moulded plastic handles.

Order

FY10L (Gen/Purp Driver 75mm) 72p
FY12N (Gen/Purp Drivr 150mm) 95p

Heavy Duty Screwdriver



A large screwdriver with a strong, square section chrome vanadium blade for large slotted head screws. The moulded handle has a flattened section to aid grip. The chrome plated blade is 100mm long and is magnetic to help prevent screws being lost during awkward tasks. Handle is flame proof and shock proof.

Order

FV47B (Robust Screwdriver) £1.60

Chubby Screwdriver

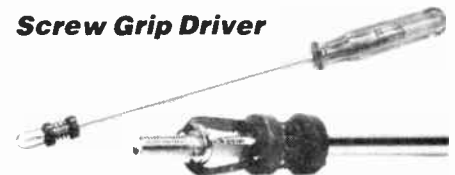


The screwdriver to use where the use of a conventionally shaped screwdriver is impossible. Chunky 30mm diameter handle ensures adequate grip. For slotted-head screws. Tempered tool steel blade is 36mm long.

Order

FV48C (Chubby Screwdriver) 98p

Screw Grip Driver



A long bladed screwdriver with sprung jaws for gripping the head of the screw whilst reaching into difficult places. The clamp can be slid back up to the handle if not required. Overall length 230mm. Blade length 154mm. Width at tip 4mm.

Order

BK35Q (Screw Grip Driver) £1.20

Flexible Screwdriver

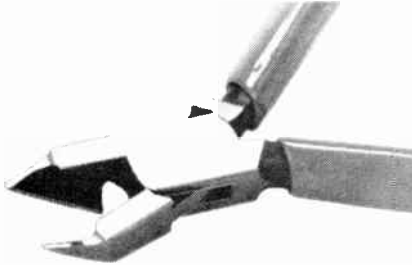


A flexible shaft screwdriver for use where a direct straight approach to the screw is impossible. The flexible shaft can be bent through >90°. Overall length 230mm. Length of shaft and blade 135mm. Width of blade tip 4mm.

Order

BK36P (Flex Driver) £2.95

Standard Slanted Box Joint



Superior quality slanted cutters with hardened edges for long life. Insulated handles. Overall length 125mm.

Order
FY22Y (Std Slant Edge Cuttr) £10.95

TWEEZERS Nylon



A pair of nylon tweezers with serrated tips. Overall length 128mm. Max jaw opening 25mm.

Order
YW67X (Nylon Tweezers) 38p

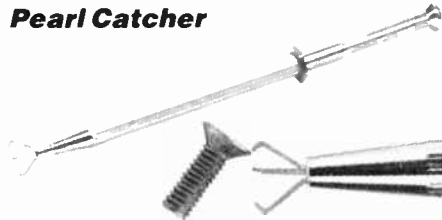
Stainless Steel



A pair of stainless steel tweezers with serrated jaws and finger grips. Overall length 127mm. Max jaw opening 16mm.

Order
FA65V (Steel Tweezers) 48p

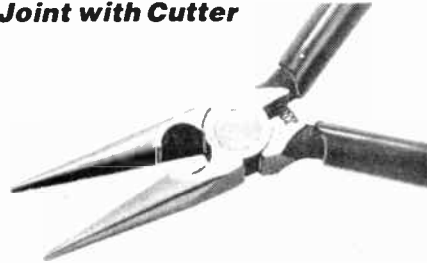
Pearl Catcher



A spring-loaded 3-pronged tweezer for reaching into those difficult places to retrieve the smallest screw.

Order
BK43W (Pearl Catcher) £2.20

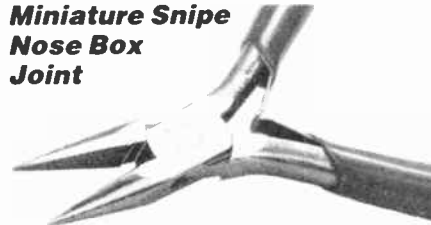
PLIERS Miniature Low-cost Lap Joint with Cutter



Long nose pliers with wire cutter. Tips of jaws are only 2.0 x 1.5mm when closed. Insulated handles. Overall length 125mm.

Order
FV55K (Min Lap Jt Pliers) £5.95

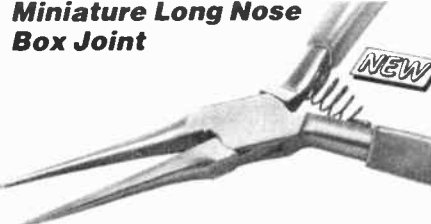
Miniature Snipe Nose Box Joint



Box jointed snipe nose pliers with smooth jaws and insulated sprung handles. Overall length 120mm.

Order
BR78K (Min Snipe Pliers) £7.50

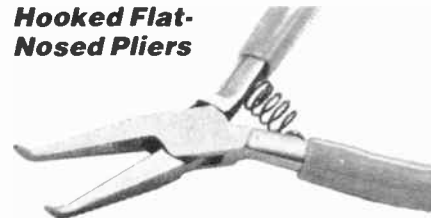
Miniature Long Nose Box Joint



Box jointed miniature long nose pliers with insulated sprung handles. Overall length 115mm.

Order
FV54J (Min Long Nose Pliers) £9.95

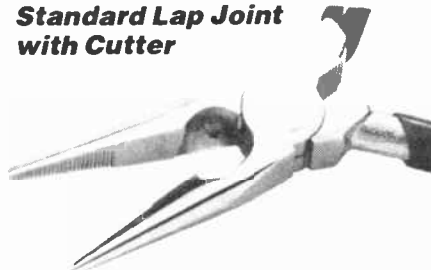
Hooked Flat-Nosed Pliers



Miniature, high quality box-jointed hooked flat nosed pliers. Insulated handles with spring. Size 115mm.

Order
BK41U (Min Hook Nose Pliers) £9.95

Standard Lap Joint with Cutter



Snipe nose pliers with integral wire cutter. Chrome plated finish with insulated handles. Tips of jaws are 2.0mm x 3.0mm. Overall length 125mm.

Order
BR77J (Std Lap Jt Plier) £5.95

Standard Lap Joint with Stripper



Long nose chrome plated pliers with serrated jaws and integral wire stripper blades for use with 1.5mm dia core insulated wire. Insulated handles. Overall length 150mm.

Order
FY26D (Std Stripper Plier) £5.50

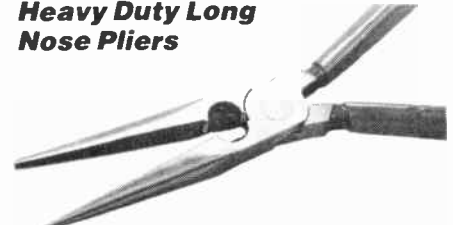
Extra Long Nose Box Jointed



Extra long nose box jointed pliers with serrated jaws and insulated handles. Overall length 170mm.

Order
BR73Q (Xtra Long Nose Plier) £8.95

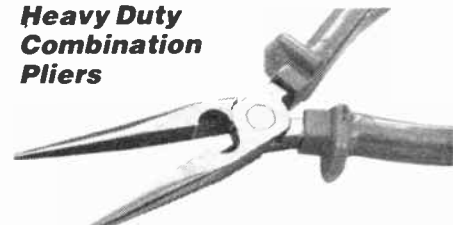
Heavy Duty Long Nose Pliers



A pair of low-cost lap-jointed long nose pliers with serrated jaws, cutter, and insulated handles. Size: 200mm.

Order
FY27E (Heavy Duty Pliers) £4.95

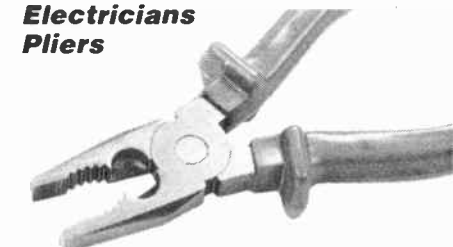
Heavy Duty Combination Pliers



A pair of lap-jointed snipe nose pliers with serrated jaws, cutter and burner hole and heavy plastic insulated handles with anti-slip guards. Size 200mm.

Order
BR92A (H/Duty Combntn Plier) £4.95

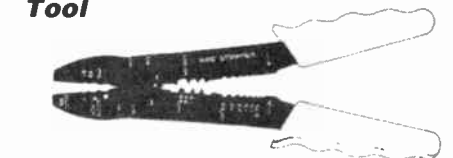
Electricians Pliers



A high quality pair of lap-jointed electricians pliers with bevelled cutter and burner hole and heavy plastic insulated handles with anti-slip guards. Size: 160mm.

Order
BR91Y (Electricians Pliers) £4.95

Crimping, Stripping & Cutting Tool



A useful low-cost combination tool with plastic handles with anti-slip guards. Tool has bolt cutters for M2.5, M3, M3.5, M4 and M5 bolts, strippers for cables/wires of conductor area, 0.75, 1.5, 2.5, 4 and

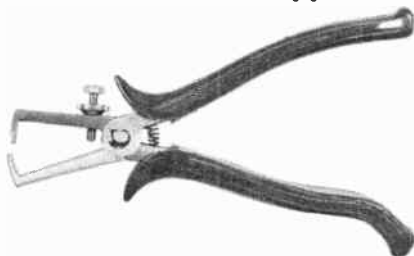
5mm² and a crimping tool for red, blue and yellow industrial-type insulated crimp connectors. Please note that we found the 1.5mm² hole ideal for stripping 1mm² T & E wires, the 2.5mm² hole ideal for stripping 1.5mm² T & E, the 4mm² hole ideal for stripping 2.5mm² T & E, and the 10mm² hole ideal for stripping 6mm² T & E.

Order

FY31J (Crimp Tool) £1.95

WIRE STRIPPERS

End-Action Wire Strippers



For removing insulation from cable ends without damaging the conductor. The hardened steel jaws are adjustable to accept conductors up to 0.156in (3.9mm, 8swg) overall diameter. By turning the knurled wheel between the jaws, the conductor can be severed without altering the stripper setting. An opening spring facilitates action and reduces operator fatigue. With PVC insulated handles. Size: 165mm (6½in).

Order

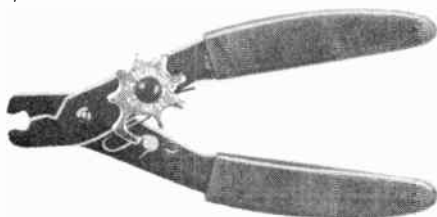
BR76H (End Action Strippers) £7.95

Side-Action Wire Strippers

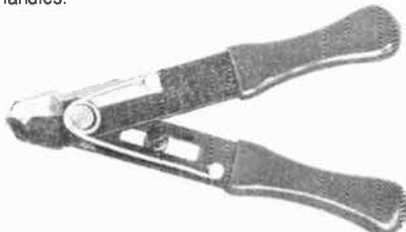
A range of three wire strippers all of which strip insulation quickly and easily from flex and cable without cutting the wire and are easily adjustable to most wire sizes. They also have cutting blades for cutting wire easily and splitting plastic twin flex.



Model 3A: Easy to use with 4-gauge selector. 4/6BA spanners in handles.



Model 8B: Fitted with a unique 8-gauge selector and handle locking device. Spring incorporated for automatic opening. Easy-grip plastic covered handles.



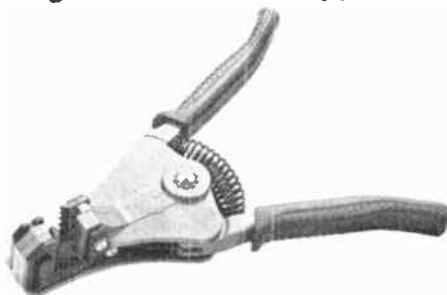
Model 9: Easily adjusts for most sizes of flex and

cable. Fitted with extra strong spring for automatic opening after each stripping operation. Ideal for repetitive work. Easy-grip plastic handles. Also fitted with simple handle locking device.

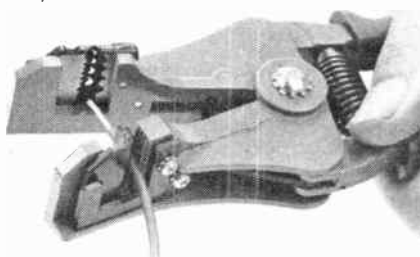
Order

BR93B (Wire Strippers 3A) £2.35
 BR94C (Wire Strippers 8B) £1.20
 BR95D (Wire Strippers 9) £3.95

Single-Action Wire Strippers



For precise rapid wire-stripping without risk of damage to the wire or insulation. Simply place the wire to be stripped between the jaws and squeeze the handles. The tool automatically grips the wire cuts the insulation and strips it from the wire in the one operation. The tool is made in die cast



aluminium and fitted with hardened steel cutting blades which are easily changed by the removal of two screws. The tool comes complete with blade fitted. Size: 180mm (7in). Length of strip 22mm (7/8in) max. Stripping holes are 0.5mm, 1.2mm, 1.6mm, 2mm diameter. Suits most common wires.

Order

BR96E (Single Action Strippr) £19.95

Replacement Blades for Stripmaster

Replacement blades for the Stripmaster model single action wire stripper are still available in two sizes.

L4421: Wire gauges 0.32mm² to 5.6mm² (22swg to 12swg).

L5361: Wire gauges 0.05mm² to 0.52mm² (33swg to 21swg).

Order

XX11M (Blade L4421) £8.95
 BR97F (Blade L5361) £6.95

Wire Cutter/Stripper Tool



A quick and very easy to use wire stripping tool, which has jaws to grip the wire sheath, whilst a pair of blades strip off the insulation by simply squeezing the handles. The blades do not have to be set for a specific wire thickness, but are internally sprung in order to apply just the pressure required to bite

through the insulation before moving backwards taking the insulation with them. The blades can however be adjusted by a simple thumb screw so as to operate effectively for a range of different insulation plastics. It is even possible to strip two or more wires, inserted side by side, simultaneously.

Order

FT44X (Cutter/Stripper Tool) £4.95

WIRE-WRAPPING TOOL



A combined wire stripping, wrapping and unwrapping hand tool. For use with 30 awg (33 swg) wire on a standard 0.85mm diagonal terminal pin. To use the tool put the wire through the large hole in the centre, push wire down into cutter and pull wire out of tool. This will strip the sheath. Strip about 25mm (1 in of wire). Push the bared wire into the end of the tool, into the tiny hole in the edge (not the larger hole in the centre) and if it does not push in easily run a drop of sewing machine oil in to ease it. Then when all the bared wire has been pushed into the tool (the end will come out the side) with the insulation flush with the end of the tool, bend the wire out at right angles. Now slide the larger hole in the end of the tool over the pin to be wrapped, hold the insulated wire tightly and twist the tool clockwise. If you wish to unwrap a wrapped joint, place the shorter bit on the other end of the tool over the pin and twist anticlockwise. Size: 112 x 19.5mm

Order

FY32K (Hand Wrap Tool) £8.95

TELESCOPIC INSPECTION MIRROR

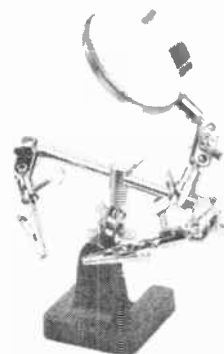


A 34mm round glass magnifying mirror supported in a metal body with double ball joint for adjustment to any angle. The handle is telescopic and is 210mm long when fully retracted, extending to a maximum reach of 685mm. Chrome plated finish.

Order

FA00A (Telescopic Insp Mirror) £8.95

HELPING HANDS



A very useful piece of apparatus which allows a PCB or any delicate work to be held in position by means of two large crocodile clips. Enables user to keep both hands free for positioning, soldering, and assembling. Six ball joints allow adjustments to the exact angles needed, and the heavy iron base prevents tipping. Available in two types, one with and one without a magnifying glass.

Order

YK52G (Helping Hands) £4.95
 YK53H (Helping Hands + Mag.) £7.95

ANTISTATIC WORK MAT

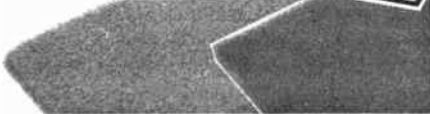


A tough conductive flexible plastic mat which can be used to prevent the build-up of static charges on devices or equipment likely to be at risk. The mat has an earthing strap which may be clamped to a suitable earth by a jubilee clip. The static charge on any item placed on the mat will leak away to earth. Computers placed on the mat will not generate spurious data when touched by someone holding a static charge for example. The mat is also useful for safe handling of CMOS devices etc.

Order

YJ90X (Antistatic Workmat) £14.95

ANTISTATIC FOAM

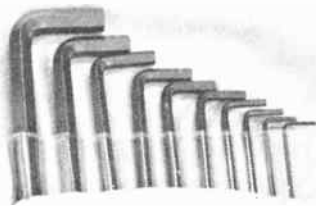


Conductive foam sheet 6mm thick in two densities. High density type is suitable for retaining IC's which may be simply pushed into the material and are held tightly in place. Low density type is very flexible for use as a packing material where static sensitive devices are being stored or packaged. Sheets are 12in x 12in (305 x 305mm).

Order

FA82D (Hidensty A/stat Foam) £3.95
FA83E (Lodensty A/stat Foam) £2.95

ALLEN KEYS



A pack of ten Allen keys available in AF or metric sizes. Both types supplied in a plastic wallet. Sizes: AF — 1/16in, 5/64in, 3/32in, 1/8in, 5/32in, 3/16in, 7/32in, 1/4in, 5/16in, and 3/8in. Metric — 1.5, 2, 2.5, 3, 4, 5, 5.5, 6, 8, and 10mm.

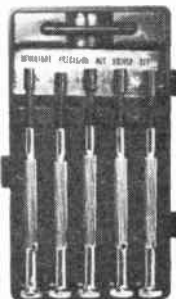
Order

FY34M (Allen Keys AF) £1.95
FY35Q (Allen Keys Metric) £1.95

SPANNERS

Miniature Nut Spinner Set

Five precision miniature nut spinners in a hinged plastic box with a transparent cover. Handles are chromed and have a swivel cap. Spanners are 3mm, 3.5mm, 4mm, 4.5mm and 5mm. The handles have a hole drilled in them and a bar is supplied which fits in the hole to give extra leverage. All tools are approx. 100mm long.



Order

YW61R (Box Spanner Set) £1.80

Miniature BA Open-Ended Spanners

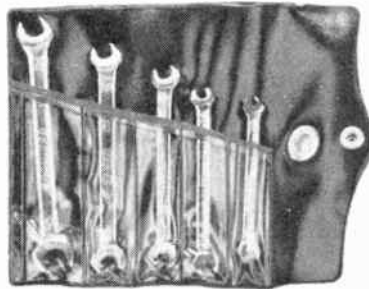


Miniature chrome vanadium open-ended spanners, chrome-plated and polished. Type 24 has 2BA one end, 4BA the other, type 68 has 6BA one end 8BA the other. Overall length: type 24: 79mm; type 68: 57mm.

Order

FY36P (Min Spanner 24) £1.40
FY37S (Min Spanner 68) £1.20

Miniature Metric Open-Ended Spanner Set

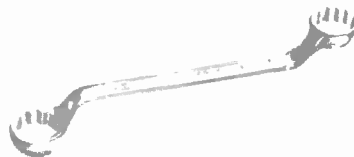


A set of five chrome plated open-ended spanners angled at 30° at each end. Sizes are as follows, overall length in brackets. 3.2 x 3.5mm (70mm), 4 x 5mm (80mm), 5.5 x 6mm (90mm), 6.5 x 7mm (100mm), 8 x 9mm (110mm). Packed in a vinyl roll-up wallet.

Order

FA66W (Metric Spanner Set) £4.95

Miniature BA Ring Spanners

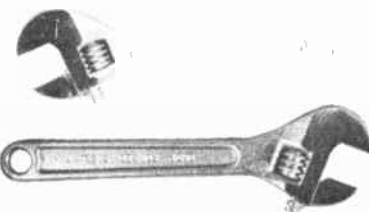


Miniature chrome vanadium ring spanner, chrome-plated and polished. Type 02 has 0BA one end, 2BA the other, type 46 has 4BA one end, 6BA the other. Overall length: Type 02: 92mm; type 46: 70mm.

Order

FY38R (Ring Spanner 02) £2.40
FY39N (Ring Spanner 46) £1.98

Adjustable Spanners



An adjustable spanner in drop-forged steel. Two sizes available.

Overall length:	Max jaw opening:
160mm	21mm
210mm	25mm

Order

FY45Y (Adjust Spanner 160) £2.95
FY46A (Adjust Spanner 210) £5.50

Box Spanners



These spanners have a tempered and hardened nickel plated tool steel shaft and good-size plastic handle for a firm grip. Available in six sizes to suit nuts that fit 2BA, 5mm, 4BA and 4mm, 3mm, 6BA and 2.5mm, and 8BA and 2mm screws. All types have plastic handles and length is 210mm (FY43W is 130mm).

Order

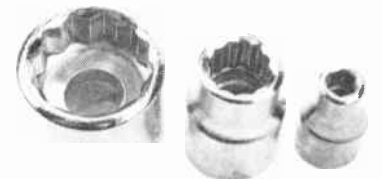
FY40T (Box Spanner 2BA) £1.95
FV56L (Box Spanner M5) £1.95
FY41U (Box Spanner 4BA) £1.95
FV57M (Box Spanner M3) £1.95
FY42V (Box Spanner 6BA) £1.95
FY43W (Box Spanner 8BA) £1.95

SOCKET SETS

39-Piece Set



A chrome vanadium steel socket set with 39 pieces. The set has both 1/4in and 3/8in drives and a 3/8in to 1/4in adaptor. Set contains 18 metric sockets, nine being 1/4in drive 6 point in the sizes 4.5, 5, 6, 7, 8, 9, 10, 11, and 12mm, and nine being 3/8in drive 12 point in the sizes 9, 10, 11, 12, 13, 14, 16, 17, and 19mm.



There are 16 AF sockets, nine being 1/4in drive 6 point in the sizes 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 7/16, and 1/2in, and seven being 3/8in drive 12 point in the sizes 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, and 3/4in. In addition the set contains one reversing ratchet handle, one spark plug socket, one spinner handle, one 3/8 to 1/4in adaptor and one extension bar. Supplied in a metal case 320 x 164 x 37mm with carrying handle. Overall weight 1.85kg.

Order

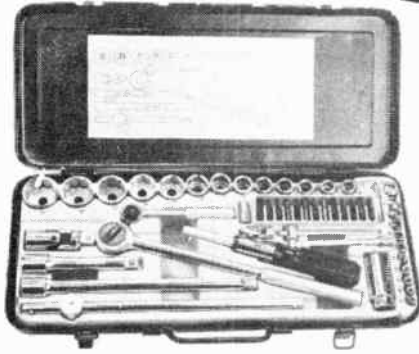
YM32K (39-piece Socket Set) £10.95



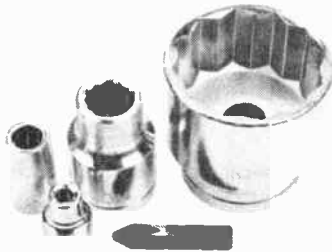
0702 552911

52-Piece Set

NEW



A chrome vanadium steel socket set with 52 pieces. The set has both 1/4in and 1/2in square drives. Set contains 24 metric sockets, eleven being 1/4in drive 6 point in the sizes 4, 4.5, 5, 5.5, 6, 7, 8, 9, 10, 11 and 13mm; and thirteen being 1/2in drive 12 point in the sizes 10, 11, 12, 13, 14, 15, 17, 19, 22, 24, 27, 30 and 32mm. There are six hex bits in 3, 4, 5, 6, 7 and 8mm sizes; three crosspoint bits nos. 1, 2 and 3; three slotted bits 4, 5.5 and 7mm; one holder bit;



three hex key wrenches 1.5, 2 and 2.5mm; and one spark plug socket. In addition there is one 1/4in and one 1/2in drive ratchet handle, one 1/4in and one 1/2in drive universal joint, one 1/4in and one 1/2in drive sliding T handle, a hex coupler, a magnetic ratchet driver, and three extension bars. Supplied in a metal case 445 x 195 x 47mm with carrying handle. Overall weight 4.75kg.

Order

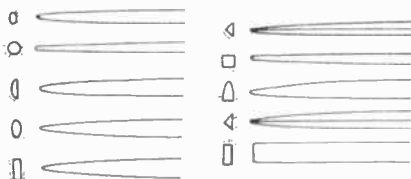
YM33L (52-piece Socket Set) £29.95

NEEDLE FILES

Needle File Set



A plastic wallet containing ten needle files of various types. All types are 140mm long, cut length 65mm. Types supplied are oval, round, half-round, crossing, threesquare, square, knife, barette, flat warding & hand.



Order

YW63T (Needle File Set) £5.95

Needle Files



A range of very high quality needle files made from the finest Sheffield steel. All types are 160mm long; cut length: 76mm. Cut number 2 (extra smooth). Four types are available: Flat Warding, Hand, Halfround and Round.

Order

FY49D (Needle File Flat Wrđ) £1.95
FY50E (Needle File Hand) £1.95
FY51F (Needle File Halfrnd) £1.95
FY52G (Needle File Round) £2.45

CENTRE PUNCH

NEW



A chrome plated, hardened and tempered, drop forged steel centre punch. Size 6 x 3/8in (15.2 x 9.5mm).

Order

FA67X (Centre Punch) 54p

JUNIOR HACKSAW



A junior hacksaw with a steel frame and 6in pinned tungsten steel blade. Packs of ten replacement blades are also available.

Order

BR63T (Junior Hacksaw) 98p
BR64U (6in Hacksaw Blades) 98p

TACKING HAMMER

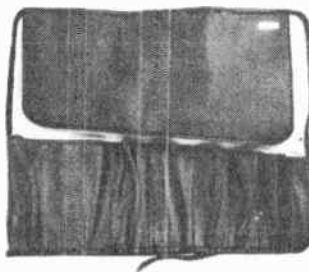


A tacking hammer particularly suitable for wiring cleats, Hiatts etc. The 4oz. (110g) drop-forged head with polished faces and sides is firmly fixed to a wooden handle. The head has a cross pein for tacking in awkward corners.

Order

FA68Y (Tacking Hammer) £2.95

TOOL ROLL



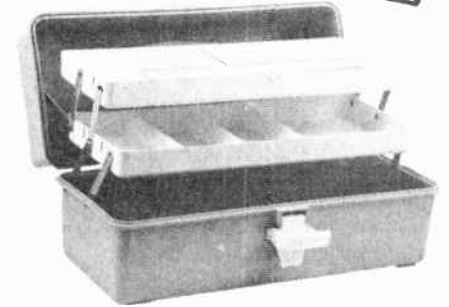
High quality tool roll made from a tough supple simulated leather on a fabric base, with edge piping, heavy stitching and a securing strap and buckle. The tool roll has 8 divisions and measures 320mm high by 380mm wide. Holders are in graduated sizes.

Order

FG07H (8 Section Tool Roll) £4.95

TOOL BOX

NEW

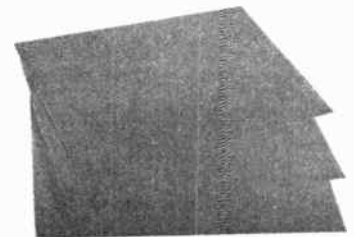


A tough, shatterproof blue plastic toolbox with hinged lid and recessed foldaway carrying handle and all plastic catch. The lid also withdraws two partitioned trays on opening. Each tray is 297 x 110mm overall by 22mm deep. The lower tray has three compartments 110 x 60mm, and one 110 x 115mm. The upper tray has one of 110 x 43mm, two of 74 x 44mm, one of 160 x 74mm, and one 34 x 253mm long. When withdrawn, the trays reveal the bottom compartment of the toolbox having a total area of 320 x 130mm, and a depth of 70mm. Overall dimensions 340 x 145 x 150mm deep.

Order

XG69A (Plastic Tool Box) £5.95

WET AND DRY ABRASIVE PAPER



A 280 x 224mm sheet of wet and dry abrasive paper. Available in three grades:

Fine: (Approx. 600 grade)
 Medium: (Approx. 320 grade)
 Coarse: (Approx. 80 grade)

Order

FY55K (Wet & Dry Fine) 16p
FY56L (Wet & Dry Med) 16p
FY57M (Wet & Dry Course) 18p

KNIVES

Utility Knife



A standard knife supplied with three blades.

Order

FY02C (Utility Knife) £1.60

Retractable Blade Knife



A retractable action trimming knife supplied with five blades. Blade retracts right back into the handle when not in use.

Order

FY03D (Retractable Knife) £2.80

Replacement Blades

A pack of ten replacement blades for use with retractable knife and utility knife.

Order

FY04E (Knife Blades) 60p

Snap-Off Blade Knife



A very useful and versatile craft knife with a retractable blade. The blade has slight scores across it and the end cap can be removed placed over a blunt blade and the end of the blade snapped off on the score. Thus one blade may effectively be made as new again twelve times before the blade needs replacing. Supplied with two extra blades.

Order

YW64U (Snap-Off Blade Knife) 98p

Scalpel



A surgical scalpel which will be found the most suitable tool for making PCB artworks using our tapes etc. They are also suitable for all kinds of accurate and delicate cutting work. The handles and blades must be ordered separately.

Handle

A small metal handle designed to hold the blades detailed below.

Order

FY05F (Scalpel Handle) £2.95

Blade

A blade to fit the scalpel handle described above. Blades are made of the finest surgical steel and are supplied in a sterile pack. Supplied in packs of five.

Order

FY06G (Scalpel Bld Type II) 48p

SHEET-METAL PUNCHES

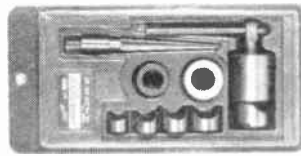


A range of punches for making holes that do not require filing or deburring, in sheet metal up to 16 swg mild steel. All punches are supplied with the appropriate allen key and full instructions. The following sizes are available: 3/16in, 7/16in, 1/2in, 9/16in, 5/8in, 3/4in, 1in, 1 1/2in.

Order

BR59P (Punch 3/8in)	£4.95
BR60Q (Punch 7/16in)	£4.95
BR61R (Punch 1/2in)	£4.95
BR62S (Punch 9/16in)	£5.30
BR80B (Punch 5/8in)	£5.45
BR81C (Punch 3/4in)	£5.45
BR83E (Punch 1in)	£6.95
BW00A (Punch 1 1/2in)	£9.95

Chassis Punch Set



A set of five punches for thin tin or aluminium sheet up to 1.6mm thick. The punches make it easy to make neat round holes where drills are not practical. Sizes are 16, 18, 20, 25 and 30mm. The set is supplied with a reamer.

Order

YK27E (Chassis Punch Set) £16.95

Hand Nibbler



A hand operated nibbling tool which will cut, trim or notch to any shape or size. Maximum cutting capacity: Sheet metal up to 0.6mm thick; Soft metal up to 1.6mm thick. Replacement blades are available.

Order

FG09K (Hand Nibbler) £9.95
FG10L (Nibbler Spare Blade) £4.95

Reamer



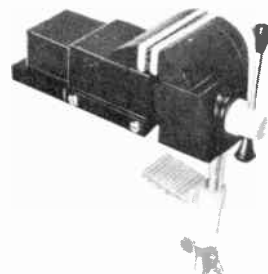
A hand operated, tapered reamer for finishing and deburring panel holes. Made from carbon-chrome alloy steel, it may also be useful in opening holes out to non-preferred diameters. Will cover holes from 3mm up to 12mm (1/8 to 1/2in).

Order

FG11M (Reamer) £3.95

VICES & CLAMPS

Miniature Vice



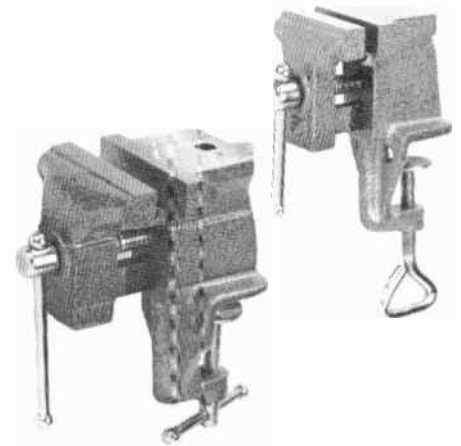
A small modellers vice in a tough plastic construction with metal faced jaws. Vice clamps to a bench of maximum thickness 45mm. Jaw width: 41mm. Max opening 30mm. Overall dimensions fully closed (excluding bench clamp): 112mm long x 44mm wide x 43mm high.

Order

FY53H (Mini Vice) £4.95

Bench Vices

NEW



Two good quality steel bench mounting vices with smooth jaws. 2 inch type fixes to benches from 2mm to 32mm thick. Jaw width 50mm, max opening 40mm. 3 inch type fixes to benches from 13mm to 46mm thick. Jaw width 75mm, max opening 60mm. Finished in hammertone.

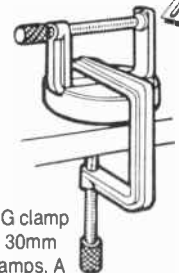
Order

YJ83E (2 inch Vice) £7.95
YJ84F (3 inch Vice) £14.95

G Clamp Set

NEW

Two clamps used with the magnetic base can achieve a useful bench vice.



A three piece, diecast G clamp set comprising 20mm, 30mm and 40mm capacity clamps. A nylon shoe on the end of the threaded screw protects the workpiece. The screw is operated by a knurled knob. A round, magnetic base is included, which incorporates a slot to accept any of the three clamp frames, such that two may be combined to form a small table edge vice, or to make the clamp free-standing for holding small items. Ideal as a third hand for holding pcb's etc., holding together small objects being bonded, and many other uses.

Order

FT76H (Mini G Clamp Set) £4.95

DRILLS

Spiral Hand Drill

NEW



A brass precision spiral hand-drill ideal for drilling pcb's and for general modelling work. Simply pulling the runner up and down turns the drill. The adjustable chuck will hold drills from 0.6mm to 1.2mm. An 85mm x 4.5mm centre punch is also supplied. Overall length 145mm.

Order

FV58N (Spiral Hand Drill) £7.95

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Maplin SHOP
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Reliant Electric Drill

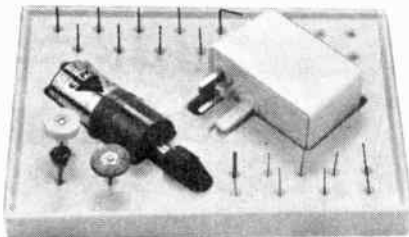


A sub-miniature 12V electric drill suitable for drilling printed circuit boards etc, and similarly light duties. Features the latest automatic 3 jaw pin chuck with up to 1/16in capacity.

Rated voltage: 12V DC
 No load current: 175mA
 Full load current: 1.5A
 Torque: 100gm cm
 Speed: 9000 rpm \pm 7 1/2%
 Body dimensions: 76mm long x 33mm diameter
 Weight: 160gms

Order
BW03D (Reliant Drill) £8.50

Reliant Drill Kit



A kit comprising the Reliant electric drill, fitted with latest automatic 3 jaw pin chuck, adjustable to take any size drill bit up to 1/16in dia. Kit includes 16 twist drills, one axial brush, one radial brush, polishing pad, tommy bar and allen key. A mains adaptor is included in the kit.

Order
LH79L (Reliant Kit) £28.95

Titan Electric Drill



A miniature 12V electric drill suitable for drilling printed circuit boards, thin aluminium sheet and similar light duties. Features new automatic 3 jaw pin chuck with 1/16in capacity.

Rated voltage: 12V DC
 No load current: 0.45A
 Full load current: 3.5A
 Torque: 1000 gm cm
 Speed: 4000-9000 rpm
 Body dimensions: 114mm long x 38mm dia.
 Weight: 255gms

Order
BW02C (Titan Drill) £12.95

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Saturn Mains Drill

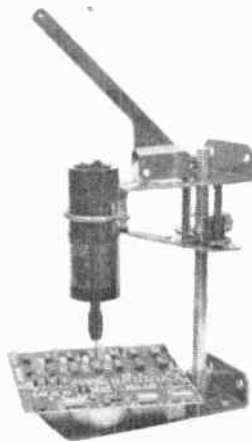
A miniature electric drill operating directly on 240V mains. Suitable for drilling pcb's, thin metal sheet etc. Mains cable is about 2m long. Has 3 jaw chuck as Reliant and Titan drills.



Rated voltage: 220 - 240V AC
 Operating current: 160mA off-load, 410mA full-load
 Off-load speed: 23,500 rpm
 Full-load speed: 7,700 rpm
 Max torque: 450gm/cm
 Body dimensions: 127 x 57mm
 Weight: 400gms

Order
YW65V (Mini Mains Drill) £15.95

Drill Stand



A drill stand which suits the Titan drill and also the Reliant drill if the special collar is fitted. Lever on stand lowers drill for drilling operation; thus alignment for hole can be made very accurately.

Order
XB12N (Drill Stand) £16.95

Collar For Drill Stand

A collar which fits around the Reliant drill to enable it to be clamped into the drill stand.

Order
BR84F (Reliant Collar) 80p

Mains Power Unit



A power unit for driving the Titan or Reliant drills from the mains. Power unit output is nominally 12V DC and will deliver up to 4A.

Order
BW04E (Drill Power Supply) £14.95

Burrs



Two burrs suitable for making shaped holes; and cleaning out holes etc. Both have 2.35mm shanks for use with the Reliant, Titan or Saturn drills. Two sizes are available: 0.8mm dia; 1.4mm dia.

Order
BR65V (Twist Burr 0.8mm) 45p
BR66W (Twist Burr 1.4mm) 45p

Drill Bits with 2.35mm Shank



A range of high speed drill bits all with 2.35mm shanks designed for use with the older type Reliant, Titan or Mini Mains drills that do not have the new 3-jaw pin chucks. The following sizes are available: 0.8mm (for IC pins), 1mm (for most components), 1.4mm (for presets etc).

Order
BR85G (HS Twist Drill 0.8mm) 78p
BR86T (HS Twist Drill 1mm) 86p
BR87U (HS Twist Drill 1.4mm) 78p

Long Life Drill



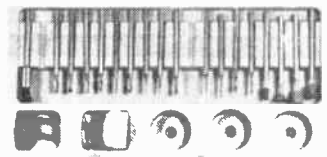
A heavily coated twist drill with a considerably extended life. Ideal for drilling glass fibre pcb's where it should drill several hundred holes before blunting. Suitable for use with either the new or old style Reliant, Titan or Mini Mains drills. Available only in 1mm.

Order
YY28F (Long-Life Drill 1mm) £1.35

Tool Sets

Packs of tools with 2.35mm shanks to fit our Reliant, Titan and Mini Mains electric drills. Two are available, one with 20 pieces and one with 40 pieces.

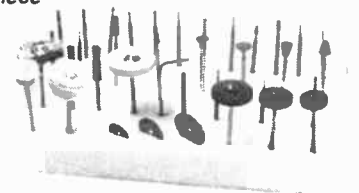
20-Piece



Tools vary, but a typical set comprises four drills, four abrasives, nine burrs of various shapes, one polishing pad, one radial brush and one axial brush.

Order
LH77J (20-Piece Tool Kit) £9.45

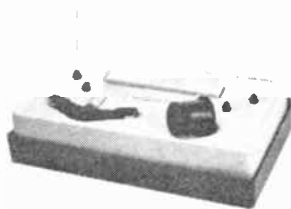
40-Piece



Tools vary, but a typical set comprises three drills, six abrasives, 14 burrs of various shapes, two polishing pads, four brushes, three axial and one radial, three mandrels on which fit three abrasives, or three saws of different sizes, one tommy bar and one allen key.

Order
LH78K (40-Piece Tool Kit) £17.95

Drill Sharpening Kit



A sharpening kit for drills up to 1/2in diameter. It is carefully designed to enable anyone to restore blunt and broken drills to virtually 'as new' condition in a few minutes without any special skill. First class results can be obtained every time by following the simple instructions. Kit comprises 1 Wishbone Sharpener, 4 Collets (to suit any drill up to 1/2in diameter), 1 Drill Setting Gauge, 1 Stone and 1 Eyepiece Magnifier.

Order

LH76H (Drill Sharpener) £7.75

Pin Drill



A 55mm long pin drill with a 3-jaw chuck having a capacity up to 1/2in.

Order

YW66W (Pin Drill) £4.95

High Speed Metric Drills NEW

A range of miniature high speed steel straight shank twist drills in metric sizes. Ideal for metal and suitable for pcb's.

Order

QY64U (Metric Drill 0.8mm)	35p
QY65V (Metric Drill 1mm)	35p
QY90X (Metric Drill 1.2mm)	20p
QY66W (Metric Drill 1.4mm)	35p
QY91Y (Metric Drill 1.5mm)	20p
QY92A (Metric Drill 1.6mm)	28p
QY93B (Metric Drill 1.8mm)	28p
QY94C (Metric Drill 2mm)	28p
QY95D (Metric Drill 2.5mm)	35p
FV60Q (Metric Drill 3mm)	40p
FV61R (Metric Drill 3.5mm)	45p
FV62S (Metric Drill 4mm)	50p
FV63T (Metric Drill 5mm)	65p
FV64U (Metric Drill 6mm)	78p

High Speed Twist Drills

A range of good quality high speed twist drills for metal. The following sizes are available:

Order

HQ02C (HS Drill 1/16in)	20p
HQ03D (HS Drill 5/64in)	28p
HQ04E (HS Drill 3/32in)	32p
HQ05F (HS Drill 7/64in)	34p
HQ06G (HS Drill 1/8in)	40p
HQ07H (HS Drill 9/64in)	45p
HQ08J (HS Drill 5/32in)	48p
HQ10L (HS Drill 3/16in)	58p
HQ12N (HS Drill 7/32in)	68p
HQ14Q (HS Drill 1/4in)	78p
HQ16S (HS Drill 9/32in)	98p
HQ18U (HS Drill 5/16in)	£1.28
HQ22Y (HS Drill 3/8in)	£1.54
HQ26D (HS Drill 7/16in)	£2.20
HQ29G (HS Drill 1/2in)	£2.80

Masonry Drills

NEW

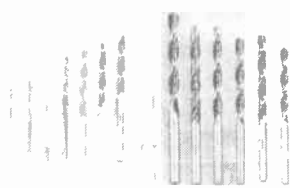


Tungsten carbide tipped masonry drills with a special flute spiral for fast material removal. 3/16 and 1/4in sizes have straight shanks 85mm long for use with hand or power drills. The 3/16in drill has a reduced shank 3/16in and length is 120mm.

Order

FV65V (Masonry Drill 3/16)	54p
FV66W (Masonry Drill 1/4)	60p
FV67X (Masonry Drill 3/8)	£1.30

Light Duty Twist Drill Set



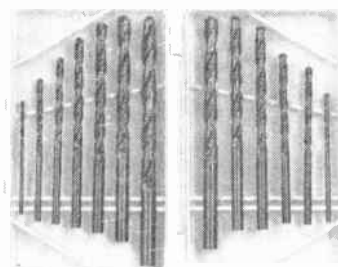
Manufactured from chrome vanadium steel with accurately ground cutting edges and straight shanks. These drills can be used with hand or power drills on wood, mild steel, soft non-ferrous metals, plastics, etc. The sets come in a tough hinged plastic storage case. Contains 13 metric size drills which accurately match the following imperial sizes:

1/16in, 3/64in, 3/32in, 7/64in, 1/8in, 9/64in, 5/32in, 11/64in, 3/16in, 13/64in, 7/32in, 15/64in, 1/4in.

Order

FG05F (13pc Twist Drill Set) £3.95

High Speed Twist Drill Set

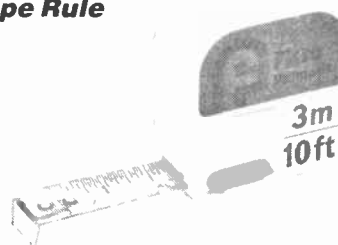


Identical to the above set of drills, but manufactured in high speed steel.

Order

FM97F (HSS Drill Set) £6.95

RULERS Tape Rule

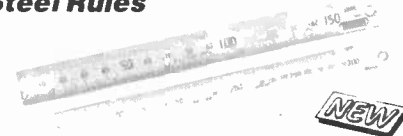


A 10ft (3m) metal tape rule marked in inches and metres. It has a smart square plastic case and tape springs back. A locking device is also fitted as well as a belt clip. Size: 50 x 54 x 20mm. The tape is 13mm wide and has a sliding tip for accurate end-on or hook-over measurements.

Order

FY59P (Retractable Rule) £2.95

Steel Rules



6 inch (150mm) and 12 inch (300mm) stainless steel rules having imperial graduations in 1/64, 1/50, 1/32, 1/20, 1/16 and 1/10th inches and on the reverse side metric graduations in 0.5 and 1mm steps. Overall size 6 inch: 175 x 15 x 0.5mm; 12 inch: 336 x 25 x 1mm.

Order

FA69A (6" Stainls Stl Rule)	£1.50
FT75S (12" Stainls Stl Rule)	£3.45

TYRE PRESSURE GAUGE



A chrome plated tyre pressure gauge with pocket clip. Gauge measures from 6 to 50lbs/sq. in. and includes a valve extractor tool. Overall length: 112mm.

Order

FY01B (Tyre Pressure Gauge) £2.25

SOLDERING IRONS 15W Miniature Soldering Iron Type C



A 15W miniature 240V AC soldering iron which has a heating element contained in a stainless steel shaft, such that the heat is transferred to the bit with maximum efficiency. The soldering bit (No. 820 fitted) can be easily removed from the stainless steel shaft for replacement. Ideal for light duty and PCB soldering jobs where not too much heat is required. Fitted with 1.8 metres of mains cable.

Specification

Power consumption:	15 watts
Breakdown Voltage:	900 volts
Current leakage:	10µA
Length:	160mm (6 1/2in)
Weight:	28gms (1 oz)

Order

FJ44X (Iron Type C) £5.95

Type C & CN Replacement Element

A 240V replacement element for the irons type C and CN.

Order

FR01B (Element Type CN) £3.25

Type CN Replacement Handle

A replacement handle for the iron type CN240.

Order

FR02C (Handle Type CN) £1.65

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17W Miniature Soldering Iron Type CS



A 17W precision miniature soldering iron featuring a double shaft. An inner shaft of ceramic provides a very low leakage current of $<2\mu\text{A}$, and has an outer stainless steel sleeve for strength. It is intended for use with modern miniature components. The iron comes fitted with a Bit No. 1100, but many alternative bits are available. 240V AC mains operated. Fitted with 1.8 metres of mains lead.

Specification:
 Power consumption: 17 watts
 Breakdown voltage: $>2,500\text{V}$
 Leakage current: $<2\mu\text{A}$
 Max bit temperature: 370°C
 Length: 180mm
 Weight: 40gm (1 1/2oz).

Order
FY62S (Iron CS) £6.25

Type CS Replacement Element

A 240V AC mains replacement element for the CS model iron.

Order
FY95D (Element CS 240V) £3.25

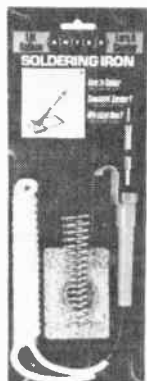
Type CX Replacement Element

A replacement 240V AC mains element is still available for the CX model iron.

Order
FY63T (Element CX) £3.95

Soldering Iron Kit SK5

An attractive presentation kit that makes the perfect present for the beginner. A superb CS soldering iron and a Stand ST4 neatly packaged with full instructions on how to use the iron as well as some general hints on soldering.



Order
FY68Y (CS Kit SK5) £10.95

25 Watt Soldering Iron Type XS



A strongly recommended 25W 240V mains soldering iron ideal for soldering transistors and integrated circuits since the leakage current is $<1\mu\text{A}$. It has a shatterproof handle and detachable hook. The iron is designed to use the same bits as the X25 model which it replaces. The iron comes fitted with a Bit No. 51. 240V AC mains operated, with 1.8 metres of mains lead attached.

Specification:
 Power consumption: 25 watts
 Breakdown voltage: $>2,500\text{V}$
 Leakage current: $<1\mu\text{A}$
 Max bit temperature: 390°C
 Length: 180mm
 Weight: 55gms

Order
FR12N (Iron XS) £6.50

Type XS Replacement Element

A replacement 240V AC mains element for the XS model iron.

Order
FY96E (Element XS 240V) £3.25

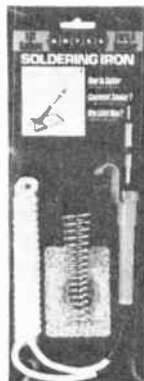
Iron X25 Replacement Element

A replacement 240V AC mains element is still available for the X25 model iron.

Order
FR14Q (Element X25) £3.95

Soldering Iron Kit SK6

An attractive presentation kit that makes the perfect present for the beginner. A superb XS soldering iron and a Stand ST4 neatly packaged with full instructions on how to use the iron as well as some general hints on soldering.



Order
FY69A (XS Kit SK6) £11.45

Low Voltage Soldering Iron MLXS

A low voltage 25 watt soldering iron designed to work from a 12V car battery. The iron has the same specifications as the XS mains iron, and replaces the MLX12 model iron. The bits are interchangeable with the XS iron. The MLXS is supplied with an 1/16in bit (bit no. 51), two large crocodile clips for connection to battery terminals, and 4.5 metres of 2-core lead, (all ready fitted). A tough plastic wallet is provided to house the iron when not in use.



Order
FR13P (12V Iron MLXS) £10.95

Type MLXS Replacement Element

A replacement 12V element for the MLXS model 12V iron.

Order
FY97F (Element MLXS 12V) £3.25

Type MLX12 Replacement Element

Replacement 12V elements for Iron MLX12 are still available.

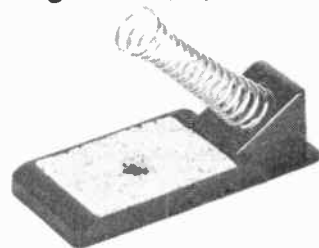
Order
FR15R (Element MLX12) £3.45

Replacement Hook for CS and XS Irons

A replacement hook/finger guard to fit the CS, XS and MLXS type irons.

Order
FT09K (Finger Hook CS/XS) 20p

Soldering Iron Stand



A stand designed for use with all our soldering irons. Manufactured from a high grade insulation material with a chromium plated strong steel spring. The sponge serves (when dampened) to keep the soldering bits clean. Spare bits can be accommodated on the stand.

Order
FR20W (Stand ST4) £2.95

Replacement Sponge for Stand ST4

A spare sponge is available as a replacement for use with the stand ST4, and is also used with the temperature controlled soldering iron system TCSU-1 below.

Order
RK33L (Sponge ST4) 35p

Replacement Sponge for Stand ST3

Spare sponges for the discontinued Stand ST3 are still available.

Order
FR11M (Sponge ST3) 24p

TEMPERATURE CONTROLLED IRONS Model TCSU1



A very robust soldering unit with a choice of 30W (CSTC) or 40W (XSTC) temperature controlled irons. Temperature range is controllable from 65°C to 420°C with an accuracy of 2% using a slider control. Electronically controlled zero voltage switching of the heating element is employed to avoid radiated fields and transient pulses, and a thermocouple near the tip of the iron provides for feedback control. The iron

which must be ordered separately plugs into the controller's 24V output via a 5-pin DIN plug and socket and 1.2m of silicone covered 5-core cable, completely isolating the user from the mains voltage. The TCSU-1 has the additional provision of a separate earthing jack, into which a cable can be plugged terminating in a crocodile clip, which when attached to the work nullifies any static charge problems developing between the iron and the work. Provided with a separate sponge tray. The control unit is fitted with 1.8 metres of mains lead.

Specification:

Power consumption: 60 watts max
 Voltage output: 24 to 26V AC
 Dimensions: 145 x 104 x 142mm
 Weight: 1.6kg (3½lbs)

Order

XG55K (Solder Station TCSU1) £79.95

Irons for TCSU-1

30 Watt Iron CSTC



A 30 watt iron for use with the TCSU-1 controller. The iron is fitted with 1.2 metres of 5-core cable terminated in a 5-pin DIN plug, and is supplied with three bits.

Max power: 30 watts
 Current leakage: Negligible
 Length: 160mm
 Standard bit: 102
 Alternative bits: 106, 10
 Weight, with cable: 90gm

Order

FT13P (30 Watt Iron CSTC) £19.95

Replacement CSTC Element

A replacement heating element for the 30 watt CSTC iron.

Order

FT26D (CSTC Element) £11.95

40 Watt Iron XSTC



A 40 watt XSTC iron for use with the TCSU-1 controller. The iron is fitted with 1.2 metres of 5-core cable terminated in a 5-pin DIN plug, and is supplied with three bits.

Max power: 40 watts
 Current leakage: Negligible
 Length: 200mm
 Standard bit: 1101
 Alternative bits: 1100, 1102
 Weight, with cable: 140gm

Order

FT28F (40 Watt Iron XSTC) £19.95

Replacement XSTC Element

A replacement heating element for the 40 watt XSTC iron.

Order

FT27E (XSTC Element) £11.95

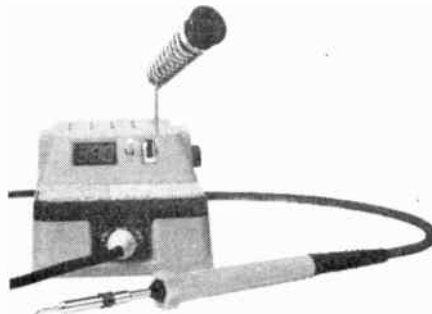
TCSU-1 Sponge Tray

A spare sponge tray for the TCSU-1 which takes the same size sponges as does the stand ST4 above.

Order

FT10L (Sponge Tray TCSU-1) £1.65

Model TCSU-D



An elegantly designed, moderately priced, 240V AC temperature controlled soldering unit giving an accurate and continuous display of soldering tip temperature. The unit is built around a unique ULA: custom-built by Ferranti. Temperature range is adjustable by means of setting the temperature required in degrees centigrade on the display. The control unit is then allowed to 'run' whereupon it will maintain the soldering tip at that temperature. The range is from ambient to 495°C, with an accuracy of ±5°C, handled by a 50W soldering iron type XSD. Other features include zero crossing switching control and a detachable sponge tray. The iron is fitted with 1.2 metres of 5-core cable which plugs into the control unit's 5-pin DIN socket.

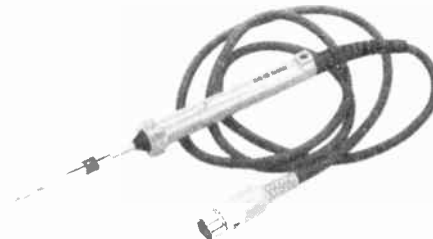
Specification:

Control unit:
 Power consumption: 60 watts
 Output voltage: 24 to 26V AC
 Dimensions: 200 x 110 x 70mm
 Weight: 1kg
 Iron:
 Power: 50 watts max
 Current leakage: Negligible
 Standard bit fitted: 1100
 Length: 200mm
 Weight: 150gm

Order

XG57M (Solder Station TCSUD) £89.95

Replacement Iron for TCSU-D



A replacement 50 watt iron type XSD for use with the TCSU-D controller. The iron is fitted with a bit No. 1100, plus 1.2 metres of 5-core cable terminated in a 5-pin DIN plug.

Order

FT12N (50 Watt Iron XSD) £19.95

Replacement Element for Iron XSD

A replacement 50 watt heating element for the XSD iron used with the TCSU-D controller.

Order

FT29G (XSD Element) £11.95

TCSU-D Sponge Tray

A spare sponge tray for the TCSU-D controller unit.

Order

FT11M (Sponge Tray TCSU-D) 99p

TCSU-D Sponge

A replacement sponge for the TCSU-D sponge tray.

Order

FT08J (Sponge TCSU-D) 30p

REPLACEMENT BITS

A range of replacement bits for all our soldering irons excluding the rechargeable iron. These bits are all iron clad to give long life and they must therefore not be filed or they will quickly disintegrate. They should only be cleaned by wiping with a damp sponge when they are hot. The following types are available:

Type No.	Tip Size	For Iron	
102	2.3mm	C, CSTC	
103	4mm	C	
104	4.7mm	C	
106	1mm	C, CSTC	
820	2.3mm	C	
821	3mm	C	
822	4.7mm	C	
202	2.3mm*	C	
302	2.3mm	C	
10	0.5mm	CSTC	
1100	2.3mm	CS, XSTC, XSD, CX	
1101	3mm	CS, XSTC, CX	
1102	4.7mm	CS, XSTC, CX	
1103	6mm	CS, CX	
1106	1mm	CS, CX	
50	2.3mm	XS, X25, MLXS	
51	3mm	XS, X25, MLXS	
52	4.7mm	XS, X25, MLXS	
53	2.3mm*	XS, X25, MLXS	
54	3mm*	XS, X25, MLXS	
14A	19mm†	XS, X25	

* Chiselled tip. † Desolder head.

Order

FR03D (Bit 102)	£1.30
FT00A (Bit 103 C)	£1.30
FR04E (Bit 104)	£1.30
FR05F (Bit 106)	£1.30
FR06G (Bit 820)	£1.30
FR07H (Bit 821)	£1.30
FR08J (Bit 822)	£1.30
FT01B (Bit 202 C)	£1.30
FT02C (Bit 302 C)	£1.30
FT03D (Bit 10 C)	£1.30
FY64U (Bit 1100)	£1.30
FY65V (Bit 1101)	£1.30
FY66W (Bit 1102)	£1.30
FY67X (Bit 1103)	£1.30
FR30H (Bit 1106)	£1.30
FR16S (Bit No. 50)	£1.30
FR17T (Bit No. 51)	£1.30
FR18U (Bit No. 52)	£1.30
FT04E (Bit 53 XS)	£1.55
FT05F (Bit 54 XS)	£1.55
FT06G (Bit 14A XS)	£4.25

RECHARGEABLE SOLDERING IRON



A portable rechargeable soldering iron complete with recharging unit. The iron may be completely recharged in about 8 hours, but recharging may continue indefinitely without damage. After charging the iron will make about 350 solder joints in one continuous operation using the switch to control the temperature or about 100 solder joints if the tip has to heat from cold for every joint. Tip temperature is about 350°C and this temperature is reached in less than 9 seconds from cold. The non-locking heating switch has a safety catch to prevent accidental operation. The recharging unit may be used as a stand for the iron and if connected to mains will also recharge the iron between uses. The iron is supplied complete with recharging unit, three long-life solder tips from 1.5mm² to 6mm², approx 750mm of solder, small screwdriver, cleaning sponge (which must be kept damp when in use), two lamp fittings complete with bulbs to give a very bright illumination at the tip (though number of solder joints per charge are reduced by about 7% per fitting) and a lamps holder. The recharging unit is supplied with 2.5m of mains lead terminated in a continental 2-pin plug that must be cut off and the lead reconnected to a standard 13A mains plug. Alternatively a proper continental plug adaptor could be used, but do NOT use a shaver adaptor, as the plug fits loosely and the iron will not charge. Supplied with instruction leaflet.

Order

WY05F (Rechargeable Iron) £34.95

Bits For Rechargeable Iron



A pair of bits for use with rechargeable iron. These bits are all iron clad extra long life types and they must not be filed or they will quickly disintegrate. They should only be cleaned by wiping with a damp sponge when they are hot. The following types are available.

Type	Tip Size
Angled	1mm
Flattened	3 x 1mm

Order

YX68Y (Bit Angled) £3.95
YX69A (Bit Flattened) £4.45

Replacement Parts for Rechargeable Soldering Iron

Spare lamp fitting, lamp holder and sponge.

Order

YX70M (Recharge Iron Lamp) 95p
YX71N (Recharge Iron Holder) 95p
YX72P (Recharge Iron Sponge) 35p

SOLDERING AID SET



A set of three useful soldering aids ideal for printed circuit board work. Each tool has two different ends, and the six available in this set are a reamer, a hook, a knife, a scraper, a brush, and a fork. The set comes complete with a plastic wallet.

Order

FG08J (Soldering Aid Set) £3.95

HEAT SHUNT

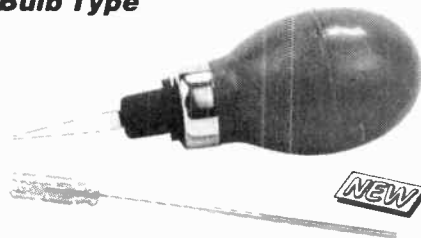


A pair of locking metal tweezers which when clipped to a transistor lead for example, will prevent the heat of soldering reaching the device.

Order

FR10L (Heat Sink Tweezers) 48p

DESOLDERING TOOLS Bulb Type



A handy inexpensive tool for the quick removal of solder. Small lightweight and easy to use. The Teflon tip is easily changed or replaced with the spare nozzle available separately. A rod is supplied with the sucker which pushes into the nozzle to clear collected solder.

Order

FR23A (Sucksolder) £2.95
FV59P (Sucksolder Tiptet) 80p

Solder Sucker Tiptet

A replacement tiptet for the old-style Solder Sucker.

Order

FR24B (Solder Sucker Tiptet) £1.60

Desoldering Tool



Powerful desoldering tool quickly removes molten solder from joint. Spring-loaded piston is closed while solder is being melted, then released by a simple push-button. The nozzle is easily removed for cleaning or replacement. Plunger is shrouded so that the knob cannot spring up into the operator's face or eyes.

Order

FR26D (Desolder Tool) £3.95

Replacement Nozzle

A replacement Teflon nozzle assembly for the above desoldering tool.

Order

FM88V (Desolder Nozzle 4) 98p

Desolder Nozzle Type 3

A replacement nozzle to suit the fully enclosed desolder tool that we were supplying from April 1982 to October 1984.

Order

BK39N (Desolder nozzle 3) 98p

Replacement O Rings

A set of replacement 'O' rings to suit the desolder tool that we were supplying from April 1982 to October 1984.

Order

BK40T (Replacement O rings) 60p

Desolder Washer Type 2

A replacement foam washer to suit the desolder tool that we were supplying from mid-April 1978 to March 1982.

Order

FR63T (Desldr Washer Type 2) 60p

Desolder Nozzle Type 2

A replacement nozzle to suit the desolder tool that we were supplying from mid-April 1978 to March 1982.

Order

HY13P (Desldr Nozzle Type 2) £1.20

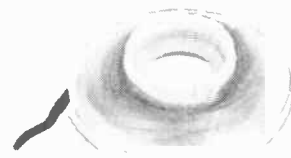
Desolder Nozzle

A replacement nozzle to suit the open style desolder tools which we were supplying prior to mid-April 1978.

Order

FR28F (Desolder Nozzle) £1.60

DESOLDER BRAID



A flux-impregnated copper braid approx. 1.5m long which speedily removes unwanted solder from a joint. Place braid on defective joint and apply soldering iron for about one second. Then remove braid and iron together and joint will be left clean. Braid width: 2mm.

Order

FR29G (Solda-Mop) 60p



HIGH POWER LOUDSPEAKERS for the BIG sound

SOLDER Standard Solder



A 60% tin, 40% lead alloy solder containing five cores of non-corrosive flux. We recommend this solder for use with the iron-clad and nickel-clad bits supplied with our soldering irons and for use with all the electronic components shown in this catalogue. Melting temperature 188°C. Suggested bit temperature 248°C. Solder is available in 18 swg (1.22mm) and 22 swg (0.71mm). 18 swg is sold in packs of 5m and on ½kg reels (approx 61m). 22 swg is sold in packs of 10m and on ½kg reels (approx 178m).

Order

FV53H (5 Mtr Pk 18swg Soldr)	88p
FR21X (Solder 22swg 10m pk)	80p
YJ92A (18 swg Solder Reel)	£9.95
FY70M (22 swg Solder Reel)	£9.95

Aluminium Solder



A specially designed solder that will joint aluminium, brass, copper, nickel, stainless steel and tin-plate more easily than standard solder. This solder is 18% tin, 80% lead and 2% silver alloy. A higher temperature is required to melt this solder than ordinary solder so it is unlikely that a miniature iron will be satisfactory unless the volume of the parts to be jointed is very small. The solder contains four cores of non-corrosive flux. Melting temperature 270°C. Solder is 16 s.w.g. (1.63mm) Sold only in packs of 1m.

Order

FY71N (Aluminium Solder)	80p
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SERVICE AIDS Electrically Conductive Silver Paint



An air drying electrically conductive paint containing pure silver. The paint should be applied to dry, grease and oil free surfaces with a soft bristled brush to obtain as thin a coating as possible to ensure minimum resistance. After approx 15 minutes the paint will be dry, but is not completely cured for 12 hours. The resistance will be about 0.001Ω per cm. However, by applying heat (e.g. from a hair dryer) to speed the drying time immediately after application the resistance can be reduced to less than 0.5mΩ per cm. Before use always shake the tube well. Applications include: repairing broken tracks on pcb's; repairing demisters on car rear windows; bonding wires together; rf shielding; prototype pcb manufacturing; conductive ink and many more. Supplied in a phial containing 3gm. Note: Shake well before use.

Order

FY72P (Conductive Paint)	£4.95
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Contact Cleaner Lubricant

An electro-mechanical lubricant in aerosol form. It consists of a solvent suspended oil for use where a thin film of contact lubricant is required having good penetrating and cleaning properties. It is non-flammable, and safe to use on all metals and most plastics and rubbers. Supplied in 300gm aerosol can.



Order

LH03D (Switch Cleaner)	£1.80
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Contact Cleaner Lubricant Pen



Identical with the aerosol electro-mechanical lubricant above, but in the form of a pen containing 5ml.

Order

FM77J (Switch Cleaner Pen)	98p
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Contact Lubricant

An extra high quality contact treatment oil for preserving long term reliability and performance. It is anti-static, and safe to use on most plastics, paints and rubbers. Supplied in 300gm aerosol can.



Order

FM78K (Contact Lubricant)	£2.80
---------------------------	-------

Contact Treatment Grease

A grease version of the contact treatment oil FM78K. A high quality, non-melting, tenacious grease giving better protection for vertical surfaces, sliding contacts and connections than FM78K. It is antistatic and is safe on most plastics, paints and rubbers. Supplied in 300gm aerosol can.



Order

YM37S (Contact Grease)	£2.80
------------------------	-------

Freezer Spray

A non-corrosive refrigerant aerosol for the rapid cooling of electronic components as an aid in tracking down and detecting thermally related faults. Can also find invaluable uses such as cooling semiconductors during soldering to prevent damage, and/or shrinking mechanical components having an interference fit with one another and thereby making fitting easier. The freezer spray can lower temperature to as much as -56°C (70°C below ambient). Supplied in 300gm aerosol can.



Order

LH04E (Freezer Spray)	£1.95
-----------------------	-------

Degreasing Solvent

A fast drying, non-toxic electronic cleaning and degreasing solvent which is non-flammable and leaves no residue. Intended for delicate electronic and electrical components and contacts, and also precision components. It is harmless to plastics and rubbers etc. Supplied in a 300gm aerosol.



Order

LH02C (Degreasing Spray)	£1.95
--------------------------	-------

Sprayduster

Simply contains a microscopically clean, inert gas which is non-toxic, non-flammable and non-corrosive, for use as a pressurised gas jet for clearing accumulated debris, dust and fluff from otherwise inaccessible nooks and crannies of radio and TV chassis, variable capacitor assemblies and similarly difficult and sensitive areas where any alternative attempt at cleaning may cause damage. Supplied in 164gm aerosol can.



Order

YB73Q (Spray Duster)	£3.20
----------------------	-------

Silicone Grease

A high quality, tenacious, electrically insulating compound which is resistant to water and extremes of temperature. It has the property of preventing high voltage tracking, arcing or corona discharge. It makes an excellent releasing agent whilst casting resin in a mould, for example. Will not harden with age. Supplied in 300gm aerosol can.



Order

YB74R (Silicone Grease)	£1.80
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Anti-Static Foam Cleanser

In addition to its ability to remove grease and grime this foaming cleanser has lasting anti-static properties, defeating static charges, eliminating dust attraction and preventing the advent of further static charges for long periods. Particularly suitable for all hard surfaces and crackle finish paints. If in doubt about its suitability for a particular surface test a small area first before using. Supplied in a 200gm aerosol can.



Order

YB76H (Foam Cleanser)	£1.60
-----------------------	-------

**CALL IN TO YOUR LOCAL
Maplin SHOP
in SOUTHAMPTON**
46 Bevois Valley Road. ☎0703 225831

Antistatic Polish

A high grade polish containing a blend of waxes, cleansing and anti-static agents. Cleans at the same time as it polishes. Can be used on wood, paint, glass, metal, plastic surfaces etc. Leaves a high gloss durable finish. Supplied in 289gm aerosol can.



Order

YB78K (Antistatic Polish) £2.80

Antistatic Spray

A water based antistatic spray in a pump action container, used for nullifying static charge problems. Supplied in a 250ml bottle.



Order

YB79L (Anti-Static Spray) £1.95

Cleaning Strips



A unique cleaning, lubrication and protection treatment for relay and other non-wiping switch contacts, edge connectors etc, and other contacts requiring only a thin film of protective lubricant. For very dirty contacts use a solvent first. For heavy duty contacts especially where arcing occurs the treatment should be followed up with an aerosol contact lubricant. Supplied in packets containing 20 strips.

Order

FM79L (Cleaning Strips) 98p

Safepads



Solvent impregnated pads for cleaning the edge connectors of printed circuit boards. Supplied as two sachets with one Safepad in each sachet.

Order

FM81C (Safe Pads Sachet) 28p

**PHONE NOW
0702 552911**



Access, Visa, American Express, Mapcard.
Phone before 2pm for same day despatch.

Safecleans

An anti-static cleaner particularly for VDU and TV screens, etc. It is approved by manufacturers of anti-glare coatings. Used in conjunction with Safewipes it removes dust, dirt, finger marks and nicotine stains whilst at the same time eliminating static charges. This reduces eye-strain and errors caused by a blurred display. It would also be most useful for cleaning the glass of photocopiers, microfilm readers and lenses, and will also remove typewriter ribbon ink from the hands. Supplied in 250ml pump action bottle.



Order

YK91Y (Safecleans) £3.95

Safebuds

Small cotton buds on sticks to used with Safecleans for awkward or fiddly cleaning jobs. 150mm in length. Supplied in packs of ten.

Order

YK98G (Data Buds Pk of 10) 18p

Safewipe

Lint free cotton squares 230 x 230mm, which are used with Safecleans for cleaning VDU screens etc. Due to their lint free nature they can be safely used for very delicate cleaning operations on component parts of computer hardware. Supplied individually.

Order

YK99H (Data Wipes) 24p

Permagard

Similar to the popular WD40 type general purpose lubricant. As such Permagard lubricates, penetrates, disperses and replaces water, frees tight components, and forms a protective film over metal surfaces to protect them from the effects of oxidation. It is electrically insulating and ideal for automotive (for example, driving damp out of HT leads or use to prevent tracking between battery terminals due to condensation) and other electrical appliances which find themselves most used or stored out of doors. It is instrumental in recovering the reliability and smooth action of all types of switches. Supplied in 250gm aerosol can.



Order

YJ47B (Permagard) £1.95

Clear Mechanical Oil

A multi-purpose, light machine oil of very high quality and performance. Ideal for delicate mechanisms, yet is designed to meet high temperature and extreme pressure conditions. Contains non-staining Molybdenum Disulphide additives for long life, tenacity and exceptional anti-wear protection. Supplied in 250gm aerosol can.



Order

YJ44X (Aerosol Mech Oil) £2.40

Dry Film Lubricant

NEW

A special colourless dry lubricant (PTFE) with excellent anti-stick and mould release characteristics. Non-oily, extremely pure, chemically inert even at high temperatures and non-flammable. Does not affect plastics. Supplied in 300gm aerosol can.



Order

YM36P (Dry Film Lubricant) £2.95

Multi-Purpose Grease



A general purpose grease for use in many mechanical and electro-mechanical applications. It has a wide temperature range and good lubrication and thermal properties. Supplied in a tube of 50ml.

Order

FM80B (Tube of Grease) 68p

Anti-Sieze Paste



A corrosion inhibitor which, when applied, will help prevent the siezing of mechanical components due to progressive rusting or oxidation. The threads of screws, nuts and bolts are the most obvious candidates for such treatment. Supplied in a 2gm syringe.

Order

FM82D (Syringe Anti-Sieze) 38p

Potting Compound

Encapsulate your circuits to make them damage and moisture proof. Our potting compound packs are available in four different sizes to minimise wastage. Final mix is black. All resins get hot as they are curing, but where delicate electronic components are concerned, it can be a considerable advantage if the cure temperature is low and our compound does exhibit a comparatively low exothermicity. The resin and hardener are supplied in a single airtight pack with each part separated by a clip. When you wish to use the compound simply remove the clip and grip each end of the pack and pull *gently*. The compound may then be mixed in the bag which takes about 5 minutes. Full instructions are supplied with the pack. The compound remains workable for about 90 minutes, and is completely cured in 24 hours at 20°C. May be stored for at least 12 months without detriment. Has very high electrical resistance. Available in four sizes: 50g size makes 28.7cc, 100g size makes 57.5cc. 250g size makes 143.7cc, 500g size makes 287.4cc.

Order

FT17T (Potting Compnd 50g) £2.20
FT18U (Potting Compnd 100g) £2.80
FT19V (Potting Compnd 250g) £3.80
LQ02C (Potting Compnd 500g) £4.95

Flexible Rubber Sealant



A ready-to-use one part paste which when cured forms a tough flexible rubber seal. Adheres to most surfaces and has excellent electrical insulating and waterproofing properties. It is ideal for making watertight, electronic equipment used outdoors. Supplied in an 85gm tube.

Order

YJ91Y (Flex Rubber Sealant)..... £1.95

Plastic Gloves



A pair of light, throw-away plastic gloves for those especially messy jobs, or when handling chemicals. Ideal for protecting the hands whilst handling ferric chloride and PCB's in the process of being etched. Supplied in pairs.

Order

YJ48C (Plastic Gloves) 38p

ADHESIVES

Impact Adhesive



A general purpose adhesive having a high bond performance and which can be used on many difficult surfaces for those otherwise awkward gluing operations. Supplied in 50ml tube.

Order

FL43W (Impact Adhesive) 98p

Cyanoacrylate Adhesive



A one part adhesive which forms a very strong bond in a matter of seconds. This incredible material has the following features:

- ★ Reaches 90% of final bond strength within 10 minutes at room temperature.
- ★ Strength of bond is in most cases greater than the strength of the bonded material (i.e. under stress material will break before bond).
- ★ No jigs or clamps required, just light finger pressure.
- ★ Will bond a very wide variety of similar or dissimilar materials.
- ★ Single component — no mixing — and no shrinkage upon polymerisation.
- ★ Maximum strength achieved with glue thickness of 0.001in., therefore it is extremely economical.
- ★ Bond strength does not deteriorate under normal ambient conditions.
- ★ It is a transparent material and its refractive index is the same as some glasses (e.g. refractive index 1.49 — crown glass 1.517) so that glass can be joined and glue "disappears".

The adhesive is suitable for virtually all materials except polyethylene, polypropylene, Teflon (PTFE) and very porous surfaces. To use, ensure surfaces are free from oil or grease, preferably clean them with acetone (nail varnish remover) and with plastics, lightly roughen the surfaces. Pierce tube with a pin. Apply the adhesive to one surface only. Align surfaces then bring them together quickly applying light finger pressure. For very small bond areas spread glue by lightly rubbing components together once or twice, but once bond is established do not break it (adhesive cures in a few seconds depending on material, but in general do not handle for 10 minutes).

IMPORTANT NOTE. Do not allow adhesive to come into contact with the skin; we strongly recommend the use of polythene gloves when applying the adhesive. If contact with the skin does occur, wash immediately with water or acetone. If adhesive comes in contact with the eyes flush the affected eye immediately with large quantities of water and visit your doctor or a casualty department immediately.

KEEP AWAY FROM CHILDREN.

Supplied in 2gm tubes.

Order

FL46A (Cyanoacrylate) 80p

EPOXY ADHESIVES

Araldite Rapid



A quick setting version of the famous two part epoxy resin glue made by Araldite. Suitable for bonding almost all materials in common use; metals, wood, rubber, earthenware, glass and most plastics except polythene. Araldite sets with virtually no shrinkage and joints are resistant to chemical attack and provide a seal which is impervious to moisture, electrically insulating and a protection against electrolytic corrosion. Supplied in two 16gm tubes, one containing the resin and one the hardener. When cleaned, surfaces to be bonded should be roughened slightly. Mix equal amounts of resin and hardener and stir thoroughly for 30 seconds — the adhesive should be applied immediately but remains usable for about 5 minutes. A thin layer of adhesive is spread on each surface and then the two held firmly together for about 10 minutes. The adhesive sets in about 1/2 to 1 hour, but does not reach full strength for about 8 hours. The tubes are supplied in a pack with detailed instructions.

Order

FL44X (Araldite Rapid) £2.80

Thermal Bonding Compound

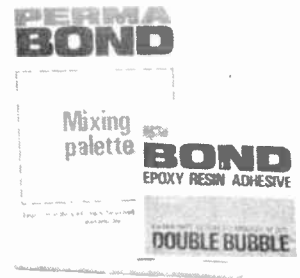


A metal-oxide loaded two part epoxy bonding system having excellent thermal conductivity while being electrically insulating. Ideal for bonding to heatsinks etc. Supplied in two syringes and applied in the ratio 3 parts of Part A (colour blue) to 1 part of Part B (colour cream). Contains 20ml total.

Order

FA81C (Thermalbond Compound)..... £17.95

Extra-Fast-Setting Adhesive



A two part epoxy resin adhesive that sets in 3 to 5 minutes. Supplied in a 3.5gm sachet simply cut off the end and squeeze out. Sachet contains exactly the correct proportional amounts of the resin and hardener to ensure a perfect mix. Stir the two parts together with stick (supplied) and apply immediately to both surfaces to be bonded then hold tightly together for a few minutes. Within one hour bond reaches a considerable strength, but is not completely cured for 24 hours. Can also be used as a filler.

Order

FL45Y (Double Bubble Sachet) 28p

PVC INSULATION TAPE



Strong, self-adhesive flame resistant PVC insulation tape. Width: 3/4in (19mm). Length: all colours including black: 4.6m reel. Alternative black only: 20m reel. Breakdown voltage: 7500V. Insulation resistance: 10¹⁴Ω/cm. Thickness: 0.15mm. VDE Approved. Available in Black, Blue, Green, Red, White and Yellow.

Order

FM84F (20m Black PVC Tape) 68p
FT20W (4.6m Black PVC Tape) 20p
FT21X (4.6m Blue PVC Tape) 20p
FT22Y (4.6m Green PVC Tape) 20p
FT23A (4.6m Red PVC Tape) 20p
FT24B (4.6m White PVC Tape) 20p
FT25C (4.6m Yellow PVC Tape) 20p



FAST SERVICE LOWEST PRICES

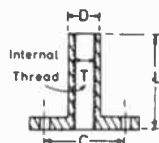
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COIL FORMERS Bakelite with Moulded Base



Two bakelite coil formers each having an integral mounting base. Smaller type has 8BA clear fixing holes, larger type has 6BA clear fixing holes. Iron dust core must be purchased separately if required.

Dimensions in mm.

Type	L	D	C	T	Suitable Core
351/8BA	21	7	20	6	Type 6
450	29	10	28	8	Type 8

Order

LB17T (Former 351)	35p
LB18U (Former 450)	35p

Bakelite



Four different length coil formers 4.8mm diameter may be fitted into our Former Base and screened with the appropriate screening can (see table). Iron dust core Type 4 fits all types.

Type	Length	Suitable Screening Can
722/1	14mm	No. 10
722/2	20.5mm	
722/8	27mm	No. 15
722/4	33mm	

Order

LB19V (Former 722/1)	20p
LB20W (Former 722/2)	20p
LB21X (Former 722/8)	20p
LB22Y (Former 722/4)	20p

Iron Dust Cores

Iron dust cores which are threaded and may be adjusted by our Trim TT5, (iron grade 500).



Type	Diameter	Length	Suits former
4	4mm	10mm	722
6	6mm	12.7mm	351/8BA
8	8mm	17mm	450

Order

LB41U (Dust Core Type 4)	18p
LB42V (Dust Core Type 6)	18p
LB43W (Dust Core Type 8)	28p

Base Plate



An SRBP base plate for use with our type 722 coil formers. Fitted with six pins. Overall size: 12.7mm square x 7mm high.

Order

LB44X (Former Base)	18p
---------------------	-----

Screening Cans



Two screening cans for use with our type 722 formers and Former Base.

Type	Width (square)	Length	Suits former
No. 10	12.7mm	17.5mm	722/1
No. 15	12.7mm	31mm	722/8

Order

LB36P (Screening Can 10)	15p
LB39N (Screening Can 15)	18p

ANTI-PARASITIC BEADS



Small ferrite beads which may be threaded on to wires to add impedance for the suppression of unwanted parasitic oscillations or to provide screening. Max. dia. 4.2mm. Max. length 5.5mm. Min. hole dia. 1.8mm. Packed in tens.

Order

LB62S (A/P Beads)	38p
-------------------	-----

NOTES ON WINDING INDUCTORS

The following range of pot cores allow inductances from about 10mH to 10H to be wound with a high degree of accuracy. In general it is best to use as thick enamelled copper wire as possible bearing in mind that the thicker the wire the fewer the number of turns that can be contained on the former within the core. Using thicker wire will have negligible effect on the value of inductance, but it will lower the DC resistance which makes the Q higher.

To calculate the number of turns required to make a particular inductance use the formula:

$$n = \sqrt{L/A_L} \text{ or } L = n^2 A_L$$

where n is the number of turns. L is the inductance in Henry's and A_L is the specific inductance.

The specific inductance of our cores is given in nanoHenry's and it is necessary to convert this to Henry's (i.e. $\times 10^{-9}$) to obtain the inductance in Henry's.

Example:

Using Core Type 2 find the number of turns required to give 0.1 Henry's (100mH).

For core LA4345, $A_L = 400\text{nH}$.

$$n = \sqrt{L/A_L} = \sqrt{0.1/400 \times 10^{-9}} \text{ turns}$$

$$= \sqrt{0.00025 \times 10^9} \text{ turns}$$

$$= \sqrt{250,000} \text{ turns}$$

$$= 500 \text{ turns.}$$

POT CORES Pot Core (Type 2) Core (Type 2) (LA4345)

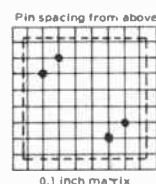


Pot core dia. 23mm, height 17mm. Printed circuit board mounting former (with pins on 0.1in. grid) and clips supplied separately. Specific inductance: 400nH.

Order

HX06G (Core Type 2)	£2.20
---------------------	-------

Bobbin (Type 2) (DT 2470)



Single section with four pins for use with Core Type 2.

Order

HX07H (Bobbin Type 2)	80p
-----------------------	-----

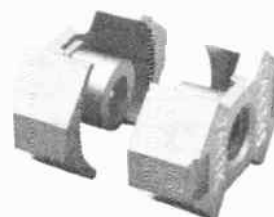
Clips (Type 2) (DT 2396)

Tinned sprung steel clips for use with Core Type 2 (2 clips required).

Order

HX08J (Clips Type 2)	6p
----------------------	----

Pot Core (Type 3) Core (Type 3) (LA4543)

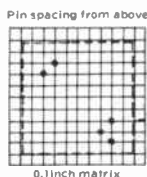


Pot core dia. 28mm, height 19mm, printed circuit board mounting former (with pins on 0.1in. grid) and clips supplied separately. Specific inductance: 1000nH.

Order

HX09K (Type 3 Core)	£1.80
---------------------	-------

Bobbin (Type 3) (DT 2534)



Single section with 5 pins for use with Type 3 Core.

Order

HX10L (Type 3 Bobbin) 80p

Clips (Type 3) (DT2406)

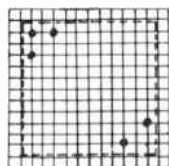
Tinned sprung steel clips for use with Type 3 Core (2 clips required).

Order

HX11M (Type 3 Clips) 6p

Large Pot Core (Type 4)

Core (Type 4) (FX2240)



Pot core dia. 26mm, height 16mm. Printed circuit board mounting (with pins on 0.1in grid). Bobbin and mounting system supplied separately. Specific inductance: 4300nH.

Order

HX12N (Large Pot Core) £1.40

Bobbin (Type 4)

Single section bobbin for use with large pot core.

Order

HX13P (Bobbin Type 4) 28p

Mounting System

Comprises four sprung steel clips, one chromed strain ring and one PCB mounting board with five pins.

Order

HX14Q (Mtg System Type 4) £1.28

Ready Wound Pot Cores



A range of ready wound inductors for use in equalisers etc. For details of core sizes see the individual pot core assembly types. The following types are available.

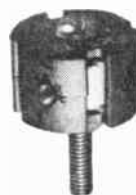
Type	Inductance	Wound in	DC Resistance
L15	10mH	Core Type 2	3Ω
L9	13mH	Core Type 2	5Ω
L14	40mH	Core Type 2	9Ω
L6	100mH	Core Type 2	15Ω
L12	350mH	Type 3 Core	15Ω
L11	1H	Type 3 Core	40Ω

Order

HW23A (GE Coil L15) £3.80
HX58N (GE Coil L9) £3.80
HW24B (GE Coil L14) £3.80
HX55K (GE Coil L6) £3.80
HW25C (GE Coil L12) £2.95
HW26D (GE Coil L11) £2.95

Small High Inductance Wound Cores

Three cores offering very high inductances in an extremely small core. Supplied with 1in 4BA fixing bolt through the centre and approx 100mm of wire ready for connection to circuit. Size: 18mm diameter; 11mm high.



Values available	Colour of leads	D.C. resistance
0.5H	Red/Brown	40Ω
1H	Orange/Yellow	55Ω
4H	Violet/White	110Ω

Order

HX24B (Choke 0.5H) £1.40
HX25C (Choke 1H) £1.40
HX27E (Choke 4H) £1.40

Filter (Mixer) Pot Core

A multi-tapped ready-wound pot core for use with our Filter Unit PCB (see page 243). When used on that board, the wires are connected to pins 1 to 5 as follows: 1-White, 2-Brown, 3-Red, 4-Green, 5-Violet.

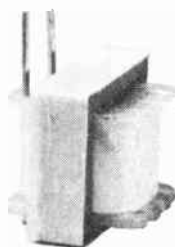
Order

LR07H (Filter Pot Core) £2.40

CHOKES

Very High Inductance Choke

A small audio choke inductance 10H (with no DC current present or 3H with 12mA DC). DC resistance: 750Ω. Size: 20 x 16 x 16mm.



Order

HW27E (Choke 10H) £2.40

Suppressor Choke For Car Radios



An in-line choke for use in conjunction with an in-line fuseholder (e.g. F/H Car) to help to suppress interference fed to the car radio from the 12V line.

Order

FQ91Y (Suppressor Choke) 80p

Open-Wound R.F. Chokes



Ferrite core high Q chokes. 16mm long. The following types are available.

Inductance	DC Resistance
1.5mH	7.5Ω
2.5mH	10Ω
5mH	14.5Ω
10mH	22Ω

Order

HX15R (Choke 1.5mH) 80p
HX16S (Choke 2.5mH) 80p
HX17T (Choke 5mH) 80p
HX19V (Choke 10mH) 80p

Moulded RF Coils

NEW



A range of small moulded coils with ferrite cores for designers. A special nylon trim tool is also available to suit these cores - a metal tool must not be used. The coils are available in 1½ to 8½ turn types and are particularly suited to use at frequencies between 40 and 170MHz.

Inductance in μH	Turns	Q at 100MHz	Colour code
0.04	1½	150	White
0.066	2½	150	Red
0.114	3½	150	Orange
0.180	4½	170	Yellow
0.230	5½	140	Green
0.297	6½	130	Blue
0.389	7½	140	Violet
0.450	8½	170	White

Order

UF62S (RF Coil 0.040uH) 68p
UF63T (RF Coil 0.066uH) 68p
UF64U (RF Coil 0.114uH) 68p
UF65V (RF Coil 0.180uH) 68p
UF66W (RF Coil 0.230uH) 68p
UF67X (RF Coil 0.297uH) 68p
UF68Y (RF Coil 0.389uH) 68p
UF69A (RF Coil 0.450uH) 68p
UF70M (RF Coil Trlm Tool) 24p

R.F. Chokes

A range of r.f. chokes having a triple barrier against moisture, & high termination strength & reliability.

Rating: ⅓W at 70°C
 Insulation resistance: >10⁹Ω



Value (μH)	Test freq. (MHz)	Self-resonant frequency	Q (min) at 20°C	D.C. resistance (max) at 70°C	D.C. current (max)
0.22	25	500	45	0.04Ω	2.4A
0.47	25	350	45	0.08Ω	1.7A
1.0	25	230	45	0.3Ω	880mA
1.5	7.9	190	30	0.6Ω	620mA
2.2	7.9	150	30	1Ω	480mA
3.3	7.9	120	30	1.7Ω	370mA
4.7	7.9	67	45	0.3Ω	880mA
6.8	7.9	57	45	0.6Ω	620mA
10.0	7.9	45	45	0.9Ω	520mA
15.0	2.5	38	55	1.6Ω	380mA
22.0	2.5	30	55	3Ω	280mA
33.0	2.5	25	55	5Ω	220mA
47.0	2.5	18	55	8Ω	170mA
100	2.5	10	50	11Ω	150mA
470	0.79	4.0	45	27Ω	94mA
1mH	0.79	2.7	45	40Ω	76mA

Order

WH25C (Choke 0.22uH) 48p
WH27E (Choke 0.47uH) 48p
WH29G (Choke 1.0uH) 48p
WH30H (Choke 1.5uH) 48p
WH31J (Choke 2.2uH) 48p
WH32K (Choke 3.3uH) 48p
WH33L (Choke 4.7uH) 48p
WH34M (Choke 6.8uH) 48p
WH35Q (Choke 10.0uH) 48p
WH36P (Choke 15.0uH) 48p
WH37S (Choke 22.0uH) 48p
WH38R (Choke 33.0uH) 48p
WH39N (Choke 47.0uH) 48p
WH41U (Choke 100uH) 48p
WH45Y (Choke 470uH) 48p
WH47B (Choke 1mH) 48p

HIGH FREQUENCY TRANSFORMERS

Shortwave Transistor Tuning Coils



A pair of tuning coils primarily for use with our 80 metre receiver project, and also transistor superhets and converters providing coverage in the range 1.67 to 5.3MHz (180 - 57 metres). The low loss polystyrene formers on which the coils are wound are colour coded as follows:—

Blue: aerial RF input with base input winding.
Red: local oscillator for 465kHz i.f.

The coils have threaded brass adjustable iron-dust cores and are supplied with a data sheet and packed in an aluminium container which may be modified and turned into a screening can.

Order

HX77J (Trans Coil 3T Blue) £1.98
HX78K (Trans Coil 3T Red) £1.98

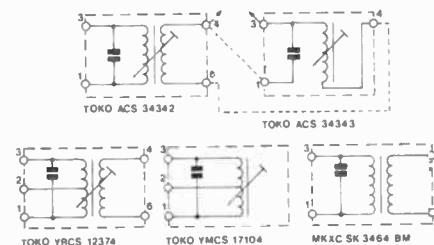
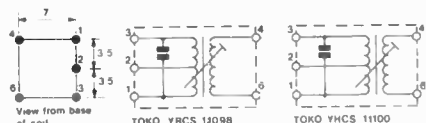
Sub-Miniature I.F. Transformers

Low-cost sub-miniature i.f. transformers. Overall size of screening can: 10mm square x 12mm high.



Specification

Type	YRCS11098	YRCS12374	YHCS11100	CSK3464
Q	90	90	140	100
Internal capacitor	180pF	180pF	180pF	27pF
Turns between pins				
1 & 2	140	127	104	
1 & 3	165	165	140	8
2 & 3	25	38	36	
3 & 4				
4 & 6	4	6	20	2
Application	1st i.f.	2nd i.f.	3rd i.f.	radio control
Nominal frequency	455kHz	455kHz	455kHz	27MHz
Range	455-470kHz	455-470kHz	455-470kHz	26-29MHz



Type	YMCS17104	ACS34342	ACS34343
Q	110	70	70
Internal capacitor	180pF	51pF	51pF
Turns between pins			
pins 1 & 2	98		
1 & 3	165	15	
2 & 3	67		
3 & 4			15½
4 & 6		1	
Application	i.f. osc.	FM i.f.	Series trap
Nominal freq.	455kHz	10.7MHz	10.7MHz
Range MHz	-455-470	9-11.4	9-11.4

Order

HX42V (Toko YRCS 11098) 54p
YG30H (Toko YRCS12374) 54p
HX43W (Toko YHCS 11100) 54p
YG31J (Toko CSK3464) 54p
YG32K (Toko YMCS17104) 54p
HX97F (Toko ACS 34342) 98p
HX98G (Toko ACS 34343) 88p

Miniature I.F. Transformers

A range of miniature I.F. transformers suitable for use in transistor radios and designed for printed circuit board or chassis mounting. All have adjustable tuning cores, and are supplied with drilling and connection details.

IFT13

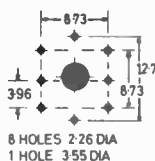


A miniature I.F. transformer, nominal frequency: 470 kHz. Size of aluminium screening can: 13.5mm square x 17.5mm high.

Order

LB00A (IFT 13) £1.95

IFT14



A miniature last I.F. transformer, nominal frequency: 470kHz. Size of aluminium screening can: 13.5mm square x 17.5mm high.

Order

LB01B (IFT 14) £1.95

IFT18

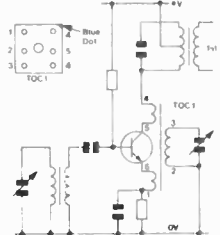
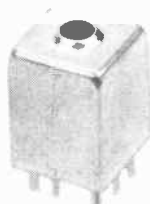


A double tuned transformer available for 465kHz I.F.'s. Size of aluminium screening can: 13.5mm square x 38mm high.

Order

LB05F (IFT 18) £2.36

TOC1



A miniature transistor medium wave oscillator coil which may be used with our Twin OO type tuning capacitor, or FM/AM Varitune. Has fitted adjustable dust core and screening can. Dimensions of can: 18.5 x 13 x 13mm.

Order

HX28F (Toc 1) £1.95

CALL IN TO YOUR LOCAL
Maplin SHOP
in MANCHESTER
8 Oxford Road. ☎061 236 0281

Coil for Mains Tx/Rx Project

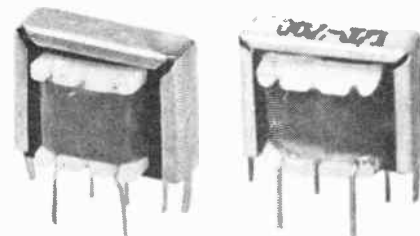
An oscillator coil for use with Mains Tx/Rx project.

Centre frequency	125kHz
Q (pins 3, 4) unloaded	25 min at 125kHz
Adjustment range (pins 3, 4) at 125kHz	33,000pF ±6%
External tuning cap	33,000pF
Winding pin 4 to 3	49½ turns
pin 5 to 6	7 turns
pin 5 to 2	3½ turns
pin 5 to 1	4½ turns

Order

FT55K (Tank Coil AO42YUK) 99p

AUDIO TRANSFORMERS



Two miniature transformers for audio matching. Dimensions 20 x 16 x 15mm. (CT = Centre tapped). Output type 200mW.

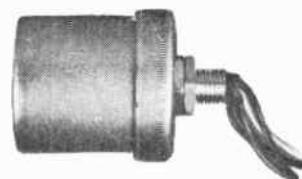
Type No.	Application	Primary impedance	Secondary impedance
LT44	Driver	20kΩ	1kΩCT
LT700	Output	1.2kΩCT	3.2Ω

Order

HX82D (Min Tr LT44) 58p
LB14Q (Min Tr LT700) 58p

Microphone Transformers

Type 2



The unit is designed to match low impedance balanced or unbalanced microphones into a high impedance input. The transformer is enclosed in a screened case to minimise hum pick-up. Fixing is by means of ¼in bush through which pass flexible connecting leads. Size: Height: 32mm; Diameter: 34mm. Input impedance 200 to 600Ω, output 50kΩ.

Order

LR06G (Mc Xfm Typ2 200-600R) £19.95

Type 3



An in-line impedance changer, having a high impedance output of 50KΩ and a low impedance input of 500Ω. Thus a low impedance microphone may be used with a high impedance amplifier input. The unit has an attractive spur aluminium barrel with standard ¼in mono jack socket in/out and ¼in mono jack plug output. Adaptors are available to suit other plugs/sockets, (see connectors section).

Order

YX84F (Z Changer) £5.95

Pulse Transformer

A pulse transformer designed for use with thyristors and triacs, but also suitable for slow speed pulse applications to provide isolation, and for wideband transformer applications. In this latter case the transformer has a very low insertion loss from 1kHz to 1MHz.

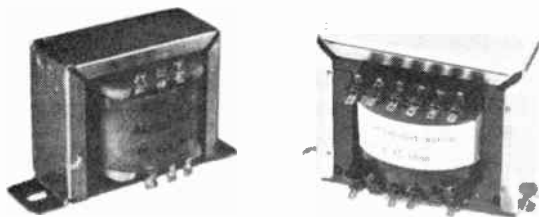
Turns ratio:	1:1
Input impedance:	50Ω
Output impedance:	50Ω
Interwinding proof voltage:	2.8kV (peak)
Interwinding working voltage:	440V rms
Minimum primary inductance:	3mH
Primary resistance:	1.1Ω
Secondary resistance:	0.9Ω
Capacitance:	20pF
Output voltage-time product:	200Vμsec.



Order

HX81C (Pulse Transformer) £3.80

100V Line Matching Transformers



A pair of impedance matching transformers for standard PA 100V line systems. Suitable for use with 4Ω, 8Ω and 16Ω speakers, in 15W and 30W versions.

Specifications:

	15W	30W
Primary:	1¼W, 2½W, 5W, 10W, 15W.	1W, 2W, 5W, 15W, 30W.
Secondary:	8Ω, 16Ω	4Ω, 8Ω, 16Ω
Overall size:	50 x 44 x 40mm	78 x 66 x 53mm
Fixing centres:	60mm	92mm

Order

YX66W (Line Trans 15W) £3.95
YJ60Q (Line Trans 30W) £7.95

600-600Ω Line Isolating Transformer

A very high quality 1:1 ratio isolating transformer for use on 600Ω systems. Very low insertion loss and excellent linearity over a wide signal level range coupled with a very high proof voltage make this transformer ideally suited for such applications as Viewdata, although other applications include telephony, general data transfer, audio and holding coil circuits. A key feature is its ability to maintain its signal performance whilst carrying up to 120mA d.c. in the primary (line) winding. Excellent isolation is achieved by use of two concentric nylon bobbins.



Safety: This transformer is designed to isolate mains-operated subscribers' apparatus from the Public Switched Telephone Network and is recognised by British Telecom for 'Prestel' terminals and adaptors under reference HED 25819. High (mains) voltages are prevented from reaching the line by the clamping action of the saturation voltage of the transformer. Persistent high voltage (current) on the 'subs' side will result in (safe) fusing of the winding. It is therefore recommended that a fuse be incorporated on the 'subs' side of the transformer. Typically a 250mA 'quick-blow' fuse would be suitable in most instances. Before any connection is made to the public switched telephone network, British Telecom authorisation should be sought.

Technical specification:

Primary resistance:	32Ω ±10%
Secondary resistance:	52Ω ±10%
Primary inductance (at 1V, 300Hz with 120mA DC):	350mH min.
Leakage inductance (referred to primary):	18mH typ.
Interwinding capacitance:	10pF typ.
Proof voltage (winding to winding and windings to core):	4kV r.m.s. (50Hz)
Insertion loss (0 to 120mA DC; -43 to +10dBm):	2dB, 300Hz to 3kHz
Saturation voltage:	75V

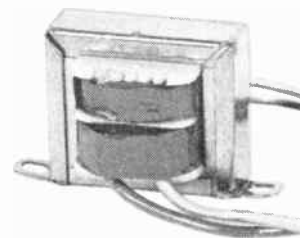
Order

BK57M (600 Ohm Isotran) £5.95

MAINS TRANSFORMERS

Sub-Miniature

A range of very small transformers that are wire ended. All types have 100mA output. Overall size: 37 x 31 x 30mm. Fixing centres: 45mm. All primaries tapped 0 to 240V.



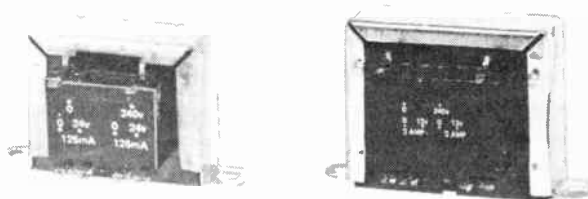
Type	Secondary
6V	6-0-6V
9V	9-0-9V
12V	12-0-12V

Order

WB00A (Sub-Min Tr 6V) £1.60
WB01B (Sub-Min Tr 9V) £1.60
WB02C (Sub-Min Tr 12V) £1.60

Miniature

A range of good quality mains transformers, all with primaries tapped: 0 to 240V. All types conform to BS415 and are therefore suitable for use in domestic appliances. They feature a split bobbin construction which eliminates the need for an interwinding screen.

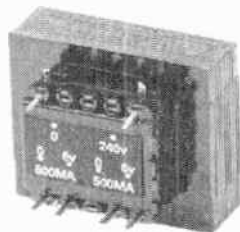
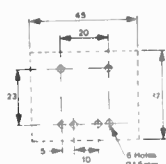


Type	Secondary	Max. current	VA	Overall size (wxdxh)	Fixing centres
6V Types					
6V	(1) 0-6V	500mA	6VA	46x36x33mm	54mm
	(2) 0-6V	500mA			
6V	(1) 0-6V	1A	12VA	60x50x45mm	71mm
	(2) 0-6V	1A			
6V	(1) 0-6V	2A	24VA	70x60x60mm	80mm
	(2) 0-6V	2A			
9V Type					
9V	(1) 0-9V	500mA	9VA	59x48x42mm	70mm
	(2) 0-9V	500mA			
12V Types					
12V	(1) 0-12V	250mA	6VA	45x40x43mm	54mm
	(2) 0-12V	250mA			
12V	(1) 0-12V	500mA	12VA	55x45x42mm	70mm
	(2) 0-12V	500mA			
12V	0-12V	1A	24VA	69x57x57mm	83mm
	0-12V	1A			
12V	0-12V	2A	48VA	78x66x53mm	92mm
	0-12V	2A			
15V Types					
15V	(1) 0-15V	200mA	6VA	45x40x35mm	54mm
	(2) 0-15V	200mA			
15V	(1) 0-15V	330mA	10VA	55x45x43mm	64mm
	(2) 0-15V	330mA			
20V Type					
20V	(1) 0-20V	150mA	6VA	45x40x35mm	54mm
	(2) 0-20V	150mA			
24V Type					
24V	(1) 0-24V	125mA	6VA	45x40x35mm	54mm
	(2) 0-24V	125mA			

Order

WB06G (Min Tr 6V) £3.20
YJ50E (Min Tr 0-6 0-6 1A) £4.20
YJ51F (Min Tr 0-6 0-6 2A) £5.80
WB11M (Min Tr 9V) £3.80
WB10L (Min Tr 12V) £3.80
YK28F (Tr 12V 0.5A) £4.20
WB25C (Tr 12V 1A) £4.40
WB26D (Tr 12V 2A) £6.95
LY03D (Tr 10VA 15V) £3.80
WB15R (Min Tr 15V) £2.95
WB16S (Min Tr 20V) £3.20
WB20W (Min Tr 24V) £2.95

Miniature PCB Mounting



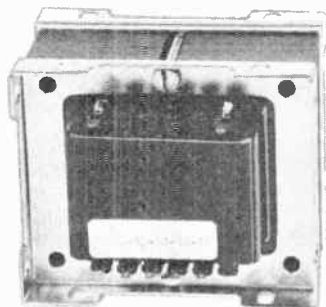
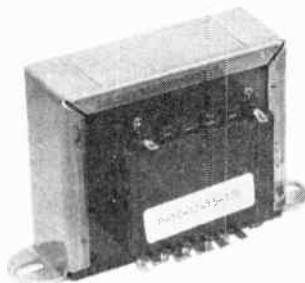
A range of compact PCB mounting transformers that are identical to the above miniature type mains transformers, but having PCB pins in place of solder tags. The pins require $\frac{1}{16}$ in dia. holes.

Type	Secondary	Max. current	VA	Overall size (wxdxl)	Pin spacing
6V	(1) 0-6V	0.5A	6VA	45x40x35mm	20x23mm
	(2) 0-6V	0.5A			
9V	(1) 0-9V	300mA	6VA	45x40x35mm	20x23mm
	(2) 0-9V	300mA			
12V	(1) 0-12V	250mA	6VA	45x40x35mm	20x23mm
	(2) 0-12V	250mA			
15V	(1) 0-15V	200mA	6VA	45x40x35mm	20x23mm
	(2) 0-15V	200mA			

Order

YJ52G (PCB Tr 0-6 0-6 0.5A)	£2.98
YJ53H (PCB Tr 0-9 0-9 0.3A)	£2.98
YJ54J (PCB Tr 0-12 x 2.25A)	£2.98
YJ55K (PCB Tr 0-15 x 2.05A)	£2.98

Multi-tapped Types



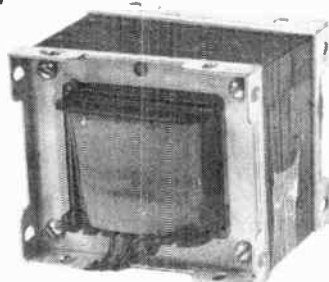
Type	Secondary	Max current	VA	Overall size (wxdxl)	Fixing centres
1A	0-10-12-15-17	1A	34VA	77x67x58mm	93mm
	0-10-12-15-17	1A			
HP*	0-10-12-15-17	2A	68VA	90x75x63mm	57 x 44mm
	0-10-12-15-17	2A			

*TR34VHP is a suitable replacement for TRMT3AT.

Order

WB07H (Tr 34V 1A)	£7.20
WB22Y (Tr 34V HP)	£9.95

Inverter Transformer

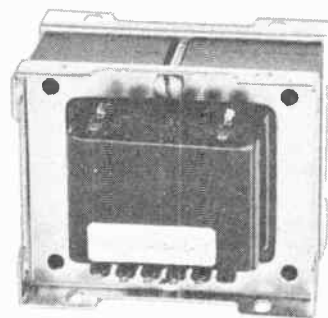
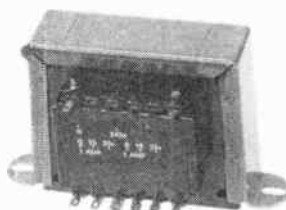


A transformer designed for use with our Inverter Kit, or other similar circuits. Designed to handle a maximum power of 100W. Not to be used "in reverse" as a mains transformer.

Order

XG29G (Inverter Transformer)	£22.95
------------------------------	--------

High Power Types



Type	Secondary	Max current	VA	Overall size (wxdxl)	Fixing centres
9V 1½A*	0-8-9V	1.5A	27VA	70x57x63mm	82mm
	0-8-9V	1.5A			
20V 1A†	0-15-20V	1A	40VA	80x65x58mm	57x44mm
	0-15-20V	1A			
28V 1½A‡	0-28V	1.5A	84VA	90x75x63mm	57x44mm
	0-28V	1.5A			
32V	32-0-32V	2A	128VA	98x84x65mm	64x54mm
32V	32-0-32V	4A	256VA	120x100x100mm	65x65mm
32032/6½A	32-0-32V	6.5A	450VA	118x99x127mm	90x65mm
	12-0-12V	1.5A			

*TR 9V 1½A is a suitable replacement for CT2

†TR 20V 1A is a suitable replacement for MT 206AT

‡TR 28V 1½A is a suitable replacement for Repanco 0722

Order

WB03D (Tr 9V 1.1/2A)	£5.80
WB12N (Tr 20V 1A)	£7.20
WB17T (Tr 28V 1.1/2A)	£9.40
YK02C (Tr 32-0-32 2A)	£12.40
YK07H (Tr 32-0-32 4A)	£19.95
XB38R (TR 32032/6.1/2A)	£25.65

Transformer Mounting Plate

A load spreading mounting plate for fixing TR 32032/6½ to wooden cabinets. A pair are required, one either side of the piece of wood with the transformer bolts clamping the "sandwich" together.

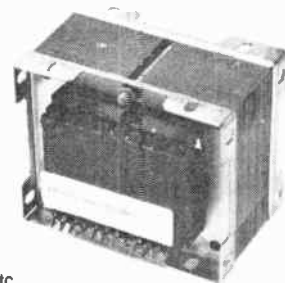


Order

HX59P (Transformer Mtg Plate)	80p
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Stereo Amplifier Transformer

A very high quality transformer designed primarily for use with our 40W Stereo Amplifier. The transformer has an electrostatic screen to keep hum fields to a minimum.



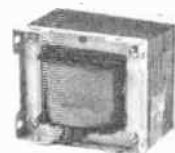
Primary:	110-0-110V
Secondary 1:	22-0-22V at 1½A
Secondary 2:	22-0-22V at 1½A
Secondary 3:	15-0-15V at 1A
Rating:	162VA
Size:	85 x 100 x 70mm
Fixing centres:	63 x 55mm
Style:	Similar to TR 20V 1A etc.

Order

LW34M (15/22V Power Tran)	£12.95
---------------------------	--------

Isolation Type

Primary:	240V
Secondary:	240V
Max current:	50mA
VA rating:	12VA
Overall size:	w:59mm, d:48mm, l:42mm
Fixing centres:	70mm



Order

LW33L (Tr 240V Isotran)	£3.80
-------------------------	-------

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

Auto Transformers

A range of auto-transformers which provide for adapting equipment with the American 120V mains voltage specification to British 240V mains, and vice-versa. Four different VA ratings are available to suit most examples of domestic equipment. In addition the 100VA type is available fully enclosed with a UK mains lead ready-connected and a standard 3-pin American mains socket so that 110/120V appliances can be directly plugged in.



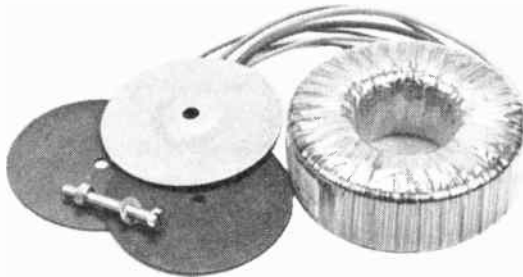
WARNING – These transformers are NOT isolating types, therefore although the output voltage may be different it is still very much connected to the mains supply and should be treated with the same respect as would be the mains supply proper.

Type	Tapped at	Dimensions	Fixing Centres
50VA	0-120-240V	58x63x70mm	44.5x58mm
100VA	0-120-240V	65x86x72mm	65x50mm
150VA	0-120-240V	73x95x89mm	57x51mm
250VA	0-120-240V	81x111x100mm	63.5x54mm

Order

YJ56L (Auto Tr 50VA)	£8.40
YJ57M (Auto Tr 100VA)	£13.40
YM50E (100VA US Mains Trans)	£14.95
YJ58N (Auto Tr 150VA)	£15.40
YJ59P (Auto Tr 250VA)	£19.95

Toroidal Transformers



A range of high quality toroidal transformers featuring low magnetic interference, small size and weight, low noise and excellent regulation. A mounting kit is supplied which allows easy mounting to a chassis by placing one neoprene washer below and one above the transformer and bolting the dished washer down on top. Note that an antisurge fuse should always be used as the mains fuse with toroidal transformers as they exhibit a very high initial surge current at switch on. All types have 240V primary and two separate identical secondaries colour coded: Secondary one start: Red; Secondary one finish: Yellow; Secondary two start: Blue; Secondary two finish: Grey. (Primaries are Orange).

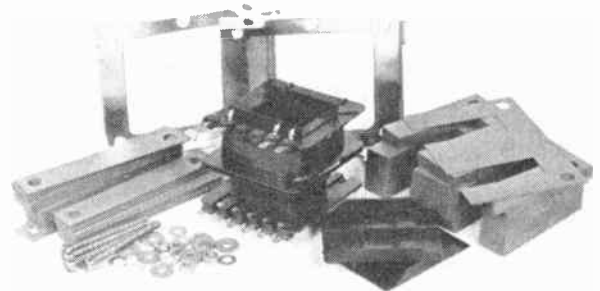
The following types are available:

Type	Size (mm) Dia x Ht	Secondary Voltage	Secondary Current	Order Code
30VA 6V	70 x 30	0-6, 0-6	2.5A	YK08J
30VA 9V	70 x 30	0-9, 0-9	1.66A	YK09K
30VA 12V	70 x 30	0-12, 0-12	1.25A	YK10L
30VA 15V	70 x 30	0-15, 0-15	1A	YK11M
30VA 18V	70 x 30	0-18, 0-18	830mA	YK12N
50VA 9V	80 x 35	0-9, 0-9	2.77A	YK14Q
50VA 12V	80 x 35	0-12, 0-12	2.08A	YK15R
50VA 15V	80 x 35	0-15, 0-15	1.66A	YK16S
80VA 18V	90 x 30	0-18, 0-18	2.22A	YK17T
80VA 22V	90 x 30	0-22, 0-22	1.81A	YK18U
80VA 30V	90 x 30	0-30, 0-30	1.33A	YK19V
120VA 24V	90 x 40	0-24, 0-24	1A	YK86T
120VA 30V	90 x 40	0-30, 0-30	2A	YK20W
120VA 100V	90 x 40	0-24, 0-24, 0-100	2.5A	YK33L
160VA 35V	110 x 40	0-35, 0-35	2.28A	YK21X
300VA 35V	110 x 50	0-35, 0-35	4.28A	YK22Y
300VA 45V	110 x 50	0-45, 0-45	3.33A	YM45Y
500VA 35V	140 x 50	0-35, 0-35	7.14A	YK23A
500VA 45V	140 x 50	0-45, 0-45	5.55A	YM46A
500VA 55V	140 x 50	0-55, 0-55	4.5A	YM47B
625VA 45V	145 x 55	0-45, 0-45	6.9A	YM48C
625VA 55V	145 x 55	0-55, 0-55	5.6A	YM49D

Order

YK08J (Toroidal 30VA 6V)	£8.95
YK09K (Toroidal 30VA 9V)	£8.95
YK10L (Toroidal 30VA 12V)	£8.95
YK11M (Toroidal 30VA 15V)	£8.95
YK12N (Toroidal 30VA 18V)	£8.95
YK14Q (Toroidal 50VA 9V)	£9.95
YK15R (Toroidal 50VA 12V)	£9.95
YK16S (Toroidal 50VA 15V)	£9.95
YK17T (Toroidal 80VA 18V)	£10.95
YK18U (Toroidal 80VA 22V)	£10.95
YK19V (Toroidal 80VA 30V)	£10.95
YK86T (Toroidal 24V/24V)	£12.95
YK20W (Toroidal 120VA 30V)	£12.50
YK33L (Toroidal 24/100V)	£14.95
YK21X (Toroidal 160VA 35V)	£12.95
YK22Y (Toroidal 300VA 35V)	£18.50
YM45Y (Toroidal 300VA 45V)	£18.50
YK23A (Toroidal 500VA 35V)	£24.95
YM46A (Toroidal 500VA 45V)	£24.95
YM47B (Toroidal 500VA 55V)	£24.95
YM48C (Toroidal 625VA 45V)	£29.95
YM49D (Toroidal 625VA 55V)	£29.95

TRANSFORMER KITS



At last you can wind your own mains transformers to your specification. Some power supply requirements might include an unusual secondary winding, which can be easily catered for by building a transformer kit, thereby obviating the tedious process of searching through the catalogues and adverts for a transformer to meet your needs, and having to settle for one having a higher specification or additional secondary taps which are expensive and which you don't really want. As an example, a digital frequency counter using a fluorescent multi-digit display will require +5V for its logic circuits, and then a 3 volts AC heater feed for the display. Or you may want a +5V, +12V and -5V supply for your home made microprocessor system, plus an additional 25V tap for programming EPROMS. The only other recourse would be to use two separate transformers, which use up space and money.

20VA Transformer Kit

This 20VA transformer kit comprises a double section bobbin ready wound with a 120-240V mains primary winding, electrical steel core 'E' and 'I' laminations, end mounting 'frames' and clamping bolts. The number of secondary turns required can be found by multiplying the required secondary output in volts by 3.7. The maximum current output depends on the wire cross section of the secondary winding (see table below). The total power output of all secondaries must not exceed 20VA. Enamelled copper wire for winding the secondaries is not supplied with the kit.

Dimensions: Width 69mm x Depth 55mm x Height 58mm.
Weight: 660 gms.

Order

YJ61R (Transformer Kit 20VA)	£6.75
------------------------------	-------

50VA Transformer Kit

A transformer kit having a ready wound 120-240V mains primary winding, 'E' and 'I' laminations and end frames. Secondary windings can be wound for a total output not exceeding 50VA. The number of secondary turns required can be found by multiplying the voltage output required by 4.9. To find wire gauge for current output required see table below. Wire for winding the secondaries is not supplied in the kit.

Dimensions: Width 79mm x Depth 62mm x Height 65mm.
Weight: 950 gms.

Order

YJ62S (Transformer Kit 50VA)	£9.45
------------------------------	-------

100VA Transformer Kit

A transformer kit having a ready wound 120-240V mains primary winding, 'E' and 'I' laminations, end frames and clamping bolts. Secondary windings can be wound using enamelled copper wire for a total power output not exceeding 100VA. To find the number of secondary turns required multiply output voltage required by 6.4. To find wire gauge for the output current required see table below. Wire for winding the secondaries is not supplied in the kit.

Dimensions: Width 89mm x Depth 68mm x Height 75mm.
Weight: 1400g.

Order

YJ63T (Transformer Kit 100VA) **£11.95**

NOTE: Under no circumstances should you attempt to modify or rewind the mains primary winding if the transformer is to remain safe to use. The primary windings have been properly assembled and tested during manufacture and should not be interfered with.

Output Current Calculation Table

Wire Gauge s.w.g	Wire Dia. mm.	Max Current Out	Max number of turns for -		
			20VA	50VA	100VA
36	0.2	100mA	1664	2394	3300
34	0.224	150mA	1363	1938	2652
32	0.25	200mA	1092	1581	2135
30	0.315	300mA	714	1025	1421
26	0.4	500mA	459	660	897
24	0.56	1A	228	336	476
22	0.71	1.5A	150	209	286
21	0.8	2A	104	160	240
20	1.0	3A	77	104	144
18	1.25	5A	40	60	96
16	1.5	7.5A	28	40	60

Note that the total number of turns that can be accommodated on the former are reduced in proportion to increasing output current, and therefore, increasing wire sizes. Ergo, you will not be able to achieve a high current high voltage output from a transformer kit that is too small. This is a limiting factor on the maximum output power available in a physical sense, in addition to the power transfer capability as defined by the transformer's electro-magnetic characteristics.

NEVER attempt to use tinned copper wire in place of enamelled copper wire, regardless of how small the winding.

FERROXCUBE H.F. FERRITE TRANSFORMER KITS



These ferrite cored high power transformer kits form a useful addition to complement our range of pot cores. The Ferroxcube system can provide for those applications where even the largest pot core is not powerful enough. Ideal for such requirements as voltage inversion, step-up or step-down, power oscillators, compact, light-weight yet powerful supply regulators, or switch mode regulated power supply systems. They operate on the principle that a reduction in physical bulk and weight can be simply achieved by using a frequency substantially greater than the 50Hz mains, although of course a suitable push-pull driver circuit must be used to drive the primary side at the optimum operating frequency of, in this case, 25kHz.

Two kits are available in 50 or 100 watt versions. Each kit comprises two 'E' shaped halves of the ferrite core, a high temperature, moulded maranyl core former, and 16 winding termination solder tags which can be inserted into the former as required. The assembled transformer is very compact, for example the 100W version does not exceed 40mm in any dimension.

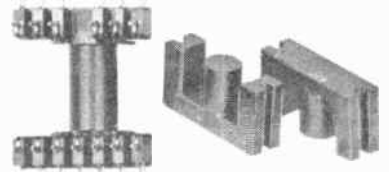
The ferrite core is provided with outer grooves to accept long 6BA bolts or studs to hold the two halves together when assembled. These fixings must be of brass or similarly non ferrous material, and it is recommended that top and bottom clamping plates be made on which the nuts of the studding should act to provide an even overall pressure.

Specification	50W kit	100W kit
Absolute maximum power through-put, push-pull driven @ 25kHz -	75W	150W
Effective total core loss @ 25kHz -	1.1W	2.2W
Ambient operating temperature -	60°C	60°C
Maximum operating temperature -	100°C	100°C
Total ferrite volume -	7780mm ³	12600mm ³
Total centre pole volume -	1740mm ³	2950mm ³
Maximum permissible core centre pole flux density before saturation @ 100°C -	320mT	320mT
Most stringent example of 5V output -	5V @ 10A	5V @ 20A
Recommended core clamping force -	≈20kgf	≈25kgf

An output power less than the maximum can be achieved by progressively reducing the input switching frequency below the optimum, or by shortening the 'on' time of the switching waveform.

50W Kit

Dimensions assembled - 35.5mm wide x 33mm deep x 40mm high.
Weight - 45gms. Overall dimensions assembled include clamps, studs and nuts. (Clamps/brackets must be provided by the user.)

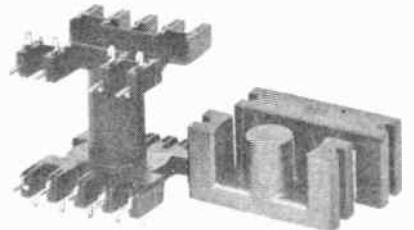


Order

FT32K (50W Ferrite Tran Kit) **£4.75**

100W Kit

Dimensions assembled - 41.6mm wide x 37.4mm deep x 47mm high. Weight - 70gms. Overall dimensions assembled include clamps, studs and nuts. (Clamps/brackets must be provided by the user.)



Order

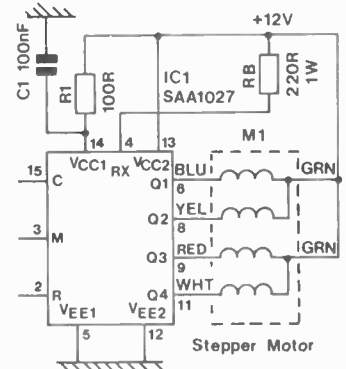
FT33L (100W Ferrite Tran Kit) **£5.75**

MOTORS AND SERVOS



Stepper Motor

A 12V 4-phase, unipolar stepping motor suitable for small robots and all kinds of applications requiring medium torque at low current drains. A suitable driver is the SAA1027 and a kit is available which contains the motor, the IC and the passive components required.



Specifications:

Step angle:	7.5°
Current per phase:	130mA
Resistance per phase:	94Ω
Inductance per phase:	43mH
Dynamic torque, @ 10pps:	80gm/cm (8mNm)
Response frequency:	300pps
Rotor inertia:	4gm/cm ²
Weight:	57gm
Dimensions:	35 dia. x 25mm deep.
Drive Shaft:	3mm dia x 11mm long
Max width across mounting tabs:	50mm.
Fixing centres:	42mm x 6BA/M3.

The motor is provided with six wires 230mm long, colour coded White, Orange, Brown, Black, Red, White.

Order

FT73Q (Stepper Motor Size 1) **£9.95**

Stepper Motor Kit



A kit comprising the Stepper Motor FT73Q, SAA1027 stepper motor driver IC (see page 352), and all passive components required to make a working module, but not including a PCB.

Order

LK76H (Steppr Mtr + Drvr Kit) **£12.95**

Small Motor

A small 20mm diameter motor with a 2mm dia shaft. Overall length: 30mm excluding shaft. Shaft length: 7.5mm. The motor casing is flattened for easy mounting. Distance across flats 15mm.

Operating voltage: 1.5 to 3V
 No load speed: 8700rpm
 No load current: 320mA
 Speed at max efficiency: 5800 rpm
 Current at max efficiency: 760mA
 Torque at max efficiency: 5.3gm cm
 Output at max efficiency: 310mW
 Efficiency: 32%
 Stall torque: 16gm cm



Order

YG13P (Small Motor) £98p

Miniature Motor

A miniature 16mm diameter motor with a 1.5mm dia shaft. The motor is secured by two metric screws (not supplied, use BF41U). The screws MUST NOT exceed a depth of 2mm into the motor, or the armature will be fouled. The two tapped holes for the screw fixing are to be found at either side of the output shaft.

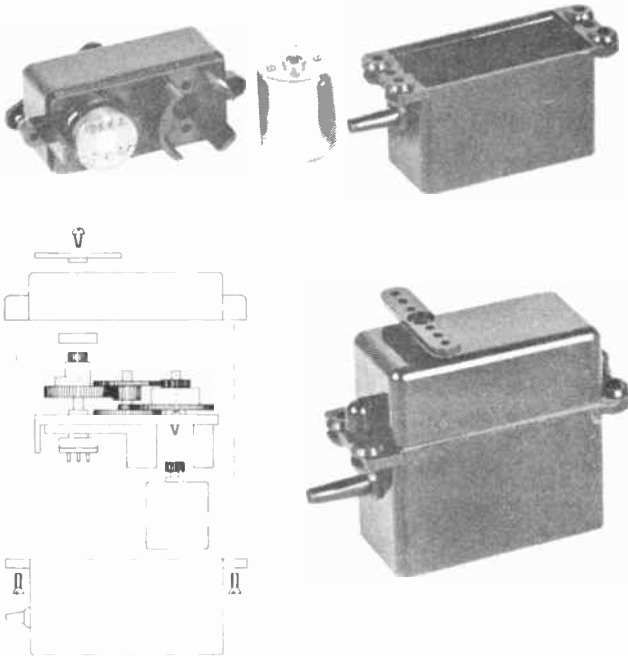
Overall length: 25.5mm excluding shaft. Shaft length: 2mm. Operating voltage: 1.5 to 3V. No load speed: 12,500 rpm. No load current: 65mA. Typical load current: 170mA.



Order

YG12N (Min Motor) £3.95

Servo Mechanism



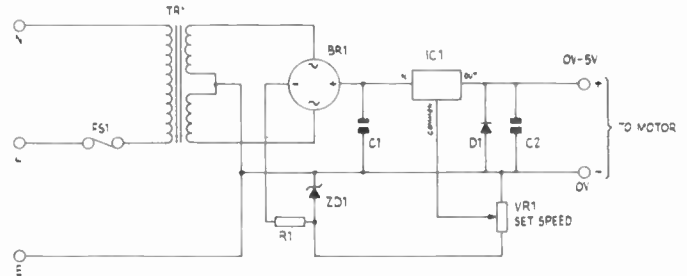
A servo mechanism supplied in kit form, complete with self contained 5k Ω potentiometer, with end stops on the output shaft. Standard four corner mounting, with four PVC grommets included for insertion into the mounting holes to provide for some insulation against shock and vibration. A PVC cable strain relief is included for wires leaving the servo case. The servo uses the miniature motor YG12N which is retained in position with two screws, and is supplied as part of the mechanism. The servo is provided with a single cross-T output actuating arm. Overall size: 39mm x 39mm x 19mm. Fixing centres: 46 x 11mm x 6BA. Weight: 30 grams with motor.

Order

YG14Q (Servo Mechanism) £7.95

0V To 5V Constant Voltage Regulator

This neat little circuit is designed to drive most small motors up to 5V including those described here. The circuit is adjustable from 0 to 5V to set the speed of the motor. Once the speed is set, the voltage and hence the speed will not change regardless of the load. If the load increases, the current will increase too, up to a maximum of 1A, when the IC starts to limit the current. The IC must be mounted on a heatsink (eg. Heatsink 4Y) using a Kit (P) Plas and Thermpath.



Parts List

- R1 Min Res 1k
- VR1 Pot Lin 1k
- C1 Disc 0.1 μ F
- C2 Disc 0.1 μ F
- D1 1N4001
- BR1 Bridge W005
- ZD1 BZY88C5V1
- TR1 Min Tr 9V
- IC1 μ A7805UC
- FS1 Fuse 20mm 0.5A

Also required:

Safuseholder 20, Heatsink 4Y, Kit (P) Plas, Thermpath. Wire, nuts and bolts, knob, box etc. to suit your requirements.

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 GOVT. DEPT's, IF YOU
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 TELEPHONE 0702 552961. TELEX 995695.**

MISCELLANEOUS

Flow Sensor 440
Hearing Aid 439

IDC Cables 440
Speedometer Sensor 440

UHF Modulators 440
Windscreen Wiper Controller 439

DIGITAL THERMOMETER

Comparison with a standard mercury clinical thermometer

	Mercury thermometer	Maplin digital thermometer
Preparation	Shake down mercury	Switch on
Weight	4 to 10 grammes	6 to 7 grammes
Length	Most are 11 to 12cm or more	11cm
Accuracy	Depends on positioning of scale or how accurately glass is marked	±0.4°F over normal range
Reading completed	After about 1 minute, but no way of knowing if top temperature has actually been reached	After about 1 minute when correct temperature reached, display stops flashing
Taking reading	Mercury often hard to see and scale difficult to interpret	As easy to read as a digital watch
Finish	Shake down mercury	Switch off. Automatically switches off after 8 minutes if you should forget
Cleaning	Dip in luke-warm soapy water	Dip tip in luke-warm soapy water
Sterilising	Dip in Milton or medical alcohol	Dip tip in Milton or medical alcohol
Price	About £1.20 to £2.00, but can you be sure it's accurate and can you be sure you've read it correctly?	Less than £7 for accuracy, reliability and peace of mind!

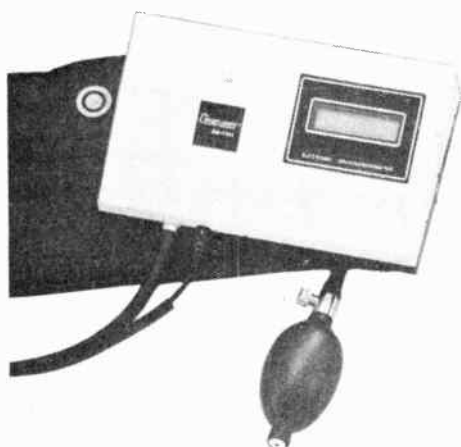


A clinical thermometer having a digital LCD readout display. The thermometer will measure temperature in the range 89.6°F to 107.6°F. This is the biomedical temperature range, and the thermometer is accurate only within this range. If the measured temperature is outside of this range then the display will only read as 'L' or 'H' (for Low or High as appropriate). The display 'blinks' at a rate of 1Hz. There is also a peak hold function, where the peak value measured is held and displayed until power is turned off. If the thermometer is inadvertently left on, it will turn itself off after about 7 minutes. Instructions are also supplied. Size 137mm long x 16mm wide x 7mm thick. Weight 13 grams. Uses silver oxide type battery SR41W etc.

Order

FK51F (Digital Thermometer) £6.95

BLOOD PRESSURE TESTER



An electronic blood pressure meter that will allow you to measure your own blood pressure at home. The LCD readout will display the systolic and diastolic pressures and pulse rate. A good quality cuff is

provided which has a microphone fitted in it. The cuff has a Velcro seal which permits it to be fitted with one hand, so that it is easy for you to take your own blood pressure. To use the meter, you must first locate the pulse in your upper arm created by the brachial artery. The cuff is then prepared as described in the instructions supplied with the unit and the microphone in the cuff placed directly over the pulse. The inflation bulb may then be pumped until the pressure reading on the meter is at least 30mm Hg over your normal systolic pressure (say 200mm). The pressure will now reduce automatically. After a time the red light will flash and a beeping sound will begin, which indicates that the display is now showing your systolic pressure. Shortly after this a second number will be displayed which is the diastolic pressure. After a further delay your pulse rate will be shown.

It is vital that before you start to use this equipment, you obtain your true blood pressure reading from your Doctor. You may then use this device regularly and report back to your Doctor when the readings alter significantly from your Doctor's original measurement. In all cases take your Doctor's advice on how to use the equipment and only use it as a guide to changes from a reading taken by a professional person.

Specification

Measurement method	Riva Rocci
Indicators	LCD, Flashing lamp, Buzzer
Range	20 to 300mm Hg blood pressure 30 to 300 per minute pulse rate
Accuracy	±3mm blood pressure ±3% pulse rate
Microphone	Piezo ceramic type
Air inflation	Manual by rubber bulb
Air deflation	Automatic air release valve
Battery life	Over 7 hours continuous
Size	180 x 107 x 53mm
Weight	350g

Supplied with everything you need including instructions and four HP7 batteries

Order

XG60Q (Blood Press Tester) £79.95

HEARING AID



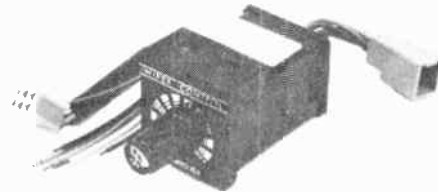
A hearing aid for the hard of hearing. It is not suitable for people whose deafness is caused by illness, but it is ideal for those whose hearing difficulty is simply due to their age. The compact lightweight amplifier unit requires two AA size batteries (supplied). An inner ear type earpiece lies snugly in the ear and is very unobtrusive and comfortable to wear even for long periods. The unit has a tone control switch and a volume control. A plastic clip on the rear of the unit allows it to be clipped into a pocket. Although the unit contains its own electret condenser microphone, there is a socket where an external microphone can be plugged in. The hearing aid produces a very crisp, clear sound and can make a dramatic improvement for the hard of hearing.

Battery	2 x AA cell
Frequency response	250Hz to 4.5kHz
Audio gain	44dB
Harmonic distortion	4%
Battery life	150 hours
Size	84 x 61 x 22mm
Weight (excl. batteries)	39g

Order

FA84F (Hearing Aid) £19.95

WINDSCREEN WIPER/WASHER CONTROLLER



Easily fitted on any 12V self-parking wiper system, the unit allows the wipers to operate intermittently without manual intervention. Delay between wipes may be adjusted for any period between approximately 2 and 20 seconds. In addition the unit includes the facility to operate the wipers when an electric windscreen washer is activated, even if the control knob of the unit is in the 'off' position, and only the washer switch is pressed. This action makes simultaneous operation of the wiper switch's 'intermittent' position, after a 'wash', unnecessary since this is now automatic. The controller will usually activate the wipers for two wipes, or more depending on how long the washer switch is held down. This automatic wash/wipe function can be used by connecting the green wire directly to the washer pump switch if the latter goes negative when on - if the pump goes positive when on, then a relay must be connected across the pump motor and arranged to switch the green wire to -V. Can be fitted to positive or negative earth cars.

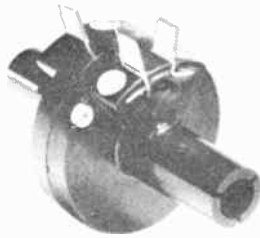
Order

HQ30H (Wiper Control) £11.95

All prices include VAT Price charged will be that current on the day of despatch. See prices on page 15.

SPEEDOMETER CABLE SENSOR

A small plastic sensor that fixes to the speedometer cable, by which the rotational speed can be measured as the unit provides a pulsed output. The unit is fixed to the cable as follows. Release the cable from the back of the speedometer, cut the outer sheath at a place where there is room to fit the sensor, and draw the sheath off the cable. Wipe the cable clean of grease, chamfer the end of the cable and push it through the sensor until the sheath is pulled tightly into the unit, then clamp it with a Jubilee clip. If the cable is too thin, then wrap tape around it to build up the diameter to fit. Cut 13mm (½in.) off the piece of removed sheath and slide it back on to the cable pushing it into the sensor, and clamp it with a Jubilee clip. Finally refix the cable to the speedometer.



The unit requires a +5V DC supply at 20mA (max) (bypass with a 0.1µF capacitor) and the output, which requires a 10k resistor to +5V is a series of 5V pulses at the rate of 10 per revolution. Three ½in. tags are provided, marked red for +5V, silver for earth and blue for output. The tags fit our Push-On Receptacles.

Specification

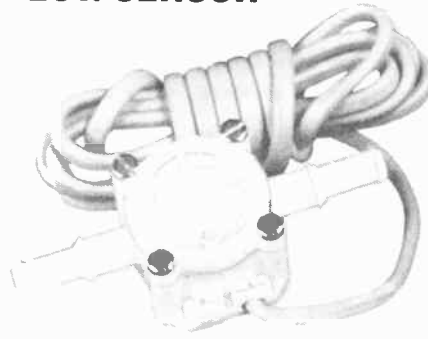
Speedometer cable core diameter:	2.5 to 3.1mm.
Cable sheath outside diameter:	9.1mm (max)
Rotation:	either direction
Range:	1 to 20,000 rpm
Operating voltage:	+5V DC (V _{CC})
Output high:	V _{CC}
Output low:	0.1V (0.25V max)
Frequency:	10 pulses per rev
Rise time:	0.2ms
Overall dimension:	76mm long, 42mm dia
Outside diameter of clamping collets:	13mm

When used in conjunction with the Flow Sensor a direct reading miles per gallon meter can be made.

Order

YX85G (Speed Sensor)	£19.95
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FLOW SENSOR



A flow sensor moulded in acetal and designed primarily to measure flow in the petrol supply pipe in cars, but finding applications in many other areas. To install, simply cut the fuel line between the fuel pump and the carburettor, but before any pressure regulator, and push the sides of the pipe onto the sensor and clamp with Jubilee clips. Avoid fitting the sensor in places that get hot and if possible, fix the sensor vertically. The unit requires a +5V DC supply at 20mA and the output, which requires a 1k resistor to +5V, is a series of 5V pulses with a maximum frequency of around 60Hz. Supplied with 1.75m of twin core screened cable. Red is +5V DC, blue is the output and the screen is earth.

Specification

Hose diameter:	4 to 8mm inside
Flow range:	0.3 to 22 gallons per hour 1.5 to 100 litres per hour
Viscosity:	0.8 to 10cST
Pressure drop:	0.1 bar at 30 litres per hour
Design pressure rating:	10 bar
Frequency:	20 Hz at 2 gallons per hour 40 Hz at 3.75 galls per hour 60 Hz at 5.5 galls per hour
Operating voltage:	4.5V to 24V DC (V _{CC})
Output high:	V _{CC}
Output low:	0.1V
Overall dimensions:	78 x 32 x 27mm.

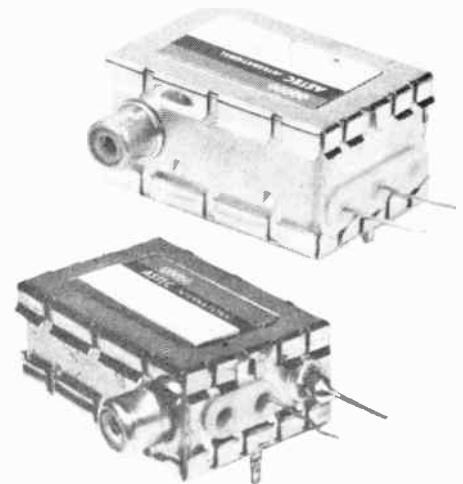
When used in conjunction with the Speed Sensor a direct reading miles per gallon meter can be made.

Order

YX86T (Flow Sensor)	£19.95
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UHF MODULATORS

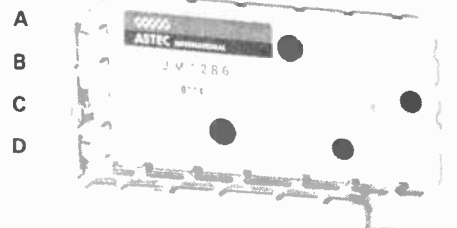
From composite video, these modulators produce an RF output suitable for connection to the aerial input of a standard UK UHF TV set. The output is preset to approximately channel 36. Type UM1111 is a straightforward black and white only modulator, type



UM1233 has the chroma sub-carrier for full colour displays and the UM1286 includes the chroma and sound sub-carriers for full colour with sound. The output on all modules is via a phono socket.

Specification

	UM1111	UM1233	UM1286
Supply Voltage	6.5V	5V	5V
Supply Current	1mA	6mA	9mA
Bandwidth	2MHz	8MHz	8MHz
Sound Sub-carrier	—	—	6MHz
Size (mm)	43x30x23	43x30x18.5	71x37x20



With labelled side facing you and phono socket pointing downwards, the lead connections are as follows:

	UM1111	UM1233	UM1286
A	None	Supply +V	Fine tune
B	None	Video input	Audio input
C	Supply +V	None	Supply +V
D	Video input	None	Video input

The case must be connected to ground.

Order

XX05F (UHF Modulator UM1111)	£3.40
FT30H (UHF Modulator UM1233)	£5.80
BK66W (UM1286 Modulator)	£14.95

LET US MAKE IDC LEADS TO YOUR SPECIFICATION

The Low-Cost Way To Get Precisely The Cable You Want

Now you can get exactly the connector you need, exactly the length you want and at a remarkably low cost. Choose from any of the 0.05in. IDC connectors on pages 124, 125 of this catalogue and one of the IDC cables shown on page 76. Your cable can have a connector on one end or both ends and even 'daisy chains' are possible. You simply tell us the exact length of cable you need, from extreme tips of the connectors. The cable can be the Flat IDC Cable or the Colour Coded IDC cable.

Very Low Prices

You will be charged for the connectors at the normal current price and for the cable you will be charged per 3cm to the next 3cm above what you have ordered. And each 3cm will be priced at 1/10 the current price for 30cm of that cable. The only extra charge is just £1 for making the cable specially for you (plus 50p per connector if over two connectors are to be fitted on the one cable). Each connection on every cable we make for you is electronically tested to ensure that you receive a perfect cable every time!

You Must Use The Special Order Form

Send now for our free order form XH64U which shows pin layouts for each type of connector and must be used to order your special cables. A replacement order form will be returned with your cable.

Order Your Cable In Our Shops

You may order your cable in any of our shops and orders received by the end of Friday of one week will be ready for collection on Friday of the following week.

ORDER CODE CROSS-REFERENCE INDEX

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AC55	109	BH62-63	212	BR17	213	FA42-54	125	FH34	394	FK52-53	416	FQ39-41	278	FV70	41	GA25	230
AC61	109	BH65-66	123	BR21-38	213	FA55-59	221	FH35	396	FK54-71	39	FQ62	282	FV71-76	121	GA26-27	235
AC67	108	BK04	203	BR41-42	214	FA60-64	220	FH36	397	FK72-74	66	FQ63-66	283	FV77-86	125	GA28	251
AC80	108	BK06	34	BR46-47	213	FA65	418	FH37	401	FK75-76	275	FQ91	432	FV87-88	121	GA29	250
AC83	108	BK25-26	72	BR48-51	415	FA66	420	FH38	397	FK77	274	FR01-2	424	FV89	118	GA30-31	245
AC92	109	BK27-28	282	BR52-53	416	FA67-68	421	FH39	393	FK78-79	275	FR03-8	426	FV90	133	GA32	254
AC96	109	BK29	72	BR58	415	FA69	424	FH40	396	FK80	385	FR10	427	FV91-92	121	GA35	255
AF10	97	BK30	389	BR59-62	422	FA70-73	393	FH41	397	FK81-84	384	FR11-15	425	FV93	133	GA36	254
AF27	194	BK31	398	BR63-64	421	FA74-77	404	FH42-45	395	FK85	398	FR16-18	426	FV94-96	131	GA40	236
AF33	391	BK32-33	394	BR65-66	423	FA78-80	398	FH46-48	396	FK87	398	FR20	425	FV97	132	GA41	251
AF60	193	BK34	415	BR67-68	213	FA81	430	FH50-53	396	FK89	398	FR21	428	FV98	138	GA42	253
AF90	101	BK35-36	416	BR71-72	417	FA82-83	420	FH55	396	FK91	398	FR22	415	FW00-9	290	GA43	244
AF98	195	BK37-38	417	BR73	418	FA84	439	FH57	395	FK93-94	398	FR23-24	427	FW10-11	142	GA44-47	224
B—	286	BK39-40	427	BR74-75	417	FB01-3	91	FH59-60	397	FK96-99	126	FR25	380	FW13-15	142	GA48	258
BB18-20	252	BK41	418	BR76	419	FB06	91	FH61-64	400	FL02	217	FR26	427	FW16-18	143	GA52	257
BB22	252	BK42	417	BR77-78	418	FB08-10	91	FH66	397	FL06-10	217	FR28-29	427	FW19	71	GA53	254
BB24-27	252	BK43	418	BR80-81	422	FB11-12	90	FH67-69	400	FL11	218	FR30	426	FW21-29	290	GA54	256
BB38	253	BK44	415	BR83	422	FB15	90	FH72	400	FL17	217	FR33-35	203	FW30-35	143	GA55	254
BB40-41	253	BK45-46	42	BR84-87	423	FB17-18	90	FH74-76	400	FL19-21	217	FR36	202	FW36-37	144	GA57	254
BB43-45	253	BK47-48	402	BR91-92	418	FB22-25	90	FH78	400	FL23-27	217	FR38-39	202	FW38-39	71	GA59	254
BB47-48	253	BK49	396	BR93-97	419	FB30-31	90	FH80	400	FL29	218	FR41	202	FW41-49	290	GA61-64	229
BB65	253	BK50	395	BR98	214	FB35-36	90	FH82	400	FL30	122	FR48-49	281	FW52	291	GA68	244
BB72-73	258	BK51-56	197	BW00	422	FB38-39	90	FH84	400	FL31	400	FR50	282	FW59-60	143	GA69	224
BB81	252	BK57	434	BW02-4	423	FB42-44	90	FH89-90	401	FL34	400	FR60	283	FW62-70	290	GA71	240
BC00	109	BK58-61	121	BW05	406	FB48-54	90	FH91	397	FL36	400	FR63	427	FW71-73	291	GA72-75	232
BC11-12	109	BK62-63	218	BW11-14	400	FB56	90	FH92-93	398	FL37-38	385	FT00-6	426	FW81-82	72	GA76-77	237
BC14-15	109	BK66	440	BW15	401	FB60-64	90	FH94	397	FL39-40	384	FT08	426	FW84-95	291	GA78	240
BC21-28	109	BK67	262	BW19-20	220	FB67-68	90	FH95	396	FL41	382	FT09	425	FX04	72	GA79	234
BC32-36	107	BK68	397	BW21-41	222	FB71-74	90	FH97-99	393	FL42	383	FT10-13	426	FX06	72	GA81-82	225
BC38-42	107	BK69-70	139	BW42-45	32	FB79	90	FJ00	114	FL43-46	430	FT14-15	380	FX07	292	GA83	269
BC48-49	109	BK71	397	BW46	33	FB81-86	90	FJ01-4	125	FL53	217	FT16	398	FX08-16	291	GA84-89	232
BC57-58	108	BK72-73	399	BW49-50	33	FB89-96	90	FJ05	114	FL54-55	383	FT17-19	429	FX18	291	GA90	269
BC61	108	BK74	122	BW51-52	34	FB97	91	FJ06-12	285	FL56	380	FT20-25	430	FX21-22	293	GA97	240
BC63	107	BK75-76	34	BW54-60	35	FB98	210	FJ13-17	124	FL58-59	381	FT26-29	426	FX23-24	403	GA98	236
BC65-72	107	BK77	256	BW69	110	FF00-18	90	FJ18-23	276	FL61	405	FT30	440	FX26-27	403	GB00-1	225
BC78-80	107	BK78	414	BW71-72	111	FF19	91	FJ24-26	133	FL66	212	FT31	66	FX30	403	GB02-3	261
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BC90-92	108	BK84-85	123	BW76	112	FF24	91	FJ28	131	FL76	213	FT34	88	FX40	291	GB08	269
BC95-96	108	BK86	267	BW78-80	114	FF26-32	91	FJ29	132	FL77	383	FT35	273	FX42-43	293	GB09-10	262
BF00-14	141	BK87	144	BW81-85	116	FF33-38	92	FJ30-31	131	FL78	381	FT36-37	128	FX48-51	403	GB11	270
BF15	142	BK95	102	BW86-88	117	FF39-46	93	FJ32-33	132	FL79	383	FT38	125	FX53-59	292	GB12	231
BF16-29	141	BK96	125	BW89-92	119	FF48-51	93	FJ34	131	FL80-82	218	FT39	259	FX62	293	GB13	245
BF31-41	141	BK97	122	BW94	120	FF53-56	88	FJ35	245	FL83-86	122	FT40	233	FX68-72	404	GB14	270
BF42-46	142	BK98	119	BW98	120	FF59-60	90	FJ36	244	FM00-1	126	FT41-43	271	FX76-77	292	GB17	268
BF48-73	142	BL00-10	74	BX00-3	86	FF61	398	FJ37	260	FM02-9	39	FT44	419	FX80	292	GB18	270
BF75-85	142	BL11-16	75	BX05	86	FF62-65	399	FJ38-40	389	FM10	193	FT45	132	FX87	293	GB19	239
BF86-94	80	BL17-21	380	BX07	86	FF66-69	197	FJ41	118	FM11	110	FT46-50	131	FX88-91	404	GB20	228
BF95	253	BL22	295	BX10-16	86	FF70-72	393	FJ42-43	403	FM12	114	FT51-52	132	FX93	404	GB21	259
BG01	106	BL23	206	BX24-41	87	FF73-76	395	FJ44	424	FM13	39	FT53	233	FX94-95	72	GB22	260
BG03-5	106	BL24-29	75	BX46-47	87	FF77	396	FJ45	122	FM14	40	FT54	417	FX96	71	GB23	270
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BG20	105	BL45	295	BX92-95	87	FF94	398	FJ56	373	FM35-36	40	FT62-63	128	FY07-8	415	GB29	264
BG23	105	BL46-56	74	BX96-97	123	FF96	397	FJ57	222	FM37	110	FT64-65	129	FY10	416	GB30-31	260
BG27	104	BL57-59	80	BX99	255	FF98	397	FJ58-60	103	FM38	199	FT66	133	FY12	416	GB32-34	260
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BG36-37	104	BL64	288	BY05-8	213	FG03-4	417	FJ62	125	FM40	119	FT68	292	FY17	417	GB37	264
BG38-41	105	BL65-66	80	BY12-17	213	FG05	424	FJ63-69	380	FM41	120	FT69	257	FY19	417	GB38	256
BG43	105	BL70	80	BY20	213	FG07	421	FJ70-71	118	FM42	119	FT70-72	125	FY21	417	GB39	264
BG45	104	BL71-72	77	BY23	213	FG08	427	FJ72-73	116	FM43	120	FT73	437	FY22	416	GB40	261
BG46	105	BL73	184	BY26-27	213	FG09-11	422	FJ74	112	FM44	119	FT74	125	FY26-27	41E	GB41	268
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BG49	105	BL77	74	BY42	213	FG13	182	FJ77-84	117	FM47	127	FT76	422	FY33	218	GB43	271
BG50	104	BL82-83	74	BY44-45	213	FG15-17	182	FJ85	112	FM48	399	FT78-79	92	FY34-43	420	GB44	245
BG51-52	105	BL85-88	74	BY50	213	FG18-21	133	FJ86	114	FM49	227	FT80-84	102	FY45-46	420	GB45	265
BG53-54	106	BL90	74	BY55	213	FG22-24	122	FJ87	115	FM50-54	118	FT85	115	FY49-52	421	GB47-48	267
BG55	105	BL92	74	BY57-59	213	FG25-27	121	FJ88-89	111	FM55	408	FT86-90	125	FY53	422	GB50	239
BG60	106	BL94-96	74	BY62-63	213	FG28	131	FJ90	112	FM57	408	FT91-92	118	FY55-57	421	GB51-52	230
BG63	105	BQ10	104	BY65	201	FG29	132	FJ91	119	FM59	384	FT93-95	112	FY59	424	GB54	257
BG64	106	BQ14	104	BY66-68	203	FG30-31	133	FJ92-97	120	FM60	405	FT96-99	127	FY62-63	425	GB55	265
BG65	104	BQ17	106	BY73	247	FG32-34	143	FJ99	113	FM77-78	428	FV00	127	FY64-67	425	GB56	264
BG66	105	BQ18	105	BY76	379	FG36-39	143	FK00	114	FM79-82	429	FV01	396	FY68-69	425	GB57	265
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MAPLIN MAGAZINE BACK ISSUES

Issues 1 to 8 and 10 to 12 of the Maplin Magazine are now sold out, but a reprint of the projects only from each issue is available. Copies of issues 9 and 13 to 16 are still available (at the time of going to press), but when sold out, they will be replaced by a reprint containing only the projects.

PROJECTS BOOK 1

Projects include a programmable mains timer controller for up to 4 mains appliances with up to 18 on or offs. There's a superb 120W MOSFET Combo Amplifier with built-in flanger and five-step equaliser. Other projects include a Temperature Gauge, a children's party game - "Pass The Bomb", a Car Battery Monitor, Peak Level Indicator, Games Timer and two others.

Order As XA01B (Maplin Project Book 1) Price 75pNV

PROJECTS BOOK 2

Projects include a Home Security System with six independent channels, 2 or 4-wire operation, main and external tamper-proof cabinets, and detection of open or short circuits or just resistance change, giving a high degree of protection with excellent long-term reliability. Our Digital Multi-Train Controller controls up to 14 locos on the same track, and there's a Digital MPG Meter, and a multi-mode Stopwatch.

Order As XA02C (Maplin Project Book 2) Price 75pNV

PROJECTS BOOK 3

Projects include a full-travel, full-size 43-key keyboard for the ZX81, which makes graphics, functions and shift lock, single key selections. Plugs directly into sockets inside ZX81. The superb 25W rms per channel stereo MOSFET amp kit includes the cabinet and printed and punched chassis. Also Home Office type-approved Radar Intruder Detector which gives coverage up to 20m and a Remote Control for Train Controller.

Order As XA03D (Maplin Project Book 3) Price 75pNV

PROJECTS BOOK 4

Projects include a high performance 8-digit 10Hz to 600MHz Frequency Counter. There's an Ultrasonic Intruder Detector, a Remote Controller for the 25W MOSFET stereo amp, an I/O Port for the ZX81 and a Telephone Exchange for up to 32 extensions on 2-wire lines. It's ideal for home, office or factory. This book includes details for up to 16 lines.

Order As XA04E (Maplin Project Book 4) Price 75pNV

PROJECTS BOOK 5

Projects include a 300-baud Modem enabling you to send data to your friends over telephone lines anywhere in Europe, or talk to our computer. Other projects include a 12V DC to 240V AC Inverter, a Sounds Generator for the ZX81, a Timer for the External Horn and Panic Button for use with our Home Security System, more projects for Model Trains, a Central Heating Controller and a feature with circuits about Interfacing Micro's.

Order As XA05F (Maplin Project Book 5) Price 75pNV

PROJECTS BOOK 6

Projects include the VIC20 and ZX81 Talkback, allophone-based speech synthesisers that give unlimited vocabulary, plus an article on speech synthesis techniques using allophones. Other projects include a 400W MOSFET amplifier with loudspeaker protection, TV Sound and Inverse Video from your ZX81, Damp Meter, Scratch Filter for old records and 4 others.

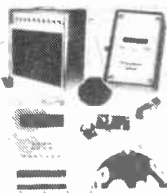
Order As XA06G (Maplin Project Book 6) Price 75pNV

PROJECTS BOOK 7

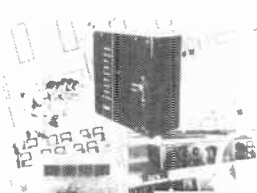
Projects include Modem/RS232 Interfaces for VIC20 and ZX81, an Enlarger Timer/Controller, a DX'er's Audio Processor and a Sweep Oscillator. Also there's a CMOS Crystal Calibrator for radio amateurs to check receiver calibration and band position.

Order As XA07H (Maplin Project Book 7) Price 75pNV

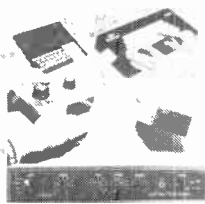
MAPLIN PROJECTS



MAPLIN PROJECTS



MAPLIN PROJECTS



MAPLIN PROJECTS



MAPLIN PROJECTS BOOK FIVE



MAPLIN PROJECTS BOOK SIX



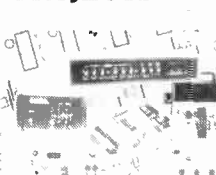
MAPLIN PROJECTS BOOK EIGHT



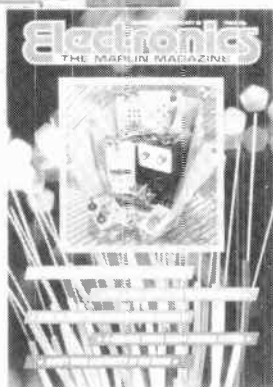
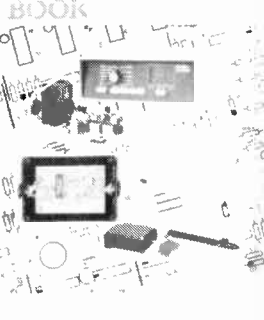
MAPLIN PROJECTS



MAPLIN PROJECTS



MAPLIN PROJECTS BOOK



PROJECTS BOOK 8

Projects include Modem RS232 Interfaces for Spectrum and Dragon 32, a Logic Probe with 7-segment unambiguous read-out for TTL and CMOS, a programmable electronic Codelock, the Synchime bell synthesiser, I/O Ports for the Dragon 32, the Minilap Power Supply, and a Doorbell for the Deaf.

Order As XA08J (Maplin Project Book 8) Price 75pNV

MAPLIN MAGAZINE ISSUE 9

Projects include a full-size, full-travel Keyboard for the Spectrum featuring single-key operation of most multi-key functions, an Infra-red Movement Detector for indoor and outdoor use, an Extendiboard for VIC20, an Oric Talkback speech synthesiser, an Adaptor to turn your multimeter into a Frequency Meter, an FM radio that needs no alignment, a High Resolution Graphics board for ZX81, a Dynamic Noise Limiter for 'Walkman'-type units, an ExtendiRAM for ZX81, a Logic Pulser, and six others!

Order As XA09K (Maplin Magazine Vol.3 No.9) Price 70pNV

PROJECTS BOOK 10

Projects include Spectrum Easyload which enhances cassette loading with the Spectrum, an 80m single-sideband Receiver, an 8W 12V Fluorescent Tube Driver, a 2.8kW 240V Controller, an Auto-Wah effects unit, a Modem Interface for the Oric, an Extendiport for the Dragon 32, and an expansion unit for the Digi-Tel telephone exchange from 17 to 32 extensions.

Order As XA10L (Maplin Project Book 10) Price 75pNV

PROJECTS BOOK 11

Projects include Mapmix, a six channel Audio Mixer for mono or stereo with twin VU meters, a Noise Reduction Unit, a Xenon Tube Strobe Driver module, a Ni-Cad Charger with many novel features, a Servo and Driver module, an Enlarger Exposure Meter, a Motherboard for the BBC Micro, an 8-Channel Fluid Detector and five others.

Order As XA11M (Maplin Project Book 11) Price 75pNV

PROJECTS BOOK 12

Projects include an RTTY unit which features fixed and variable tone shifts, VCO controlled filters, receive and transmit capability and RS232 port for direct connection to your computer. Simply plug in to your receiver or transmitter. Other projects include a Light Pen, Computadrum, PWM Motor Driver and five others. Also included is a Navigation System that provides self-steering for your cruiser or yacht using ZX81.

Order As XA12N (Maplin Project Book 12) Price 75pNV

MAPLIN MAGAZINE ISSUE 13

Projects include a 4-channel Radio Control System with two on off channels and two proportional channels; an Explosive Gas Alarm which will detect Butane, Propane, Methane, Town Gas, Natural Gas and Petrol Vapour; a Flash Meter with a range from 15.6 to 190 and 25 to 400 ASA; a Musical Announcer with 28 different tunes; a Mains Controller for the 8-Channel Fluid Detector; plus seven others.

Order As XA13P (Maplin Magazine Vol.4 No.13) Price 75pNV

MAPLIN MAGAZINE ISSUE 14

Projects include the Trundle Robot that was featured on Channel 4's '4 Computer Buffs'; a Mains Electricity Detector which can detect the presence of mains electricity from up to 2 inches away whether current is flowing or not - free pcb supplied with magazine; an I/O Port for Spectrum computers with buffered 2-way 8-bit data bus and direct keyboard access; Driver Module for our bargraph displays; Model Train Controller with full inertia control; a 4-Channel PWM Controller for servo's and motor drive systems; plus an Analogue Thermometer, Temperature Alarm and four others.

Order As XA14Q (Maplin Magazine Vol.4 No.14) Price 75pNV

MAPLIN MAGAZINE ISSUE 15

Projects include a Z80 CPU Module with test programs which can be used as the central processor for a more complex computer system; an Ultrasonic Car Alarm which is activated by any method of entry to your car; a 6-Channel Equaliser for six string electronic guitars; an Electronic Crossover for 3-way loudspeaker systems that includes three matched output power amplifiers; a Modem Interface for the Sharp MZ80K computer; details of the Zero 2 Turtle Robot; plus a NAB Tape Pre-amplifier, and four others.

Order As XA15R (Maplin Magazine Vol.4 No.15) Price 75pNV

MAPLIN MAGAZINE ISSUE 16

Projects include a Data Communications System which uses the mains wiring itself to transmit and receive serial data between units in the same building on the same phase; a Floodlight Controller for use with our Infra-red Intruder Detector Kit; a 16-Channel Logic IC Tester which interfaces with your oscilloscope to display the information on the screen; a Parallel Serial Interface for the Spectrum computer; the first part of a project to allow a Centronics facility to work with an IBM Golfball Printer; plus a Transistor Checker, SW Aerial Amplifier, and five others.

Order As XA16S (Maplin Magazine Vol.4 No.16) Price 75pNV

