KW 202 Receiver.
One of the finest Amateur Band Receivers on the market. SSB filter and "Q" Multiplier. Excellent sensitivity and stability. Two-speed tuning 10-166 metres.

KW 204 Transmitter.
Well-known for really good audio quality (SSB) and a favourite with CW enthusiasts. 10-160 metres. Reliable PA Tubes (2 x 6146).

KW 108 Monitor Scope.
Monitor your transmissions 10-160m. Two-tone test generator incorporated to ensure optimum linearity for SSB.

KW 107 Antenna Tuning System
Incorporates, E-Z match, SWR/RF Power meter Dummy load, Antenna Switch. A high power version KW 109 is also available.

Other KW Favourites.
KW 2000E Transceiver 10-160m. a quality product; KW 1000 Linear Amplifier; KW E-Z match ATU; KW 160 ATU; KW 109 SWR/RF Power meter; KW Dummy Load; KW Traps (the original and Best); KW Trap Dipoles; KW 109 Supermatch (High power version); KW Low pass Filter; KW Balun; KW Antenna Switch.

Stockists for Hy-Gain beams and verticals, CDR rotators, Shure microphones, etc.

KW Spares are normally carried for a minimum of five years after date of manufacture of equipment.

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(Decca Communications Limited)

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Tel.: Dartford 25574/219191

Easy Terms on Equipment available over 12, 18 or 24 months.
During recent months our Representatives have visited major Amateur Radio distributors in the U.K. with a view to appointing a Sole Agent to handle our exciting new range of Amateur Equipment.

The major consideration in making the appointment is that the distributor must set the very highest standards of after-sales service which implies workshop facilities capable of maintaining such standards.

We have pleasure in announcing that we have chosen LOWE ELECTRONICS to be our appointed U.K. Sole Agent for Amateur Equipment.
NEW! 2 METRE CONVERTER KIT — Read on

DO YOU WANT TO RECEIVE AND TRANSMIT ON 2 METRES OR 4 METRES?
EUROPA TRANSVERTER—EX-STOCK
4 metres SSB is quite popular now, the new owners of 4 metre Europas tell me they look very good alongside their 2 metre one. The Europa gives you:

* Well established and highly reliable design.
* Direct plug into accessory socket on Yaesu/Sommerkamp equipment—multicore lead supplied. Compatible with other transceivers and receiver/transmitter combinations. We can tell you how to do it, with Heathkit, KW, Trio etc.
* High transmit power—up to 200W input—50 per cent efficiency.
* Excellent receive converter performance—2dB noise figure.
* Extremely stable operation.
* Extraordinary clean output.
* Attractive appearance inside and outside—size 9" x 4½" front panel 4½" deep.
* Low price: £76.68 complete. £65.18 less valves—valves required are 2 off GGV03/10, 1 off QQVO6/40A. Additional 12.6V transformer for use with Yaesu equipment (FT401, etc.), £3-24 or in a case to match the Europa £6.37.

DO YOU WANT TO RECEIVE BETTER ON 2 METRES?
2 METRE PRE-AMPLIFIERS (2 MODELS TO CHOOSE FROM)—EX-STOCK.
If you want the ultimate in 2 metre sensitivity:
THE SENTINEL LOW NOISE FET PRE-AMPLIFIER—EX-STOCK
* Built in a box which matches our converters.
* Isolated supply lines make it compatible with any existing supply polarity.
* Low noise figure—1dB. Gain—18dB.
* High selectivity tunes circuits. Price £7.36.

If you want a small unit:
THE PA3 DUAL GATE MOSFET PRE-AMPLIFIER—EX-STOCK
* Small (about one cubic inch) printed circuit pre-amplifier developed to fit inside transceivers where it can be wired into the receiver aerial lead after the c/o relay.

DO YOU WANT TO RECEIVE ON 4, 2 AND 70 cms?
STILL THE BEST AND THE MOST POPULAR CONVERTERS:
SENTINEL DUAL GATE MOSFET 2 METRE OR 4 METRE CONVERTERS.
Don't take my word for it. Ask around. We have the letters from people with several makes of converter telling us that ours outperform the others. Nothing I can say is more convincing than what the customer says.

SENTINEL 2 METRE 28-30 MHz CONVERTER KIT!
To all those who have asked us to make a converter kit, good news. I have said in the past that we did not do a converter kit because of the alignment problem. However, for the past two years we have manufactured 28-30 MHz converters using 116 MHz crystals and this makes alignment a simple task, using a multimeter and your receiver. The kit comes complete with a box and all components as used in our standard Sentinel converters, at a cost of about the same as you could pay for the components, only £11-00.

To obtain any of our products, we can despatch by return of post. We give same day C.O.D. Service. You can call in here any time to look at the gear. Queries? Write or ring if you have any questions. 12 months' guarantee on our products. Paul G3MXG.

SOLID STATE MODULES 63 Woodhead Road, Solid, Lockwood, Huddersfield, HD4 6ER Phone 0484-23991
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Send us the coupon now and we’ll send you your free catalogue, with details of these and other exciting new models. Or, if you happen to be in London or Gloucester, call in and see us. The London Heathkit Centre is in Tottenham Court Road (where else?) at no. 233.

The Gloucester showroom is next to our factory in Bristol Road.

Either way, we’re waiting to hear from you soon.

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Tel: Gloucester (0452) 29451.

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- KT 66: £2-00
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- ECF 82: £38p
- EF91: £33p
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**5 pin type B Din plugs**

**PL 259 plugs, sockets and reducer**

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**5 pin type B Din sockets**

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- PT 4176A 3w. £1-20
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- 2N 3866 10w. £1-08
- ME 100 10w. £0-85
- 2N 5180 15w. £1-00
- 2N 2369A 15p.
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BE SURE TO SEE OUR ADVERTISEMENTS ON OTHER PAGES

ELECTRON HOUSE, 508-514 ALUM ROCK ROAD, BIRMINGHAM 8

HY-Q ANTENNAS announce the first of a new range of amateur antennas

These will feature for two metre a halo, four, six, eight and ten element yagis. Cross polarised yagis are also readily available.

2 Metre 2M/4-6-8-10
Specification:—
New linear balun matched to cover the band, 50 Ohms Impedance better than 1.5 to 1.0 Mazak Castings Aluminium bolts with mazak wing nuts High quality aluminium tube P.T.F.E. Balun.

All antennas listed plus many more are ex stock or a guaranteed 7 day delivery.

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IC-210 2M TRANSCEIVER
FM transceiver 144–146 MHz.
£89.00

LINER 2 SSB 2M TRANSCEIVER
144-10–144-35 MHz VXO controlled, direct frequency read-out. 15m. 10w. 6/... £142.00

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G Whipl Mobile Antennas
Tribander helical, 10-15-20m... £13.53
40m, 80m., and 160m. coils... £4.51
Telescopic whip for coils... £6.11
Basemount... £4.81
Multimobile 10-15-20m... £15.73

Accessories
50 ohm coax cable... £1.81
Pvc covered antenna wire... £1.21
Formerly "high power"

Prices Include 8% VAT
POSTAGE EXTRA—EXCESS REFUNDED
H.P. TERMS
BARCLAYCARD OR ACCESS

Welcome to Mosley Electronics

Some Antennas

Mono-Banders

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>A-310</td>
<td>3 Element, 10 metres</td>
<td>£27.00</td>
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<tr>
<td>A-315</td>
<td>3 Element, 15 metres</td>
<td>£30.00</td>
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<tr>
<td>Classic-203-C</td>
<td>3 Element, 20 metres</td>
<td>£25.50</td>
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<tr>
<td>A-92-S</td>
<td>9 Element, 2 metres</td>
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<td>DI-10</td>
<td>Ground Plane, 10 metres</td>
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<tr>
<td>DI-2</td>
<td>Ground Plane, 2 metres</td>
<td>£40.00</td>
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<tr>
<td>MCQ-20</td>
<td>20 metre Quad</td>
<td>£52.00</td>
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Dual-Banders

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<tr>
<th>Model</th>
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<th>Price</th>
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<tr>
<td>Elan</td>
<td>3 Elements, 10 and 15 metres</td>
<td>£45.00</td>
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<tr>
<td>Elan</td>
<td>2 Elements, 10 and 15 metres</td>
<td>£35.00</td>
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<tr>
<td>TD-2</td>
<td>Trap Dipole, 40 and 80 metres</td>
<td>£18.00</td>
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Quads

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>SWL-7</td>
<td>Dipole, 11, 13, 16, 19, 25, 31 and 49 metres</td>
<td>£18.50</td>
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<tr>
<td>RD-5</td>
<td>Dipole, 10, 15, 20, 40 and 80 metres</td>
<td>£12.50</td>
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TRI - BANDERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>TA-33 Jr.</td>
<td>High Power Model incl. Balun</td>
<td>£48.00</td>
</tr>
<tr>
<td>TA-33 Jr.</td>
<td>3 Elements, 10, 15 and 20 metres</td>
<td>£40.00</td>
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<tr>
<td>TA-32 Jr.</td>
<td>2 Elements, 10, 15 and 20 metres</td>
<td>£32.50</td>
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<tr>
<td>TA-31 Jr.</td>
<td>6 elements, 10, 15 and 20 metres</td>
<td>£115.00</td>
</tr>
<tr>
<td>Classic-36</td>
<td>Traps Vertical, 10, 15 and 20 metres</td>
<td>£13.00</td>
</tr>
<tr>
<td>MCQ-5B</td>
<td>Cubical Quad, 10, 15 and 20 metres</td>
<td>£80.00</td>
</tr>
<tr>
<td>El-Toro</td>
<td>Vertical, 20, 40 and 80 metres</td>
<td>£12.50</td>
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QUAD - BANDERS

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<tr>
<td>Aclas</td>
<td>Traps Vertical, 10, 15 and 20 metres</td>
<td>£25.00</td>
</tr>
</tbody>
</table>

Send for HANDBOOK containing full details of Antennas and other technical information. 33 pages 25p. Refundable upon purchase of Antenna.
YOUR CHOICE OF VHF EQUIPMENT - FM, CW, SSB, AM

**FDK MULTITRANSCEIVER**
Full coverage 144-146 MHz (148 MHz on receive). Separate I.F. strips for SSB/CW and FM. Antenna impedance 50 ohms. AC or DC operation. R.T.I. noise blanker. Tone dial. 10 watts or 1 watt output. Deviation 3-5 kHz but adjustable up to 15 kHz. Carrier suppression better than 45 dB. Sideband suppression better than 50 dB. Complete with microphone. Digital read-out. **PRICE £291.60.**

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1296 MHz Converters ....... **£25.92**
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70 cm. Converter ....... **£14.95**
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Transverters. Low loss valves ....... **£63.18**

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UR203 75 ohm low loss Co-Axial ....... **£34.38**
UR43 50 ohm Co-Axial cable ....... **£34.38**
300 ohm twin feeder ....... **£34.38**
B/Lee aluminium co-ax plugs ....... **£34.38**

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AR22R ....... **£29.70**
AR30 ....... **£27.00**
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CD44 ....... **£36.16**

**3" CERAMIC INSULATORS**
**PRICE £3.60**

**B & W 5-WAY ANTENNA SWITCH**
**PRICE £6.48**

**B R T E L L E M M I T T E R**
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Yaesu 846 Hand Microphone ....... **£6.30**
Shure 201 Hand Microphone ....... **£5.95**
Shure 444 Desk Microphone ....... **£16.00**
Electro-Voice 619 Desk Microphone ....... **£28.35**
Electro-Voice 715 Hand Microphone ....... **£17.45**

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40m., 80m. and 160m. coils, each ....... **£4.51**
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Send S.A.E. for literature on this range.

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75 ohm twin feeder ....... **£34.38**
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UR67 50 ohm Co-Axial cable ....... **£34.38**
UR203 75 ohm low loss Co-Axial ....... **£34.38**
Morse Practice Oscillators ....... **£2.75**
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Tech 15 Grid Dip Meters ....... **£20.00**
Multimeters ....... **from £5.00 to £20.00**

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Due to heavy postal charges, please forward S.A.E. for catalogue. All our prices include VAT. Postage extra on small items. Carriage charges by arrangement.
We can arrange delivery and collections in some areas. We pay cash for good second-hand receivers, transmitters, transverters. Send all details and the price you require. Our second-hand range changes quickly. Please let us have your requirements. If we do not have the model you want in stock, we will let you know as soon as we do. Full after sales service on all equipment. Three months guarantee on second-hand equipment.

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On the spot HP facilities. One or two deposit, balance payable over 6, 12, 18 or 24 months. Credit terms 10% deposit and balance over 9 months.
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The Superbly engineered YO-100 MONITOR SCOPE

FOR THE SERIOUS OPERATOR THE YO-100 ALLOWS YOU TO
★ MONITOR YOUR TRANSMITTED SIGNAL
★ TUNE FOR MAXIMUM P.E.P.
★ MONITOR RECEIVED SIGNALS
★ ADJUST CARRIER SUPPRESSION
★ PROVIDE 2-TONE TEST SIGNAL

(Delivery is Ex-stock S.A.E. for details)

"ALL RECEIVERS 'FALL OFF' AT 30MHz!"
This has been the general opinion of receiver sensitivity performance for years and still applies to some modern equipment! However,

It does not apply to Yaesu equipment!

"You don't believe us? Then here are the facts!"
Take your pick! Either refer to the R.S.G.B. Review April 1973, or our test on an off-the-shelf

YD-844 SP-400 FT-401

RECEIVER MEASURED PERFORMANCE
In order to compare receiver performance figures one must determine the following:
1. "Voltage": is it emf or pd across, say 50 ohm input? There is a 6dB difference!
2. The signal + noise to noise ratio (S + N : N) in dB's.
3. The frequency at which the measurements have been made.
4. The bandwidth used.

Just in the same way as one can't compare apples with oranges, nor can one compare sensitivity figures unless the same standards are used. To use a narrower bandwidth would seem to give a receiver a better noise performance.

Equipment used for tests: Marconi signal generator TF2002AS, Digital Synchroniser (Marconi) TF2170AF, Power Meter TF2500.

<table>
<thead>
<tr>
<th>SENSITIVITY</th>
<th>Input Freq. MHz</th>
<th>S + N : N for 0-5µv emf</th>
<th>S + S : N for 1-5µv emf</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>16</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>75</td>
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<tr>
<td>287</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

| FV-401       | 25             | 25                      |

(Sensitivity figures are given in dB and refer to the noise + signal for 0.5µv emf and 1-5µv emf, respectively.)
SPECIAL OFFER! YOUR LAST CHANCE TO BUY SP-101, £9.90, FP-75 or DC-75 FOR YOUR FT-75, £16.50 EACH (INCLUDING VAT)

YAESU PRICES (FREE DELIVERY BY SECURICOR OR POSTAGE ON SMALL ITEMS) EXCLUDING VAT

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- FP-75 AC PSU for FT-75: £135
- DC-75 DC PSU for FT-75: £135
- FT-101B: £230
- FP-200: £130
- DC-200 DC PSU for FT-200: £51
- FT-40I: £310
- FT-501: £375
- FP-501 AC PSU for FT-501: £53

**HF RECEIVERS**
- FR60B + CAL: £67
- FR-101D: £245
- FP-101: £220
- FR-400DX: £155
- FR-400DXC: £110

**VHF TRANSCEIVERS/PSU**
- FT-101B 12 ch.: £115
- PP-2AC AC PSU/SPKR for FB: £38
- FP-2AC AC PSU/SPKR for FB: £71
- FP-2AC + Batts.: £180
- FT-2 AUTO AC/DC: £157

**TEST EQUIPMENT**
- YC-35S 35MHz AC PSU: £99
- YC-355 35MHz AC/DC: £110
- YC-355 220 MHz AC/DC: £127
- YO-100 Monitor Scope: £93

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THE SHORT WAVE MAGAZINE
September, 1974

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SHORT WAVE MAGAZINE

(GB3SWM)

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Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention—see any issue. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

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For us, the last three years or so have been particularly difficult. During that period, we have had two increases in printing charges. The cost of paper has risen steadily. Postage and distribution rates have gone up no less than three times. In step with all this, there have been increases in all the day-to-day expenses of running the business.

Until now, it has been possible, by the most stringent economy and careful management, to hold off the effect of these cost increases. The cover price has remained unchanged since January 1972.

The position now is that—with great reluctance and after the most careful consideration of the foreseeable circumstances—we have to put the cover price of SHORT WAVE MAGAZINE up to 30p, to take effect with the next (October) issue, due out on September 27. This is the first increase for nearly three years. Because of the heavy postal charges now in force (and further increases in prospect) we have also to rationalise the all-in charge for direct subscribers—that is to say, those who receive their copies by addressed mail. Therefore, and also with effect from October 1st, the subscriber rate will be £3.75 for a year of 12 issues, with posting at least one day before publication date, and no distinction as to postal category.

In the meantime, subscriptions now running will be honoured at the old rates until their expiry. (And it might be pointed out that this means in effect, our carrying, in the case of these standing subscriptions, the higher postage rates already in force for many months yet).

For nearly 40 years, since the inception of SHORT WAVE MAGAZINE, we have always enjoyed the support of a strong following, readers and advertisers. We hope that those who have not been with us very long will understand the present circumstances and continue to give us their support.
THE SHORT WAVE MAGAZINE

September, 1974

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

Perhaps the main feeling in the mail this time is that conditions, like the Stock Exchange, have managed to make something near rock-bottom—as though the sunspot shortage were not enough there has been much storm with attendant noises of rain and lightning static. True enough, but even under these conditions it has been possible for some interesting QSO's to take place on all the bands, but only provided one was prepared to scan them all and take the one which showed the best combination of effects at that particular time, and provided one did not expect every QSO to be a new country.

During the period under review your correspondent enjoyed several QSO's with G2NJ, G3KPO and G2BJY in that order, to have a fine natter with G2NJ, marvel at the things with people which listened to broadcasings, or chased DX with G3KPO and his collection of working antiques, and to marvel at the ingenuity and improvisation in the G2BJY tries his luck on 80m. from the 11th and above.

Of course, the topic was radio—what else?—and our united, considered opinion is that although conditions are poor, it's still a great game.

Looking round the bands, we start on 160 metres, a good old band, rather neglected of late years. This month the static level most of the time was 8 S9, but many times you could only get a 2X9 or less from the high bands such as 80. The worst was on 10, where it was normal for static to be between 3 and 4 S9 in the early morning.

DX however has been much storm with attendant noises of rain and lightning static. Four G3ATU (Roker) has been silent for a long period, but makes a comeback to take issue with his old buddy G2HJKU on the relative ease of working DX on SSB or CW. As Stan sees it, CW sounds the same wherever it comes from, be it T9x or T7ck, but when you start to listen to voices the trouble begins. For a start, a great many French, Spanish and Portuguese DX stations don't speak English, what exactly the reason is, language or go without! Then there are the gabbler stations, the chaps who give their own call every two hours, the "hola-hola" set, and the "tuning-up on rare DX" brigade, who between them all add up to a right mess! All this, of course, is looking at it from the point of view of a G after his bit of DX, but G2HJKU himself says it is always as ZB2CJ, things alter somewhat! For a start, one is DX right under the noses of the Southern Europeans, so a lot of the problems speak with Italian accents! In addition, a call on any band, with the possible exception of Ten, generates an instant pile-up, and although the ploy of "listening three up" (or down) for the case may be does help, there is always a residuum of dimwits blowing away at zero-beat, whether on CW or SSB—but whereas one can be defeated on Sideband, on CW that 600 Hz filter does its stuff to help. Summing it all up—its easier to work the bands this month!

G4CKM (Paignton) has found the call of his particular saltmine rather too pressing of late, which lost him a lot of operating time. Now there is a matter of a couple of months on the Continent, touring round ON, DK, HB, I, YU, SV, F, EA and CT1 minus rig; but it is hoped to make a detour and find time to look in at 4UIJTU, which visitors can operate. Return due for October-end, hopefully before the autumal conditions break.

Forty Metres

Basiclly, a wicked waste of a good band. As many of his friends will point out, your old scribe is much more of a DX listener than a DX operator these days, and one of his pet hobby-horses is the treatment of Forty. Those who use it, in the main, are only out for inter-UE phone or CW ragchews, and time and time again one finds them sitting madly for the DX and disregarding the fact that the guy who called first is at least entitled to finish his QSO before the ruckus starts! In addition, on Forty, there is a remarkable tendency, happily decreasing of late years, for those on channels near the DX to be possessed of fandish chirs and clicks which cover the DX signal even though off his nominal frequency! But, there are W's, JA's, VK's, ZS's and such, not to mention South Americans, there for the asking at times when you and I can be operational. Perhaps we should call a World DX Day on Forty, when all the DX stations in the world and all the chasers thereof, would forsake the other bands and arrive on Forty where the result may be knocking off the DX and QRM'ing the lids would possibly clear the band of boneheads and bring it to a realisation of its potential!

The improvement in the arials at G8HX is such that he now finds RF all over the case of the T and receiver as soon as the key is pressed—the penalty of working a basically Marconi system from an upstairs room! Frank is going to try tuning the earth, not for a quarter but a half-wavelength, so as to get the RF off the panels. He has now worked 305 DOK areas on this band and wonders if he will ever get the cards in for the DLD-200, although he has the DLD-200 in the bag. Another one, this time from SP-land, is the Nicolaus Copernicus Award; a just commoration of a brilliant thinker.
G2NI had several contacts with G2JL, G2JL/MM and G2JL/MM, from his yacht \textit{R\`ene de Mai}, following his progress along the west coast of France to his objective in Northern Spain. Another call used on the trip was FOGR/MM, and regular skeds were kept with G3GQS. The gear at G2JL/MM comprises a Marconi transceiver at 80 watts and a vertical, quarter-wave, aerial.

G2HKU used both modes, but not being one to favour either, and the SSB raised YV5MO and 9H1BX, while CW accounted for W1WQC/A.

VE3HHN/G4DGZ has recently been in the U.K. at Sutton, Surrey, but at home hails from Toronto—his address for all G4DGZ contacts is: Colman M. Jones, G4DGZ/VE3HHN, 7 Jackes Avenue, Apt. 108, Toronto, Ontario M4T-1E3, Canada. He only managed one U.K. contact during the two months prior to his trip over here, in G3JL, though he had many, both at club level and on the air, to compare the different approaches in G and VE. Look out for him on Forty or Twenty. At 15, he has a busy school programme and a week-end job, but he will, nonetheless, be pleased to offer service to anyone wanting a QSL manager—either write him, or look out for him on CW at the low end of Forty, around 0300-0500z.

Although he uses mainly the HF bands, G4CXM does not neglect his chances wherever they may be; Forty seemed good to VK and ZL in the mornings, and a new country was raised on 40m. in the shape of LU8ADK, worked on CW.

Now Ten

Still the odd event of interest, despite the shortage of sunspots. Only rare looks at Ten, reports G4CXM, although Ray didn't miss it all, as he worked IS0XBU and OY2J on Sideband.

G3NOF (Yoville) returns to the lists after a spell off due to trouble with the machinery. On Ten, Don made no contacts, but notes that although the band was generally dead when he looked, there were some true short-skip openings with strong U.K. and near EU signals, with a few USSR stations also to be heard.

There is not a lot said about Ten, aver G4AGZ (Hayle) and he proceeds to point a moral by noting his score of 95 countries worked and 75 confirmed since October 1971. In addition, David has a list with a few USSR stations also to be heard.

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Atlantic, XE1AAV, YV's, Z7DSD, ZF1GA, ZS3AW, SW1AR, G6YHJ. Not bad for an ailing band!

His 14 MHz CW, reports G4CXM, went out to VK2EO, VK3AMM/2 (otherwise G6XJ in disguise, and it is interesting to note that G6XJ also had a hand at the G4CMX end, having manufactured himself the trap dipole that station used for the QSO!) KH6CF, UK9MBA, UK9GBA, CX2AQ, VE1HGN, VE3HBF and GW4FC, while his SSB penetrated to the receivers at PY4DK, SQ9KRT (a new variation of the SP prefixes), YV4AKK, LU4ECC, SM3AQO, OJ9AB1, DM8SOP, O66HSG/TF, GC1GSA, LX1XJ, CF3DTG and VP9GE, illustrating clearly the short-skip-mixed-with-DX which has been so much the keynote of the band this time.

G3UZ (Goring-by-Sea) always has his tuppence-worth on Twenty, on the key, and this added up to QSO's with JA3DGE, JA3EFH, JASPL, ZE3AA, YK5CDL, CE5BB, ZS4OQ, 9Y4TR, 9M2DWA, LU2CAP, UM8FI, UH8AC, UH8MAX, PY1ZAE, CT3AS and W5QBP/MM.

On operating tactics, G2BHY (Walsall) tried a CQ DX one evening at 1845z, and raised U8GAC; so he followed up this QSO with another “CQ DX,” which scared up VP2VBU, Tortola; then the VP2 disappeared under the calls from all Europe! Such are the manners of the permissive society. Other interesting QSO's on the band were had with ISOLSV, and OG7AA for a new prefix. On a different tack, that G8HX clicked with VK8HA. Frank also connected with Frank Pehoe, this time in the guise of a CW signal signing “K66C” and disappearing when called.

We have already mentioned G4DGZ/VE3HHN, and it remains for us to point out that this lad had dipoles only for 7 and 14Mhz, strung awkwardly out of an apartment building in downtown Toronto; to this he has coupled an FT-200. Pounding brass with such a set-up and working over to the U.K. pretty regularly on Twenty or Forty will soon turn him into a dab-hand at the game, we reckon.

The SSB from G2HKU percolated LG5SL in Morokulien, now fitted out with new Drake and Heathkit tackle, while on CW, Ted made his reckoning with KH6IJ, UA9URS, UL7WH and UV0EN.

This and That

GY7RR (Grimsby) mentions that W3CTR, well-known on the Ex-G club net on Twentff, has been back to his home town of Grimsby, where of course the lads at the Wheatsheaf reminded Don of the taste of good ale and talk. On a different theme, Charles feels we are all rather too touchy about the items we see in the public print about Amateur Radio. As he says, it is a hobby, not a sacred rite, and a piece for the general reader must be understood by him, which chops out all the jargon instantly. He feels that this “aloofness” about Amateur Radio transmits itself to the ordinary reporter trying to write up a story, who thus thinks of us as a toffee-nosed bunch.

Nice to hear again from 5N2ABG that was, now operational again as G4GGR with the same KW-200A, although the G-QTH is somewhat restricted in terms of aerials. Eric has all his 5N2ABG logs with him, and will QSL any contact short of a vertification, even though he has sent cards to all stations worked from 5N2-land.

A letter from W6AM (Long Beach) includes a photograph of XE1AA/XF1A, who has been top of the pile in no less than 32 of the big DX contests, attending the Visitors Day at W6AM's Rhombic Farm and looking into the bowels of the W6AM/6M kilowatt amplifier. On a different topic, Don has a couple of offerings: The energy crisis.
is just like the good old days — cooler rooms, candle light, rowing, sawing wood, and walking to the store!

G2BUY reverts to the question of home-brewing versus owning commercial and reckons the chaps who don't construct anything ought to have their licences amended to give them Citizen's Band status.

G2BUY gets support on this topic of home-construction from G2BON, not so far away, firing all his big guns in a mighty broadside of three pages of well-argued foolscap. Firstly, he enquires a bit acidly why in Heaven's name people in a sane society are prepared to spend upwards of £250 for just one piece of equipment? Again, is SSB in relation to AM just like stereo and mono—a mere gimmick? Something to promote sales? How many people in this country with Linear Amplifiers capable of over the kilowatt run them at the legal limit? By this argument it should be level with the chap who builds a kilowatt CW rig, loads it up to the lor and puts it on the air! Tom reckons these guys who have Quads at 60 feet, kilowatt linear and commercial rigs are not amateurs, but professionals; some have licences but have never done so much towards their station as hang up an aerial. His proposals to right the situation are these. First, scrap the R.A.E.; secondly, bring back the old AA licence; thirdly, a maximum of 25 watts input, CW only; fourthly, all gear, including aerials, to be home-built, the aerial to be home-designed also; fifthly, no transmitting types of valves or semi-conductors to be used, and lastly, operating procedure to be crystalized, a strictly switch-and-call operating procedure to be enforced; and any infringements noted to cause loss of the licence.

All this advocacy of home-brew and tighter licensing goes unopposed for the moment, so let yourself be heard on schedule. The revival of the old AA licence and of some tightening of the rules. However, the R.A.E. is essentially an international-law requirement and must therefore stay in some form or other. He would also agree to the idea of the first year on the air being with restricted power and CW, if only to train the licensee to an adequate CW speed and operating-procedure standard; the latter is far too sloppy on modern Phone bands. On the other band, the argument G2BON puts forward about AM is not so strong—it has become the standard for telephony for all but broadcast stations and business radio on VHF, not because of its manifest superiority, but because its band width is less and the carrier QRM from adjacent channels is eliminated, enabling narrower bandwidth to be utilized. In amateur terms it means three sideband stations in the area taken by one, hopefully well set-up, AM signal; one at the upper, one at the lower sideband, and one, with a bit of crud, sitting in the middle between the other two. With the rise in the number of amateurs on the air alone, to go back to AM would be ridiculous. Again, some 30% of all radio amateurs are truly professionals, in the sense that they earn their daily crust at some level in the electronics industry. As for this argument about the cost of a rig, just consider Mister Average, paying out up to a couple of hundreds for a colour TV and many £100's every couple of years or so for a shiny car the purpose of which is not more than to stand outside the house and impress the neighbours. Personally, G3KFE doesn't give a damn whether a station is commercial or home-brew, and he feels that any attempt at organising people to buy or to buy is a revenge to that kind of regimentation against which we fought Hitler's War.

On a much more light-hearted note, G2HKU notices the number of USSR stations on Phone who speak good English—but almost always with an American accent and idioms! Makes you think, doesn't it?

DX Details

Contest-wise we are in a relatively slack period, with nothing important on the horizon this month. However we do have the 1973 CW results from the CO-CW Contest, in which U.K. stations made a big 45% more for long enough. We had no representation in the all-band categories, but on the single-band front we note G3KWK fifth on Eighty, G1SOOR third on Forty, G3FXR fourth on Twenty, G3HCT second on Fifteen, and on Ten we see G5BAU at fourth, and G3RUX at sixth. Congratulations to all these stations on a fine effort in a highly competitive event.

That Spratly expedition by V5SMC proved abortive, in that when they came in sight of Spratly, it was occupied and had radio masts erected. Politically, there is strong feeling that the Chinese Republic had claims on this group in the China Sea area; thus it seems that the operation from Spratly is by 161A, 'way back, was the last Amateur Radio action we shall see from the Island, at least for a very long time.

Another one in the melting-pot was the Mount Athos expedition, due to fire up late-August and not believed to be on schedule. However, there is now doubt about the legality of these Mt. Athos forays, and it seems in dispute as to whether there ever has been any legal operation from Mount Athos—"legal," that is, in the Amateur Radio sense. However, if ARRL accepts the documentation and allows Mount Athos as a "country," then it can be a country for scoring purposes! So work 'em and QSL 'em first, and wait for the problems to sort themselves out afterwards! Activity from Tokelaus is likely if all goes well, the spark-plug here being WB6SCZB, who has been signing 5WAL of late.

Nauru operations by JA1OCA were due to start on August 31, and continue until September 8, with breaks to operate a cine camera, so as to record for posterity what a DX-pedition is really like for the operators.

Close Down

That's it for this month. Our thanks are due to all those who reported, and of course to Geoff Watts' DX News Sheet and the West Coast DX Bulletin for much information.

Deadline for next issue will be September 9 latest, addressed as usual to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-IRQ. And now for some DX, to hear or to work!

According to our correspondents, it was a case of "Woeful Woburn" on August 4—not the fault of the RSGB (as some seemed to think) but the Wx. In heavy and continuous rain, everybody present was, so to say, "confined to camp," under the dripping canvas of two large marquees. Added to this was the fact that the usual offices and the refreshment bars were about a quarter-mile from the scene of operations. You had to get wet to do anything or go anywhere.

On the other hand, the signposting and the talk-in facilities (organised by the Dunstable Downs Club) were excellent. There was a strong trade representation and no doubt the Wx, keeping the visitors under cover, gave a great fillip to business!

The Derby Mobile Rally on August 11 falls into quite a different category. The weather was good; the attendance up to standard (after all, this was their 17th such event in a continuous series); it was all, or could be, under cover; there was ample free parking (and nothing to pay to get in); and the attractions were those that have been provided especially for this event. Because of this, there was good trade support, and the press round the stands augured well for business. For years the organisation of this Rally has been undertaken by the Derby & District Amateur Radio Society, with Fred Ward, G2CV, and Tom Durn, G3FOY, taking the major role. Once again, they and their many helpers were in a Good Job.

A report will be run next month.
will include trade stands, bring-and-buy stall and a grand raffle.
Free admission and parking, refreshments available on site—
B. G. Capper, G4BDC, 36 Woodhill, Harlow, Essex, CM18
7JT, or B. W. Nappey, G3YDI, QTHR.

September 29: Organised by Peterborough Radio & Electronics
Society, at Walton School, Mountsteven Avenue, off Lincoln
Road, about four miles north of Peterborough city centre. Talk-in
2m/160m. from about 10.0 a.m. for the 11.0 a.m. opening. There
will be trade stands, a raffle and refreshments available on site—
A. Jackson, G8GNV, QTHR. (Tel.: Castor 353.)

For the Mobile Rally at Beverley,
Yorkshire, the car parking arrange-
ments were unusually efficient—
this is a general view of the assembly
of visitors' cars on what turned
out to be a very warm day.

Having his door leant on by, left to right, G4CXZ, G3YNO
and G4CRU was G3RDM, operating G3AMW/P on 160m. at
the Hull & District A.R.S. Mobile Rally.

"... got myself quite hooked on this
mobile lark ..."
For the Mobile Rally at Longleat, Wilts., organised by the Bristol group, one of the attractions for visitors was a working demonstration of weather-satellite tracking, the display being in an adjoining cabin, always crowded with viewers. This picture shows that these antennae need only be a few feet above ground. Regular readers will remember that G3HMO has had several articles in "Short Wave Magazine" on the subject of amateur Wx-satellite reception.

Specially on the Air

Following is the last of the activities notified under this heading. All interested should note the QSL procedure for Special Activity Stations, as explained on p. 201 of the June issue of SHORT WAVE MAGAZINE.

G3CAR, September 7: For the 28th annual Wycombe Show, The Rye, High Wycombe, Bucks, organised by Chiltern Amateur Radio Club, operating all bands 10-80m., CW/SSB. Skeds offered, and all contacts to be QSL'd by special card. Visitors welcomed.

--- A. C. Butcher, G3FSN, 70 Hughenden Avenue, High Wycombe, Bucks. (Tel.: 494 24835.)

GB3TC, September 13-15: Operated for the Tiptree Carnival, running all modes on all bands Top to two metres, with the possibility of RTTY on 80-20-2m. QSL’s direct or via bureaux—M. J. Quec, G3ZWW, 18 Oak Road, Tiptree, Essex, CO5 0NF.

GB3CSV, September 14: Put on by the Leicester 91st Scout Group for the visit of the Chief Scout, operating on two metres only. All contacts and reports QSL’s by special card—Harriman, 91st Leicester Scouts (this is all the QTH we get).

GB3BS, September 21-22: For the Basingstoke Show, Stratton Park, Kempshott, put on by the Basingstoke Amateur Radio Club, working 2/15/20/80m. HF-band operation on SSB, and FM on VHF. QSL’s via bureaux, or direct with s.a.e.—P. J. Sterry, G3CBU, Ashley, Orchard Road, Basingstoke, Hants.

GB3HFA, September 20-22: Put on for the "Hobbies For All" event, by Grimsby Amateur Radio Society, working all bands, including two-metre SSB on 144.23 MHz. Special QSL card for the new county of Humberside—D. Johnson, G8HAE, 3 Ethelstone Road, Grimsby, Lincolnshire, DN34 4EF.
IN view of the increasing interest in UHF, the author decided that it was about time that he did something about the next band up from 70 cm. That decision taken, a review was made of current designs and operational techniques for 23 cm., and the conclusion arrived at was that there were two approaches which should be considered. One could go straight away for SSB via a suitable mixer (probably 1152/144 MHz) and run high power with a 2C39A or, better still, a 3CX100A5 (or a pair of them!) some form of parabolic dish antenna, possibly 5ft. in diameter to get adequate gain, and a really hot, and therefore very expensive, converter.

The second approach was to run fairly simple equipment and get the feel of the band and UHF techniques generally before proceeding further. This second approach was adopted.

The question then was whether to design and build from scratch or go, in part at least, commercial. Eventually, the time factor and non-availability of certain items of expensive test equipment decided the issue, and the present set-up at G3DAH consists of a mix of a 34-element Yagi, a modified version of the G4BEL pre-amp and the Microwave Modules converter and varactor tripler.

The Antenna

A look at the antenna mast, which now carries beams for 4m., 2m. and 70 cm. and, eventually an HF bands beam, ruled out the possibility of a dish of adequate size on weight and space considerations alone. Some sums were done on a corner reflector to see what gain might be obtained from this system. With two half-wave sides at right angles to each other, and a dipole driven element, a maximum gain of 12 dB can be obtained when the dipole is located 0.25 A from the corner. At 60° angle, a spacing 0.4 A gave maximum forward gain of 10 dB. Smaller angles were investigated, but the feed impedances dropped to very low values and, in spite of an increase of gain of some 2 dB, the arrangement becomes impractical.

The reflex aerial showed possibilities, particularly if two structures are stacked horizontally, when a gain of about 18 dB may be realised, but the assembly tends to be rather unwieldy with 2 A sides, and mounting presents a problem in the author's case.

A Yagi began to look the best bet, and several designs were examined, the final choice being the 34-element model developed by G8AZM. This has a gain of about 18 dB and is fairly simple to construct and feed. If the boom length of 6ft. presents a turning circle problem, it has been found that reducing the number of directors from 32 to 16 will not lose all the theoretical 3 dB since the current in the elements more remote from the radiator is small and contributes little to the forward gain. (G2DD quotes a loss of 0.1 dB compared with the expected 1 dB if seven directors are removed.)

It goes without emphasis that good quality co-ax must be used for the antenna feed. Belling-Lee BL.063 is suitable, fits Type N plugs, has a loss of about 4 dB per 100ft. and is reasonably priced. It may be noted here that Type N and Type BNC plugs and sockets have an upper frequency limit of 10 GHz, whilst the UHF type (PL259) is good to 200 MHz only.

Converters

The more obvious choice for the home constructor lies between converters with an IF of 144 MHz or those with a 28 MHz IF. It may be argued, with some justification, that an IF as low as 28 MHz is undesirable on this band, and indeed, in areas of high transmitter density, second channel QRM would probably be a nuisance.

Against this must be weighed the disadvantage of tying up a 2m. converter which might be wanted for cross-band working and, in the writer's case, of having a non-standard IF. There seemed little to choose between the two designs from other points of view—both required access to workshop equipment, and both gave comparable performance, but it seemed a good idea to have a look at what the professionals were doing before making a final decision.

The only 23 cm. converter commercially available is that produced by Microwave Modules of Liverpool, and this was examined closely. Fig. 1 shows the block circuit diagram. It uses printed circuit micro-strip techniques for all UHF and microwave circuitry, is small in size and economical to run. The mixer consists of two MA4882 Schottky diodes in a balanced configuration
The "Microwave Modules" varactor multiplier (left) and converter unit (right) for the 23-centimetre band, as discussed in the article. The VBC77J varactor is bolted through the chassis at the top of the left-hand enclosure, with the output and idler tuning circuitry to the right of it. In the converter itself, the osc. chain is above the p.c. board and below is the ring mixer. The input and output matching stubs are adjacent to the BNC sockets. Cigarette for size comparison.

driven by a hybrid ring. The antenna is connected to the ring at the central balance point which gives high sensitivity and good isolation between the antenna input and injection frequencies. A capacitive stub compensates for input lead inductance. The IF is picked off from the diodes via a ferrite transformer and feeds a 40673 dual-gate mosfet amplifier. The oscillator chain comprises BF152 and BFY90 transistors multiplying from a 105.6 MHz or 96 MHz xtal, depending upon the IF, and gives ample mixer injection. The model tested showed nearly 30 dB of gain and an overall noise figure of about 8 dB and, unless one is going into a very high price bracket for the input transistors, this result compared very favourably with other published designs. The use of the diode ring mixer inevitably means low input impedance and wide bandwidth. An interdigitated filter at the input was tried without conspicuous success, and finally a BFR91 preamp (Fig. 2) was constructed, and this improved both gain and selectivity. No spurious responses were detectable in the main Rx (FR-DX500), but half the injection frequency (634 MHz) appears, albeit at low level, at the antenna input socket and this could cause trouble with TVI. The pre-amp reduced this output to negligible proportions. From all these considerations, the decision was taken to use this particular converter. Fig. 2 shows the outline circuit of a pre-amplifier to a design by G4AHH which could hardly be simpler but which is very effective indeed.

Transmitters

With a low power driver on 432 MHz already available, the fairly obvious way to get on to 1296 MHz is to use a varactor tripler, bearing in mind always that such a method is unsuitable for SSB operation, although NBFM can be passed through at full power level and AM at half power. Valve triplers were considered, but required (in some cases expensive) power supplies, and they take up more space for a given output.

The Microwave Modules tripler gives 14 watts output for 24 watts input and the output is remarkably clean. The double tuned circuits at input and output contributed to this result, and looked after load impedance changes also. This power output is perfectly adequate to drive a high power PA of the 3CX100A5 type.

Varactors have some nasty habits if not set up meticulously with sophisticated test equipment (which the author does not possess) and the decision was taken to go commercial with the idea of adding amplifiers at a later stage.

The foregoing notes merely indicate one practical approach to getting on 23 cm. fairly quickly, without much trouble and without the need for expensive test equipment. There are, obviously, those who will wish to "roll their own" and other, more technical, solutions may be found in the literature for those with access to well-equipped laboratory and workshop facilities.

The following observations may be of some use to those who are stimulated by this article to have a go on UHF for the first time.

Except under extraordinary propagation conditions, very few contacts are made directly on 23 cm., the usual procedure being to set up the QSO on 70 cm. and then work on three times the 70 cm. frequency to avoid retuning the Tx. This practice also helps in locating a weak signal on 23 cm. As the use of transverters employing additive mixing rather than tripling becomes more
popular, this practice will diminish. If a transceiver is used somewhere along the line, a second, independent Rx is a great advantage, but if one is not available it is convenient to choose a 70 cm. frequency such that, when multiplied by three, the output lies between 1296-1 MHz and 1296.5 MHz so that the usual transceiver operated as an IF strip and covering the amateur bands in 500 kHz steps will not require bandswitching at either end of the QSO.

All the usual modes are heard on the band, with SSB on the increase. NBFM, in spite of reception (and other) disadvantages, and CW, have an edge over AM in that full power may be run through a varactor tripler stage.

Propagation is not limited to line of sight by any means (vide the QSO between G4BEL and OE2OML). The important thing is to have a clear take-off in the desired direction rather than a great amount of antenna height. With a good converter, 10 watts of RF output and an antenna with a gain of around 15 dB, ranges of about 100 miles should be possible under all but very poor conditions.

There is a significant increase in signal strengths during the late evenings and early mornings and long-haul skeds should be arranged to take advantage of this fact. A check on the two 23 cm. beacons, GB3DD on 1296-05 MHz and GB3LDN on 1297-95 MHz will confirm this statement. Failing reception of these beacons, listening to regular skeds, details of which appear in this journal from time to time, will indicate DX possibilities.

The author wishes to thank those who have so readily offered their advice and help, notably: G3JVL, G4AHH, G4ALN, G8ACN and G8FPH.

**TRANSISTOR CASCODE IF AMPLIFIER**

**DESIGN AND CIRCUITRY**

A. GOULDSTONE (G3TAG)

In the design of radio receivers and transceivers the importance of a good intermediate frequency amplifier cannot be over emphasised. It is in this section that most of the signal amplification takes place, and its performance will control the characteristics of the complete equipment.

Basically the unit should have a voltage gain of about 80-90 dB and should contribute as little noise as possible to the receiver as a whole. Additional requirements are good selectivity and the ability to handle signals of wide dynamic range.

Over the past few years developments in solid-state technology have made the first and last of these requirements quite easy to achieve. The second requirement (selectivity) is not the problem it used to be because the majority of IF amplifiers are now preceded by a high-performance mechanical, ceramic or crystal filter. It is, however, a wise precaution to limit the bandwidth of the amplifier to prevent the amplification of wide-band noise generated by the circuit itself.

**Cascode Amplifier**

An RF amplifier using a single transistor is not really suited for use in an IF strip. It is difficult to apply AGC to such a circuit without causing it to go non-linear. Therefore, strong signals will produce quite severe distortion. Also, if high stage gain is required neutralisation may be necessary to prevent instability. To overcome these problems a cascode circuit was chosen, an example of which is shown in Fig. 1. Input signals are amplified by the common emitter transistor Tr2, the collector of which is connected to the emitter of Tr1. This transistor is in the common-base configuration and serves, amongst other things, to isolate the input of the stage from the output. It will be noticed that there is quite a miss-match between the output of Tr2 and the input of Tr1, the output impedance of Tr2 being high and the input to Tr1 low. In practice this will not matter because the complete stage has far more gain than we will ever need. The un-bypassed resistor R1 provides negative feedback to the amplifier and is selected to produce a voltage gain of 40-45 dB.

A very useful point about the transistor cascode is its high output impedance. This allows the use of untapped RF and IF transformers without the loading problems imposed by the single transistor common-emitter amplifier. AGC can be achieved by varying the bias voltage of Tr1. This, by emitter follower action, will change the collector emitter voltage of Tr2, altering its gain.

**Improved Circuit**

A much better way is to include another transistor as shown in Fig. 2. This transistor, Tr3, forms a differential amplifier with Tr1. If the base voltage of Tr3 is a little below that applied to Tr1 this extra transistor will be cut off and will have no effect on the operation of the circuit. As the base voltage is increased, the emitter voltage of Tr3 will rise until it begins to reverse-bias the emitter of Tr1, reducing the amplifier’s gain.

![Fig. 1 Cascade Amplifier](image-url)
Complete IF Amplifier

Fig. 3 shows the circuit of a complete IF amplifier for 455 kHz using two gain controlled stages as described. The total voltage gain was adjusted to be about 80 dB by selection of the emitter resistors R4 and R10. It should be noticed that the whole primary winding of the Denco transformers is used, the collector tap being ignored.

The output of the final IF transformer T2 is fed via the step-up transformer T3 to an emitter follower Tr7. This provides a low-impedance drive for the AGC rectifier D1, ensuring rapid charging of the time-constant capacitor C14. This capacitor, together with the discharge resistor R20 and the cathode of D1, are connected to the non-inverting input of the DC amplifier ICI. The amplifier is floated midway between the +12-volt supply rail and ground by returning its inputs to the junction of potentiometer R17 and R18. Its output therefore sits at about +6 volts and swings upwards with increasing signal, progressively turning on Tr1 and Tr4. Potentiometer RV1 is provided to adjust the bias voltage of Tr2 and Tr5, and its setting will determine the level at which the AGC begins to operate.

The output voltage swing of ICI is about 600mV and may be used to supply AGC to a preceding RF amplifier and to drive a signal-strength meter. If manual gain control is required a switch should be included between the DC amplifier output and R22. The AGC line can then be taken to a potentiometer, the output of which can be swung between +6 and +7 volts.

Construction

The prototype amplifier was built on a PC board measuring about 6 x 2ins. Component layout and connections were drawn on 0:1in. graph paper and the drilling points transferred to the copper clad board by

---

**Fig. 2 Improved Cascode Amplifier**

**Fig. 3 Circuit of complete IF Amplifier**

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**Table of Values**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>R17, R18</td>
<td>2,200 ohms</td>
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<tr>
<td>R19</td>
<td>4,700 ohms</td>
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<tr>
<td>R20</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R21</td>
<td>240,000 ohms</td>
</tr>
<tr>
<td>R22</td>
<td>13,000 ohms</td>
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<tr>
<td>RV1</td>
<td>10K pre-set</td>
</tr>
<tr>
<td>C1</td>
<td>741 Op-Amp</td>
</tr>
<tr>
<td>R21</td>
<td>1N914</td>
</tr>
<tr>
<td>T1, T2</td>
<td>Denco 1FT. 13</td>
</tr>
<tr>
<td>T3</td>
<td>Half-inch ferrite ring core, Pri. 12 turns, Sec. 36 turns</td>
</tr>
<tr>
<td>Tr1, Tr2, Tr3, Tr4, Tr5, Tr6, Tr7</td>
<td>BC-108, or similar (see text)</td>
</tr>
</tbody>
</table>
pricking through with a compass point. A Radio-spar etch-resist pen was used to copy the connections on to the copper and the board etched in ferric chloride in the normal way. Because of the high gain of a circuit of this type other forms of construction are not recommended if instability is to be avoided.

Whilst the circuit shown gave first-class performance it may well be possible to improve its characteristics without altering the basic design. For instance, a lower noise figure might be obtained by using genuine RF transistors and running them at a lower collector current by increasing the total emitter resistance of Tr3 and Tr6. Also T3 could be dispensed with by replacing T2 with a Denco IFT 14. Although they are shown here in a 455 kHz application the amplifier stages have been used successfully up to 30 MHz.

EASY TOP BAND VERTICAL LAYOUT FOR RESTRICTED SPACE

F. G. RAYER, T.Eng. (CEI), A.I.R.E. (G3OGR)

A MOBILE aerial needs to be robust, reasonably compact, and it should be resonated at the favoured operating frequency. Much less stringent requirements apply to a fixed vertical used at a permanent location. The aerial described here is of the latter variety. It will not give better signal strength than a full quarter-wave Marconi, but will permit 160m. to be used in circumstances where there is no space for an extended wire aerial.

There is no need for trial adjustments to the loading coil or element lengths, as it is intended that final tuning should be at the transmitter, with the matching circuit provided here.

Short Verticals

Fig. 1 shows three vertical aerials. That at A has no loading coil, and would probably consist of a self-supporting alloy tube, though wire could be used if some top support were available. If this aerial could be quarter-wave long it could have excellent efficiency and no loading would be necessary. However, such a length is normally impossible on 160m., as the aerial would approach 130ft. high.

A shorter aerial must thus be used, as at B, with a loading coil to make up the electrical length. The vertical aerial could then be any length reasonably obtainable, the loading coil being adjusted to suit. This can give reasonable results, if the vertical is not too short in terms of a quarter-wave. With much shorter verticals, satisfactory results can be achieved, but radiation efficiency is not good.

Another method of loading is shown at C. Here, the loading coil is moved up the vertical aerial. This increases current in the lower portion under the coil, and hence radiation is improved. The aerial length and loading coil of C can be critically adjusted so that the system is resonant at the wanted frequency. The aerial can then be used with good efficiency on this and near frequencies, but will need re-adjustment for larger changes in frequency.

Another approach is to employ an aerial like C, but to make it somewhat short in terms of an electrical quarter-wave. An additional coil is then necessary, similar to B, but this can be at the transmitter, and can be situated for easy adjustment, to allow the whole system to be set up for any wanted frequency. This is the method employed in the easy 160m. vertical described.

With this further means of adjustment available (similar to coil B, Fig. 1) it will be realised that none of the dimensions or other details of the aerial construction are critical. They can, in fact, be varied through quite wide limits, without upsetting the whole system.

The 160m. Vertical

Fig. 2 is the whole system. The top is 4ft. long. L1 is 130 turns of 16g. rubber or plastic insulated wire, occupying 14in. winding length on a 1in. diameter former. The bottom section of the aerial is 9ft. 4in. long. It was fixed to a post to give a clearance of about 6ft. 6in. for the lead, to clear a path. The whole lead-in is 12ft. long, part of this descending inside the shack to the loading coil L2. The latter has 55 turns of 18g. wire, and

(cont'd p.369)
BRIEF SPECIFICATION

* Full VFO Coverage of 2 Metres. 144-146 MHz
* All Mode Operation AM, FM, USB, LSB, CW
* Power Output 10w. Minimum
* Dual Power Supply 240/120v. AC 50/60Hz AND 12-16v. DC

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- Compact, low current, reliable, with heater switch for mobile receive-only operation
- Built-in cooling fan
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- TUNE position increases tube life
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Superb selectivity and sensitivity (see tables below) makes the TS900 the last word for the discriminating amateur.

Receiver sensitivity (10dB S/N ratio) (measured in ARRL labs.)

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Sensitivity (micro volt)</th>
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</thead>
<tbody>
<tr>
<td>3.5 MHz</td>
<td>0.1</td>
</tr>
<tr>
<td>7.0 MHz</td>
<td>0.1</td>
</tr>
<tr>
<td>14.0 MHz</td>
<td>0.1</td>
</tr>
<tr>
<td>21.0 MHz</td>
<td>0.1</td>
</tr>
<tr>
<td>28.0 MHz</td>
<td>0.14</td>
</tr>
<tr>
<td>28.5 MHz</td>
<td>0.12</td>
</tr>
<tr>
<td>29.0 MHz</td>
<td>0.11</td>
</tr>
</tbody>
</table>

★ 300W, PEP input
★ LSB, USB, CW, RTTY (built-in crystal controlled RTTY generator)
★ 2.4 kHz SSB selectivity
★ All solid state except final stages
★ Noise blanker
★ Superb cross modulation characteristics
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THE FM MOBILE TRANSCEIVER

* 10W/1W output
* 23 channels plus VFO input
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Supplied complete with five channels:

- 145-50 Simplex
- 145-525 Simplex
- 145-55 Simplex
- 145-15/75 Duplex
- 145-175/775 Duplex

* Matching VFO (Tx and Rx) available
* Superb sensitivity and selectivity
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* 1W output from internal batteries
* Built-in charger
* Fitted with three channels as standard:

- 145-50 Simplex
- 145-55 Simplex
- 145-175/775 Duplex


PRICE: £80 (VAT exc.)
is 2 in. in diameter, the turns occupying 4 in. VC1 is 250 μF.

Construction

L1 was wound on a broom-handle. Two coats of shellac will keep out the wet and dry in a few minutes. A clearance hole to anchor the wire is drilled through about 2 in. from the top. The wire is passed through and plugged, and L1 is wound, and finished in the same way.

The top 4 ft. was some stiff ½ in. aluminium wire which was to hand, but ¼ in. to ½ in. or other alloy tubing would be better. The wood is centrally drilled to be a tight push fit for this top element. The top of L1 is connected to it. A tight clamp or terminal connection may be used. Soldering will require a large iron and aluminium solder such as Enthoven 071210. Alternatively, use Jubilee clips, well doped.

The bottom element is of large enough diameter to accommodate the considerable length of broom-handle at this end of L1, and a screw both prevents this slipping down to foul L1, and forms a connection from L1 to the tube.

A bottom fixing was made from a clamp cut from scrap metal folded round the tube and screwed to the post both sides, and also a projecting piece of wood forced into the bottom of the tube, and in turn screwed to the post. (The post was actually one corner of an out-building.) A screw attaches the lead-in, of 7/26 or other stout wire.

As mentioned, the whole is purposely less than an electrical quarter-wave, so that additional inductance can be used at the transmitter end, for convenient adjustment. As a result, any of the dimensions given can be varied, to suit the location, or items available. An increase in the length of elements, or mounting height, would be of advantage. Construction should be reasonably strong, though there is not much surface area presented to wind pressures. L1 can be bound with adhesive tape to keep out wet.

Matching

The system will not load the transmitter until the whole is adjusted to present a load within the range of transmitter adjustments available. Significant changes to the aerial might make it necessary to vary L2 from the details given. A surplus tapped or roller-coaster inductor would be excellent here. VC1 need not of course be the value mentioned, provided it is found to have enough capacitance when tuning up. The latter can be by any of the usual methods.

Should an RF ammeter be placed in the lead-in, tuning can be for maximum current, about 0.3 A to 0.4 A or so being expected with the usual Top Band transmitter.

With an SWR indicator in the co-axial lead from the Tx to L2, L2 ought to be adjustable as well as VC1. Otherwise, the system may load and appear to radiate satisfactorily with some impedance other than that intended presented to the Tx, and then SWR indications will be confusing.

When the PA “tune” and “load tuning” positions are known for 50-75 ohms or so, VC1 can be adjusted so that these take up somewhat similar settings.

The use of a field-strength meter or other methods could also be used. The setting for VC1 is fairly sharp. No doubt series-tuned and other ATU devices could be adjusted to give similar results, if preferred or to hand.

Earth

The desirability of a really good earth system for all end-fed aerials of this and similar type is well known. The ground lead may go to buried wires, earth spikes, or whatever form of radio earth is available.

GROUND-PLANE FOR TWO

Here is a description of a cheap and yet very efficient ground-plane antenna for 144 MHz, as used by PA0AKN, and described in CQ-PA for May. The drawing should be self-explanatory.

The length of the radials is 19 ins., or 48.2 cm., and the material is hard-drawn copper wire 2 mm. in diameter (say, 14 g.). The matching for a 72-ohm cable is achieved by bending the radials 45° below horizontal. For 50-ohm cable, this angle should be about 10°. An SWR bridge inserted in the feed cable enables the SWR to be brought towards the 1 : 1 ratio.

It is best to use as many radials as possible, with a minimum of three.

A.H.D.
THIS QSL BUSINESS — LETTERS FROM NEWCOMERS —

something on IAm Licences and Operating —

General News and Views — The Ladders

Our preamble this time is given to us on a plate, by way of a letter from G. J. S. Reading (Dartmouth) who has been both licensed amateur and SWL in DX countries and an SWL in various parts of the UK. He describes how he started sending SWL reports from MP4B-land and how it led him to involve with QRM MP4BDV contacts. He made it sit up and take notice to put it mildly.

His next move was to analyse what was wrong with these reports, and it became evident that, in the first place, SWL’s had to discard the prevalent idea of sending off a card to every station heard, in the hopes of building up a good collection quickly. Secondly, the attitude had to be cultivated of making sure that the report, from whatever country the SWL came, had to be useful, which in effect meant that it had to tell the recipient things he didn’t—and probably couldn’t—already know. For example, our correspondent started his own improved SWL technique by tackling V59MB. This station was followed for a whole week, end to end, and the system set up a page of reports, which when collated and sent off direct, resulted in a reply direct, with a letter of thanks and an invitation to visit should he ever be in the area.

The information to be obtained and noted on your report sheet should be along the following lines (it obviously will vary in detail as circumstances warrant): (1) Date of the band; look around and latch on to a weak DX signal. Note his degree of drift if any, and the extent of any such QSB. Check the rest of the band, and note the strength of other signals from the same area which may be coming through, likewise note the strength of the signals from those nearby countries which may be having a bad day, and latch on to a weak DX signal. Note his degree of drift if any, and the extent of any such QSB. 

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best way of checking the band is to note the frequency of the ten-meter beacon stations, listening for any signs of beacon signals. It will be noted that often when the band is open in the sense that the Mauritius beacon is clearly audible, there will still be no actual activity: this is the time for the transmitting amateur to speculate a CQ, something he would never do on a crowded band, and sometimes he will get a real prize back for it. This is the fascination of the band in its unexpectedness.

B. J. Macartney (Wokingham) is another of the Air Traffic Control types to become an SWL, with a Yaesu FR50B, to a long-wire and TA-33J—the neighbours thought he was daft to put up such an aerial and dafter still to want to rotate it! On queries, prefixes such as RA and SWL were the Romanian stations with VHF-only (they class 28 MHz as VHF) equivalent to UA3 and UP2, and so on. The assorted versions on the I-theme are parts of Italian territory; a fairly recent development on the old “I/I for everybody” to a system where the prefix gives some idea of location, the numeral being associated with the postal code of the town, corresponding to the second letter indicates which group of offshore islands one is hearing.

...G4BPM (Thetford) writes to set E. Parker (Hove) right about PI1ROS, which is a Dutch school station, Rijnlands Lyceum, Oegstgeest, near Leiden, with which the operators can improve their facility in languages. Being a school station it makes it of special interest to G4BPM who is himself a retired headmaster.

A slow-scan TV monitor is now in the shack of P. Barker (Sunderland) and he is making another activity of chasing awards while the bands are so dull at the moment, and he is also secretary of the local radio Club, which latter is a very effective way of keeping one off the air!

Although his tally of prefixes is only six this time, thanks to a spell in hospital and an operation, W. J. Hutchinson (Hornchurch) conspires himself with the thought that now he is once again convalescent but won’t be back to the salt-mine for a few weeks yet, he will be able to get a goodly crop for his next entry.

R. Holland (Malvern) writes approvingly of the article in the July Skillion, and even though he is hearing GB3SC at a low of 559 and often 561, he will get a real prize back for it. This is the fascination of the band and claimed OJOMR during the Christmas recess in 1969, probably the first time that Marker Reef was activated. On a different tack altogether, Maurice notes in his letter the dates and times of ten-meter openings observed from Harefield, which varied from 14:25 to nearly 20:00, and on average lasted about 30 minutes at a time. Seventeen metres was a dead bore and Twenty only middling, the revelation being that it will be almost a novelty to hear some W’s!

D. Sharred (Birmingham) queries whether SV1CH/C should be counted as a CI under the rules, or as an SV1. The question really is whether the prefix /C is used to indicate, for example that the station in question is other than a mainland Greek. However, the stations on, for example, Crete, do not sign in this fashion, and so we must fall back on the assumption that it is meaningless for HPX purposes; thus the calling sign as SV1U could be a CI.

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The question of a /MM signing from Region 1 has already been mentioned; but W. Bingham (Carriickfergus, Co. Antrim) has another angle on it, when he wants to know if G3SJM/MM/1 counts as a G11. No, Billy, and we have also, regretfully, to disallow your "LC1J" and "OQ7AA" although SJ9WL in Morokulien is quite OK.

More queries from R. C. Woolley (Ashbourne) who has L12A, SV1HC/A. And the first one from the departures list is genuine—one recalls L12B on the "Kon-Tiki" raft—but the writer has no knowledge of its antecedents. SV1HC we have already accounted for, and JY1GR is quite OK and pretty active.

DX on Forty is something few people have the courage to try for, but J. Cliss (Plummouth) found quite a lot of it on SW around 0630, such as VA, JA, ZL and so on, with W5 at the same time noted on Eighty.

Success in the May 1973 RAE was followed by a pass in the Morse Test, says A. W. McNeill (Newbury), with the result that all listening has stopped in favour of a crash programme of building—main and auxiliary PSUs, a five-band VFO, all completed, and the CC Tx for Eighty CW is well on the way. Congratulations to Mac, and soon we may hear him on the bands.

Not only does the computer print out his entry each month for R. Swan (London), but also it is made to produce a complete up-date of the overall list, generate statistics on QSL's, such as which is the best way to send them, which countries are the best at replying to reports, and so on, with normal business being allowed on to the machine in its idle moments.

Nice to hear again from J. R. Cowan (Rockford) who is now junior spark aboard the m/v. Donax, GSYU, and finding life is great. However, thanks to a labour dispute ashore he had been swinging round his hook off Anglesey for most of the week in which he wrote, and getting rather fed up with it.

M. J. Quinton (Rochester) philosophises in his letter on the need to pension off his Trio 9R-59, owing to its having developed a slow-motion drive to end 'em all thanks to a slipping drive-cord, after 7½ years at that! So, the old thing is to be put out to grass and the occasional BBC programme, and a FRM5B will take over the prefix task.

The advent of a Collins 75A-3 receiver has done things for the enthusiasm of M. F. Parry (Shrewsbury) and as a result more dipoles, Eighty. DX on Forty is something few people have the courage to try for, but J. Cliss (Plummouth) found quite a lot of it on SW around 0630, such as VA, JA, ZL and so on, with W5 at the same time noted on Eighty.

We nearly missed the letter from S. Sharred (Birmingham). This was because he switched his sheets round between a CW list and a Phone one, with the letter part hidden away in the middle! Top Band listening at the CW end has brought the score up quite a bit, with K25LSA, VPPLA, and VP2PEU heard; neither CFIUE or 9J2LF have delighted the Sharred ears; his total heard on 160m is now twenty-seven countries with fourteen of these confirmed.

S. Lawrence (Market Harborough) mentions hearing at S9 +40 a DL on Ten who was using only ten watts and has his doubts about the power input. The thing here to be remembered is that he may have been heard under a VHF-type propagation mode, and this may well account for the high received strength; indeed, if Ten is open in the normal way, one of the delights is the ability to get S9 reports worldwide with very low power, as old-timers will recall. On a different tack, he refers to hearing the S7YADA/AM mentioned by D. Sharred some time back, only in his case the chap was using 5YADA/AM. This operator is clearly using the aircraft call on the amateur bands quite frequently, and it is a surprise that it has not been stopped by the authorities ere now, as it has been going on at intervals for some years.

His attenuator is now working, reports K. Kyezor (Perivale) and getting fine results in the way of helping to hear the DX signals farther away.

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could count him as GW3 only, in addition to the G3. A. Buchman (Jamaica, N.Y., U.S.A.) is still, to his regret, awaiting his Joystick, ordered from the local agent back in April, although a batch of tuners have come through. Al has an interesting (and knotty!) point when he asks whether an F3/M/W2 counts as F3/M or W2/M? Whatever answer one gives it will only be an arbitrary one, so let us go for the letter of the rules and call this one a W2 mobile. Now watch the protests roll in!

How do the aeronautical mobile prefixes work? This query comes from S. McHugh (Ponsonford) who logged a station signing "SHMMT /AM" on July 17. Such stations, like another mentioned earlier, are not aeronautical mobile amateur callsigns in the strict sense but the calls of the aircraft. A true /AM license involves the holder in first of all having his normal station ticket, and the /AM license is normally simply a document varying the conditions of the normal ticket to permit aeronautical operations from an aircraft in flight on the amateur bands and using the station call /AM. There may also, as with /MM licences, be an element of "station licence" about it, whereby the authorities will inspect the proposed set-up before they will grant the /AM ticket, something that does not happen with a normal station; this inspection is to determine that the set-up will not cause QRM to the normal aircraft communications, electronics and electrical equipments, nor be a hazard in the aircraft in any other way, whereas the normal amateur station inspection is merely to establish that the station is up to scratch as far as the licence goes at the address on it, with no questions at all as to how it is hung together or whether the lights blink when the key goes down. However, countries giving /AM licences have no doubt their own ways of achieving the desired end; one suspects these chaps who use the aircraft callsign on the amateur bands are doing so because their licensing authority insists that for safety they must use the aircraft gear.

Two letters are in the pile from A. West (Herne Hill) as his first one missed the 'bus last time round. He has been listening on Ten, and as an example of what can be done, his SB-303 has found 61 countries on the band since April, including such short-skip as GW4 and PAO, as well as other continents. His main problem in the prefix line generally is now the Pacific area-join the club!- and with band conditions as they are, it looks like a continuing problem.

What a good early-morning band Forty is has now been acknowledged by R. H. McVey (Weston-super-Mare) after a session logging for Dad, G3GMC, during SSB Field Day from 0600-1000 when they knocked up 75 contacts; all that remains is to get up early enough one weekend to take advantage of the effect!

Others

Here we acknowledge those who have only sent in scores, or who mentioned nothing of general interest in their letters this time, as M. Cuckoo, Herne Bay; R. Cushing, Hove; the Gullises, Osbourne St. George; H. A. Lendersborough, Swanland; W. McFaul, Londonerry; M. Peters, Newbury; G. W. Raven, London, S.E.13; G. Richards, Aberdeen; E. W. Robinson, Bury St. Edmunds; M. Rodgers, Harwood; K. Salters, Newton Abbott; R. Shillcock, Kingswinford; W. H. Smyth, Harlepool; W. B. Taunton, Meopham; C. Verstage, Old Basing; A. K. Whitney, Castleford.

Final

And that about wraps up the parcel for this time. For next, the deadline will be September 19 arrival, addressed to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

**BOOSTER FOR THE FDK MULTI-2000**

**IMPROVING A TWO-METRE TRANSCEIVER**

W. H. Jarvis (GM8APX)

It has been found that the FDK Multi-2000, a two-metre transceiver with FM and SSB facilities, is an excellent piece of equipment, but for DX attempts from isolated and mountainous areas (such as the writer's QTH), a larger output and better sensitivity are necessary.

Telecommunications International Agency, Ltd. (Brockenhurst, Hants.) offer a beautifully constructed module by G8CQS, which boosts the power output to around 40w. p.e.p., and increases receiver gain by some 12 dB. This unit is actually designed to match the Liner-2, but fine results have been obtained with the Multi-2000; however, a slight modification is needed to the Liner or the 2000, so as to feed a small DC through the aerial output are sketched. R1 is 10K, allowing only about 1 mA of DC to reach the booster input; this switches on a single transistor which in turn operates the change-over relays in the booster.

R1 is also sufficiently high to minimise loading and detuning effects as far as the RF parts of the 2000 aerial filter circuit is concerned.

L1 and C1 might well prove to be unnecessary; they were added to make sure that none of the RF output got back into the other parts of the 2000 circuit. C1 is -0022 µF and L1 is two layers of 16 turns of insulated wire, an ad hoc choke found useful for discouraging RF over a wide range of frequencies.

As a devout "shamateur," as those of us who actually buy equipment are sometimes called, the writer has been very pleased to find two pieces of commercial gear, one Japanese and the other British, which work so happily together.

Turning to the innards of the booster, or "linear," it may be regarded as consisting of four sections: Inverter, PA, relay operating circuit, and mosfet preamp. The inverter uses two 2N3055's to produce 28v. for the PA. The PA consists of a 2N4128, and it will handle the 100% duty cycle of FM operation without ill effect; it is thoroughly "heat-sunk." The relay operating circuit has already been mentioned, and the mosfet preamp uses a BFS28 with diode protection at both ends.

Congratulations are due to the designer and maker. This unit can be recommended to anyone who, like the writer, enjoys his occasional DX attempts, but is very short of time for home construction.

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[Diagram showing the booster circuit with R1 and C1 highlighted]
VHF BANDS

A. H. DORMER—G3DAH

stations in the Stockholm area. The path was only open for a few minutes and nothing more was heard after 1630z.

The potenst signal during the splendid opening was probably that from HGSAIR in Mideast. He worked 55 G, 10 GW, two GI and GD, and one each F, SM.

Beacons & Balloons

G83VHF is back in service again on 144-15 MHz, and very welcome too. The electronic keyer is now giving excellent results after some initial troubles with RF getting into the logic circuits, and the new 50 watts output now seems to work well. G83VHF will be followed by a solid-state amplifier to bring the power up to some 40 watts.

Responsibility for the operation of the beacon is now with G3C0OJ.

During recent stormy weather, with much static about, the portable operating the PA of GB3SC has operated resulting in a very thin signals. GB3SC is now with G3COJ.

A CONSIDERABLE amount of correspondence has been received reporting the recent Sporadic-E and Auroral openings—

for which many thanks. Though space will not permit a detailed analysis here this correspondence has proved to be most useful and interesting.

The following notes may give some idea of the spread of the two phenomena.

2m. Aurora, July 6, 1974: In Anglesey, GW8FOL noted the start at 1430z and the finish at 1623z. He worked G, GW, GD and GM, but the signal faded outside the U.K. G4M4CX in Roxburgh, raised DL, PA and Southern G and GW between 1415z and 1638z. He also reports an aurora on July 23 between 1552z and 1715z during which he worked SM, GW and G, and heard OZ and DL.

G4DHF in Grimsby missed the start of the opening, but booked in GM8DBX and G8DML just before the band folded at 1630z. No second phase was observed. Down in Cheltenham, McCaugan logged Ar signals at 1500z and worked, during the next 50 minutes, into GM, GW, GD and G, all on SSB. Like GW8FOL, he heard nothing from outside the country. Optimum beam heard, and was due North the whole time.

G3JDXD (Grimsby) was another who made no contacts outside the U.K. Who worked HG and OK for two "Firsts," he made no contacts outside the U.K.

In Walsall, Staffs., G516AIR but could not complete the contact. Between 1206z and 1305z, GMJ3SZP (Glasgow) raised YU, DJ and OE with signal strengths up to 5 & 9 + 20 dB. In the same area, SWL Angrus MGF into YU at 5 & 9 + with an indoor 6-ele. beam! What might be a G1/OE1 "First" may have been set up by G4APW in Co. Antrim by his contact with OE1HNA at 1215z. GW8FOK (Anglesey) worked HG, OI and G1, and to a very good signal. Staffs.

The Swiss beacon on 2m., HB9TV, is now giving excellent results after some initial troubles with RF getting into the logic circuits, and the new 50 watts output now seems to work well. HB9TV will be followed by a solid-state amplifier to bring the power up to some 40 watts.

Responsibility for the operation of the beacon is now with G3C0OJ.

Several comments have been received about the non-reception of GB3SX in the Midlands. Initially, it was thought that the change in frequency (it is now 70-985 MHz) might have afforded the explanation, but this has been shown not to be the case. Operation is not continuous—there appears to be a random operating cycle, and this, too, might account for some of the reports. One begins to wonder, though, whether there may not be some sort of squint on the antenna since, in Herne Bay, the signal is almost always around the 599 mark, much better than formerly, and yet it is not designed to beam in this direction at all. Curiouser and curiouser!

G83VHF on 145-990 MHz is now back in operation. Reception of this beacon is a good indicator of Ar propagation, as it transmits to the NW for half its cycle.

The Swiss beacon on 2m., HB9SB, is now radiating on 144.125 MHz and has been heard at good strength outside the U.K. plus YU, OE, HA and DJ. G4CXL (Weybridge, Surrey) and G3BHF (Margate, Kent) worked YO, which seems to have eluded every one else.

For most observers, this spor-E event was over by about 1230z, but there seems to have been a short lift to the NE, probably tropo, but possibly associated with the Ecentre, later in the afternoon. GW8B8Q (Pembroke Dock), G3DY (Grimsby) and G30HT (Hull) all had contacts with SM
Reports: Conditions were average for the 432 MHz Open on July 21 and deteriorated as the event progressed. Two outstanding signals in the South-East were those from G1QAA/P (New Radnor) and G8AGU/P (Devon).

Propagation was good in the South for the 70 MHz affair on July 28 but very poor in the North. GM3Z5X mentions that GB3SU was at S3 during the weak proceeding the event and that it dropped to SOI during the contest. There’s Murphy for you! All British prefixes were available, two much sought after being GI4DBB/P and G3JWMR/P (Jersey). One of the best scores heard was that of GW3WRA/P in Brecon who was approaching the century mark towards the end of the event. There was an encouraging number of stations active, but it remains to be seen how many logs come in. The use of SSB was widespread, followed by CW, with AM/FM coming a poor third—another straw in the wind.

The 70 cm. Cumulatives seem to have got off to no more than an average start. Pity one of them did not occur on August 6, starting September 14 and ending September 29, 1296 MHz Cumulatives, October 5/6, UHF NFD.

VHF aerial system at G3DAH, mounted on a Strumech tower at a site 1200 ft. a.s.l. In ascending order, the beams are: 10-element for two metres; 14-element for Seventy-cems; three-element for four metres; and the new 34-ele for 23 centimetres. These radiators are on a 15-foot stub mast and the upper array is at 50ft. a.g.l.

**The Scottish Scene**

It was good to hear that the Sporadic-E opening of July 9 extended to North of the Border. It is often claimed, and justifiably so, that the Southerners get the best of this sort of propagation. To forestall the next Sassenach comment, what about all those aurorae you get and we don’t? GM8CFS (Peebles), about to repair to a convenient hostelry for a glass of lunch, switched on the "Liner-2" in the car to see if any of the locals would join him, and was delighted to have a 5 & 9 SSB contact with a YU. An unconfirmed report says that he really did enjoy his lunch, although the champagne bubbles made him sneeze! GM3AET (Kirkaldy) was another who made it with the YU. He also worked HA and heard some Russians. GM3JSZP (Glasgow) was alerted to the opening by the behaviour of the TV set and the QRN on Band II, made it with three YU, one DJ7 and two OE. Nice going!

SSB on 2m. continues to increase in the Edinburgh area. Known newcomers are GM3OWU, GM3XZE, GM4DG, GM4FL, GM4BJE, GM8AIP and GM8EKF. Great credit is due to young Ross, GM4CLH, who is emitting such a clean signal from his H-B transverter. GM8DJ has also produced his own transverter to work with the new FT-550. A few octaves up from 2m., George Burt, GM30XX, has an SSB rig under construction for use on his 3 cm. portable forays.

There is now an active net on 4m. in Edinburgh and district with GM3OWU and GM3BQA QRV on this band. GM8DJ (Edinburgh) continues to plough a lonely furrow on 70 cm. and is persisting with his one-man activity night on Tuesdays, on the hour between 1900 and 2100 BST, but getting few takers. He was delighted to work Paul Widger, operating as GM8AGU/P on his recent trip.

VHF interests should be well catered for...
### THREE BAND ANNUAL TABLE
#### TWO METRES
**January to December, 1974**

<table>
<thead>
<tr>
<th>Station</th>
<th>Counties</th>
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<td>GW8FQOL</td>
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<tr>
<td>G1XDY</td>
<td>70</td>
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<td>G2DAH</td>
<td>62</td>
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<tr>
<td>G4AGE</td>
<td>63</td>
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<tr>
<td>G5DF</td>
<td>58</td>
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<tr>
<td>GW3KGD</td>
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<tr>
<td>G8GZ</td>
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| Total   | 131  |

### THREE BAND ANNUAL TABLE
#### FOUR METRES
**January to December, 1974**

<table>
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<tr>
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<th>Counties</th>
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<td>G8M2BE</td>
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<tr>
<td>G4AEZ</td>
<td>11</td>
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</tbody>
</table>

| Total   | 117  |

The Welsh Amateur Radio Convention takes place on Saturday, September 28 in the Tower Block Building of the University of Dundee. The subsequent Dinner is to be held at the nearby Angus Hotel. As customary at these affairs, a series of lectures has been arranged, and GM30XX and GM3DJX, who have been breaking the U.K. 3 cm. records recently, will be demonstrating the gear they used. For the Convention only, the cost is £40, for the Dinner only, £2 and for both £2-25. Overnight accommodation can be arranged at £2-60 per night for bed and breakfast. Ampie parking space is available and G4M8IP will provide talk-in. Tickets, and further information available from Frank Hall, GM8BZK, QTHR. See you there.

The Scottish VHF Convention takes place on Saturday, September 28 in the Tower Block Building of the University of Dundee. The subsequent Dinner is to be held at the nearby Angus Hotel. As customary at these affairs, a series of lectures has been arranged, and GM30XX and GM3DJX, who have been breaking the U.K. 3 cm. records recently, will be demonstrating the gear they used. For the Convention only, the cost is £40, for the Dinner only, £2 and for both £2-25. Overnight accommodation can be arranged at £2-60 per night for bed and breakfast. Ampie parking space is available and G4M8IP will provide talk-in. Tickets, and further information available from Frank Hall, GM8BZK, QTHR. See you there.

The Welsh Amateur Radio Convention is scheduled for Sunday, September 22 at Community College, Oakdale, near Blackwood, Gwent (ex-Monmouth). Time is 1000 to 1800 BST and talk-in is available on 80m. and 2m. (GW6GCW and GW3WTZ/A respectively). They will also be using the Bristol Channel repeater, GB3BC, for long-haul talk-in. The programme includes lectures and trade show and further information may be obtained from G4WBE, QTHR.

Group/Club Activities
The U.K. FM Group (Northern) will be participating in the 1974 VHF NFD under the call GB3FM. The location of the station will be very close to the site of the proposed Northern repeater (GB3NA) near Barnsley, and will use comparable gear. It is anticipated, therefore, that some indication will be given of the possible coverage of the repeater. They will transmit FM but will be able to receive all modes on two metres, the only band that will use, and will welcome reports on contacts, which will be acknowledged by special QSL card.

The Southampton Group have arranged a Convention for Saturday, September 21, 2 p.m.—8 p.m. at the Southampton College of Art, East Park Terrace, College of Technology. A series of lectures has been arranged, and trade stands have been organised. Admission is 50p. Further details, programmes and tickets from G8CEH, QTHR.

The next meeting of the South-East VHF/UHF Group is on October 11, when Jack Brookner, G3JMB, will be talking about electronics and mechanisation in the Post Office. Venue as usual is the Electronics Building Lecture Theatre, University of Kent, Canterbury.

R.A.F. Zeeland now have the callsign GW8ITZ and are planning to operate from Kintyre during VHF NFD. Changes of personnel have kept this once very active Club dormant for quite a time now, but thanks to the efforts of GW8AA, G3NHE, G3LAI and GW8DEZ it looks as if we can expect activity from them on 2m, 70 cm. and 3 cm. in the not too distant future. How about 4m?

**VHFCC Awards**

G8DSP (Anfield, Liverpool) gains Award No. 222 this month with a 2m. claim. Stan Collier first became interested in Amateur Radio as an SWL in 1956 and took the R.A.E. in 1959. Business kept him off the air until June, 1970 when he obtained his present call. At that time he ran a Pye 2002 and R.215, but subsequently graduated to an 832, an Edystone 680, an 8-ele. Yagi and a Microwave Modules converter. He was relatively inactive during 1972/3, but a Christmas present of a “Liner-2” from his wife revitalised him, and he is now to be heard regularly on the band.

Geoff Black operates on 2m. as G8HPD in Wheathampstead, Herts., and since August, 1973, when he first came on the band, has managed to get the 100 cards required for the Award with a 50% return rate. The equipment in use is a Heathkit SB-303, which replaced the original Trio JR-500SE, with a dual-gate mosfet converter. The transmitter runs 8 watts of plate-modulated RF to a QQVO3-10 in the final and the antenna is an 8/8 slot at 375ft. a.s.l. and 35ft. a.g.l. Plans are in hand for 70 cm. and 3 cm. in the not too distant future. How about 4m?

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started up, and the current version is a 4 x 5 element array installed in the roof space, with a forward gain of 14 dB over a reference dipole. He intends to dispose of all his FM gear and go for a TS-700, which will be operated both at the home QTH and from I/P locations. The QTH is 437ft. a.s.l. with a good take-off in all directions, but with Winter Hill only some four miles away, there is heavy QRM during contests when the visiting groups get busy!

We are pleased to issue Seventycem Award No. 17 to Martin Dann, G3NHE, who operated from Sheffield on the 430 MHz band. This pairs up with Award No. 142 issued in November, 1971 for his 2m. work, and he is now collecting the requisite number of cards for the 4m. Award. Most of his contacts were made on FM with a '3-20A tripler giving five watts RF into a 46-ele. Multibeam, initially at 35ft. but now at 44ft. with a remarkable improvement on results. The AF239 pre-amp precedes a bi-polar front-end converter into an AR88. The site, at 425ft. a.s.l. is good except to the South-West, where a water tower at 100 yds. spoils things a bit. Martin now has SSB on 70 cm. and, although running low power, puts a good signal into the South-East.

**News Items**

Two Metres: Good to hear GSYV of Leeds back on the 2m. air again, this time with SSB. He was very active on the band in 1949/50 when it was first released to us, and the G3DAH log for those years contains many entries for CW contacts with him. G8HQY (Shrewsbury) is looking for regular two-metre skeds on SSB with stations over 100 miles from his QTH, with the idea of doing some propagation investigations. QTH: 3 Cruckton Close, Shrewsbury, Salop. Wish we could get a little more 4-metre activity from that county!

From a correspondent who shall remain anonymous: "Heard on 2m. SSB the other morning—I've got a birdie that comes out slap on the FM channel, hi, hi, but I'm not bothered about in-band radiation, hi, hi! Perhaps he should be hung, high, high!". No further comment!

GM1ZBE reports a good tropo. opening on the band on July 24 with the axis definitely N/S, but with a bit for transmission from the North. Both he and GM6FJFX were giving poorer reports than they were getting. He worked numerous G stations as well as PA, ON (mobile), OZ, F and various DL.

One would like to see an investigation into this "one-way propagation" phenomenon which occurs far more frequently than one would expect. Alec comments on the good operating practices of most G stations during the "pile-ups" on his frequency, but is not too happy about the chap who says "Please look for my friend who is running one watt to a roof-space halo down in the valley" while there is a queue waiting for him. Point taken? He hopes to be up on 70 cm. and 23 cm. before too long, and for the next eight weeks he will be monitoring 70-2 MHz, beaming South, between 1900z and 2200z on Monday evenings.

G3PBE, Reigate, Surrey, reports a good opening into HB9 early on the morning of July 22. He accessed the Swiss repeater (HB9F) and worked nine HB9 (three of them mobiles) and several DL/DJ. This device accepts input on 145-1 MHz and transmits on 145-7 MHz, and apparently no tone-burst is required. This one is worth watching! The pirates are about again! G8BNO reports receiving QSL cards for contacts he has never made. He would be grateful if anyone who has "worked him" during April, 1974 would get in touch (QTH, p.94 April issue).

Seventy centimetres: G3NHE (Sheffield) finds that conditions have got to be really flat before it becomes impossible to work stations on SSB or CW at 150 miles plus. Your scribe must agree with this statement and draw attention once again to the desirability of calling into what may seem to be dead band. Over and over again, one learns of chaps who say "I spend as much, or more, time listening as I do transmitting" and that being the case, a QO call has a good chance of resulting in a contact. The old comment "Use or Lose" is still very appropriate for this band.

G3BW in Cumberland (Cumbria) is now QRV on 70 cm. with a 320A in the final and a Microwave Modules converter. He finds the going a bit of a slog from his rather remote QTH and is planning to increase power with a 4CX250B final which is now just out of the drawing board stage. This is still a difficult county for the Southerners, so it is worth while having a look for Bill's SSB around 432.2 MHz.

**Deadline**

Please send your news, views, claims and comments to "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ by September 6, latest. Cheers for now and 73 de G3DAH.

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**B.A.T.C. CONVENTION**

This year's British Amateur Television Club annual meeting will be on September 28, 10.30 a.m. to 6.30 p.m. at the Benn Memorial Hall, Newbold Road, Rugby, on the A.426, from Junc. 20 on the M.1. Ample free parking adjacent to the Hall. There are hourly trains from Euston, also from Birmingham, Liverpool, Carlisle and Glasgow to Rugby Midland station, within 10 minutes walk of the Hall. Those arriving for the convention by train can ring Rugby 3321 for transport on arrival (from the box on the station) if the Wx is really too bad to walk it. The programme includes the B.A.T.C. AGM, an exhibition of members' A/TV equipment, and discussion groups on the subject of A/TV—which means the transmission and reception of television on the 430 MHz amateur band. Further details from the hon. secretary, J. J. Rose, G6STO/T, QTHR.

"SIMPLE LINEAR AMPLIFIER"—Correction Note

We have been informed by G3SZC, author of the article "Simple Linear RF Amplifier" in the August issue, that he should have shown C16 (across D2, to the left of the diagram) at 1000 µF, 40V. working, and that the bias voltmeter is connected across points A-B after R5; it should read almost zero with 1250V. on the plates of the PL509's.

There has been some criticism by the purists about the use of PL509 line-output valves at all in this con-configuration—but this disapproval has been voiced ever since line-output valves were first suggested for amateur RF amplifiers. However, a cogent point made by GW8DXA (Cardigan) is that a resistor made up to 167 ohms and rated 20 watts should be included in the series heater circuit D1, R6 to keep the applied voltage around 120V. His point is that with the circuit as shown on p.312, August, the PL509's could be heavily over-run on their heaters.

Yet, according to G3SZC, they have been working happily for years in the circuit he is using.

**NEW HEATHKIT CATALOGUE**

Anyone wishing to be right up-to-date with what is happening, or what is possible, in the home-construction field as regards Amateur Radio (and much else in the way of electronic equipment) should have the latest Heathkit catalogue. Of course, the Heath kits have been available for many years—with the so-well-presented box-of-parts and the accompanying lucid and well-written constructional manual. There must be 1000's reading this piece who already have bits of Heathkit gear—whether transmitters, receivers or the ancillaries that go to make up a fully operational Amateur Radio station. For a free copy of this new catalogue, write: Heath (Gloucester), Ltd., Bristol Road, Gloucester, GL2 6EE.
THE MONTH WITH THE CLUB

By "Club Secretary"

(Deadline for October issue: September 6)

The time for MCC is coming round again. This year's event, the 29th in a row, will change the name of the "North" section to make one less, and will take place over the week-end November 16-17. The Radio Society, as last year, will be published in the October issue, due out on September 27.

They are a reticent lot up North! For long enough we have regarded Derby as the Midlands, but put them in the "North" section to make one less. Little or nothing in the way of news has come from GM for months, although we know they are active and doing things, so it was quite a surprise this month to see two reports from Scotland—but there must be twenty or more Clubs in GM—whatever do they do with themselves?

Southern Reports

Bishops Stortford recently gave your conductor a prize rocket for not mentioning them occasionally in this piece. This group has a place at the British Legion Club, Windhill, where they can gather on the third Monday of each month, first the morning meeting in the bar downstairs, and later for the formal meeting and lecture in the room set aside for them upstairs.

The winter session of the Shebborough Youth Centre radio group is down for September 2, and from then on, on Mondays and Thursdays, the HG, centre being in the Garden Road, Maidenhead, on the third Thursday for the ragchew; both are at the Eltham United Reformed Church Hall, 1 Court Road, London, S.E.9.

Even when he is away on holiday, the Maidenhead secretary gets his report in on the dot—more credit to him. He says they have a place at the British Legion Hall, The Crescent, Maidenhead, on the first Thursday and the third Monday. September 15 sees a session of Any Questions, especially for newcomers; they compete in VHF/NFD over the weekend September 19; and then on September 17 there is G3VXZ to talk about and demonstrate Slow Scan TV.

By "Club Secretary"

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For more years than one cares to think of, the same hand has written the Newsletter and been the secretary for Crystal Palace, which longevity seems to be a sure recipe for success for a group, in Amateur Radio. The HQ is at the Market Hall, St. Albans. The winter session of the Shelburne Young Farmers is back to normal, but an article on a two-metre VHF transceiver project, an installment of their thriller, a cartoon, humour, and a list of Club crystals available for sale to members. We see that over August while Marie Place (their HQ in Burgess Hill has been closed) they have been meeting at alternate Fridays are booked for West Kent activities, with September 6 and 20, October 4 and 18 noted particularly, at the Adult Education Centre, Monson Road, Tunbridge Wells, although no details are given as to the activities. Information from the secretary, see Panel.

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West Counties

That head was going to be West Countries, until we realised, at the last moment, we had nothing from GI!

So to Plymouth where the compiler of their Newsletter would seem to have at his command quite the most temperamental duplicator in the field—however, the contents of QUA are well worth the struggle to read most months. It is first and third Tuesdays in each month, at the Club Hq., Virginia House, Bretonside, located at the rear of the Breton Arms, Buckwell Street, and near St. Andrew's roundabout—and, once found, the visitor or attending member is assured of a West Country welcome.

At Yeovil they find time to get together every week, XYL's or no, at the Youth Centre, 31 The Park. For more details, contact G3NOF, at the address in the Panel.

Basic Radar is the topic for Cornish on September 5. The speaker being G4CEH. The Hq. is at the SWEB clubroom, Pool, Camborne. However, looking a little ahead, we notice that the venue for October's meeting, on the 3rd, is changed, just for this once, to be at the Cornwall Technical College.

Now to Torbay and the hon. secretary reports that the group still progresses, the main pre-occupation having been the Mobile Rally preparations. RAE classes kick off on October 1, with the enrolment down for the second week of September. For more details of this Club, where they have visitors during the holiday season, we suggest you contact the hon. secretary—see Panel, overleaf.

One was a little doubtful about including the next two in the Westerly clip, but here goes: Hereford have a place at the Civil Defence Hq., Gaol Street, where they assemble on the first and third Fridays in the month. Incidentally this is another group who have managed to fix up an RAE class, at the Hereford Technical College, given enough enrolments—September 2-5 are the enrolment dates.

Pre-designed Top Band Transmitters are to be built by the members of Shirehampton (Bristol) who have just obtained their RAE passes—one hopes it will engender a liking for this facet of Amateur Radio. The lads can be located on any Friday at Twyford House, High Street, Shirehampton.

Midlands Area

Always a difficult area of the country to define, and our very first letter caused us to think more on the subject before finally placing it in this pile; Warrington, who have a very orderly scribe who puts things just as we would like them, even if we do have some difficulty in reading his "fast!" The meetings are on Tuesdays, at 8.0 p.m., the venue being the Thames Board Club, Manchester Road. On September 1 they have a Mini-Rally—it sounds rather like the real thing to us!—at Peninsula Barracks, Warrington, including as it does trade stands, amateur TV, talk-in stations, an antique radio display, Club stands, amusements for the XYL and harmonics, and much else. As for the programme for the normal weekly sessions, while no specific dates are given, the activities promised sound as though someone is doing a mighty lot of work organising things—Good!

No argument about Bromsgrove, who now get together at Avoncroft Art Centre—this seems to be a change from the last time they wrote—where they can be found on the second Friday in every month. For September this makes the 13th, and the talk will be about Satellites, by G3HAZ. Visitors are specifically mentioned as being welcome.

There was recently an AGM at Stratford-on-Avon which reflects the change of secretary quoted in the Panel. We also notice a change of Hq. here, to be the College of Further Education, Alcester Road, at which spot they get together on alternate Fridays.

Coventry will be amusing themselves by going on the air on September 13 and 27. On the 6th, there is a "University Challenge" type of Quiz to be played off: Easier questions maybe, but the same system of inter-linked push-buttons all done electronically, just like the real thing. There is, of course, the matter of VHF/NFD (mentioned so often this month that to repeat the dates would be wearisome) and on September 20 comes a Hi-Fi demonstration. It all boils down, basically, to a case of every Friday evening, at Baden-Powell House, St. Nicholas' Street, Radford Road.

If you are in Blackburn, on the first Thursday of the month, why don't you look in on the East Lanes chaps? They are to be found at the YMCA, Sheerbank Road. Although we don't have any details for September, we notice on October 3 a talk and demonstration of radio control of models, and in November a Show of members' radio rooms. During September there is also VHF/NFD, which, it is hoped, will be taken from Billinge Hill, Blackburn, with a caravan from which to operate.

Effectively it is a question of every Tuesday at Bury & Rossendale—the formal meeting is on the second Tuesday, but the lads are to be found at Hq., nattering, every other Tuesday. The Hq. is at the Mosses Community Centre, Cecil Street, Bury, where, during September, the RAE classes will once again make a start. An interesting thought for other groups is that this crew have a "stand committee" whose task is to seek out and put on a stand at any local exhibitions which may be opportune; the benefit is quite measurable in terms of new members found.

At South Manchester there is always plenty to do; they must have easy-going wives in that part of the country! The main meetings are at Sale Moor Community Centre, Norris Road, Sale, each Friday. On

THE 29th M C C

This will take place over the week-end November 16-17. Rules in the October issue and to be much as last year.
September 6 they have a mini-lecture contest, followed by a Sale of Surplus Equipment on the 13th, non-members welcome. Three members get together on September 20 to fix up a demonstration of Leak and Wharfendale Hi-Fi, and on September 27 G4BHT talks about Chemical Energy. On top of all this, the VHF and the D/F contingent also have Monday evening meetings at the Club Shack, Greeda, Shady Lane, Manchester 23.

Thursday, September 5, will see the finale, in more ways than one, of Dick Sutton’s series of colour TV talks given to the Cheltenham folk at the Royal Crescent Hotel, Clarence Street, as he is emigrating to Australia. On a different tack, the labs seem to have had “adventures” during their June Field Day with PSU’s and generators playing up, to spoil an otherwise very successful event.

It is traditional for Wirral to have a Fox Hunt for the August meeting, and this year, to stop the chairman winning they elected him to be the fox! Meetings are on the first and third Wednesdays, at the Sports Centre, Grange Road West, Birkenhead, and in addition to these, on September 1 there is the Radio Exhibition at Warrington; VHF/NFD will be entered; and over the weekend September 14/15 some of the labs will doubtless be going to the Lancaster University OIM.

For VHF/NFD the Solihull chaps seem to have dropped out, as they are having a camping weekend, operating Top Band, and the following day evening at the “Glovers Needle” in Worcester, travelling there in a coach leaving Solihull Civic Car Park at 7.30; and the following day visitors will also be welcome. Then on the 13th, they have a social meeting, operating Top Band, Eighty and VHF/NFD will be entered; and over the weekend September 14/15 these, on September 1 there is the Radio Exhibition at Warrington; VHF/NFD will be entered; and over the weekend September 14/15 some of the labs will doubtless be going to the Lancaster University OIM.

The Hq. address is at the Manor House, High Street, Solihull.

NORTH & SCOTLAND

Another of their mammoth Junk Sales falls to be mentioned for Clubs interested, says G3MDW of Northern Heights to whom applications should go—see Panel for his address. For 15 years now Arthur Has has been arranging the programme for the Northern Heights chaps and begins to find it tough going—beats old scribe how he keeps it up! September 4 is down for a committee meeting, the 11th is set aside for a talk on a visit to U.S.A., and on the 25th there will be a talk on Slow Scan TV.

Our first trip north of the Border for many moons takes us to Mid-Lanark, who are at Wrangholm Hall Community Centre every Friday evening, the routine being to alternate between a week of “formal” stuff, film show, lecture, or whatever, and a week of nattering, Morse practice and operating the Club station, the while the catering does a roaring trade—thirsty work, nattering and punching a key! In addition, RAE classes start in September, weekly on Wednesdays. For more detail, contact GM3KMG, as in Panel.

The secretary at York is finding so much to do that he is pufing...
The well-known Scottish Club group, Glenrothes, put in an entry for this year's Field Day signing GM3YOR/P, making a total claimed score of 2396 points. In the picture are, left, GM3POF, with GM4ALK. They report conditions as having been not too good, but some reasonable DX was worked.

a little as he writes! The summer is, and has been, full of outside activities for the crowd—"showing the flag" at various shows, operating at G3HWW/A, G3XFM/A, and GB3TS (at Tollerton Horticultural Show, last). As far as the clubroom is concerned, there are enough talks and activities fixed up to keep them going handsomely through to the Annual Dinner on October 25. The Hq. is at the British Legion, 61 Micklelegate, and if you want to know more, then we refer you to G3WVO, in the Secretaries' Panel.

Derby were quite determined to be in the Midlands group, but sadly we had to draw the line a bit South of them so they are, for our purposes, Northerners—anyway, everything North of Watford is "Injun territory" to this scribe! Seriously, this is a very active and long-lived Club, getting together weekly at 119 Green Lane, Derby. September 4 is a Surplus Sale, September 11 sees someone talking about Low Definition Television and on September 18 there is a D/F Practice Night. Then on the 25th there is a Film Show, while on Sunday, 29th, comes the D/F final for the president's cup, details on which are obtainable from G2CVV, as Panel opposite.

Back to Scotland we go, up to Lothians, where a new secretary has taken over and been instructed to report. They start the winter session on September 12 with a presidential address, followed on September 26 by a Junk Sale, and October 10 by GM8FM talking about Repeaters. All these second and fourth Thursdays are taken at Room 7, Riddles Court, High Street, Edinburgh, from 7.0 p.m. on for a formal 7.30 start.

Another University opening now, this time Durham, where it is proposed to start a radio club and to have the call G4DUR reserved for it. Anyone interested should get in touch with G4BBU, either at the address shown in the Panel, or, during term-time, c/o St. Chad's College, South Bailey, Durham. Let us hope the proposal meets with every success.

Sunderland will be at the R.A.F. Association Club, Merton Street, near the multi-storey car park, on September 3, to make preparations for their 80-metre Field Day, and on September 17 for a talk by G2BS on Miniature Transmitters and Receivers. They then move back to their normal home, Sunderland Polytechnic, for October 1, when G3YJG will talk about Tape Recording for the Amateur, and on the 12th, September 26 for VHF/NFD preparation, September 13 for a Model Railway Night and the start of RAE classes, September 20 for G1RDM to talk about Tape Recording for the Amateur, and on the 27th "Getting Ready for the Morse Test"—and what better objective to couple with an RAE class?

Help!

R.A.F.A.R.S. recently had a letter from a blinded ex-R.A.F. warrant officer and they are anxious to get in touch with the W.O. who unfortunately did not give an address. However, it is known that he has been lent a receiver by someone. Thus, would anyone who did lend an Eddystone S640 Receiver to a blinded Mr. E. P. Williams please contact the R.A.F.A.R.S.—see Panel—or, alternatively, write to your scribe at the address in the final paragraph of this piece, and he will do the rest. And, even if you did lend this receiver yourself, if there is anyone you know who owns one, ask him if he has lent it out, and if it is him, again let us know, regardless of whether he is a reader or not. Thanks!

Having mentioned the Royal Air Force in the previous paragraph, we may as well continue with the other non-local associations, first among whom this month is A.R.M.S., who cater for the M enthusiasts anywhere in the world—this month they announce a new member in DJOYD/M. The Independent Order of Oddfellows now have a "Ham Club," as they choose to call it, with nets held on 14273 kHz on Sundays at noon GMT, Tuesdays and Wednesdays at 2015z—G3YJS seems to be the spark-plug in this country, and his address therefore appears in the Panel.

Finally, R.A.I.B.C. catering for the invalid and bedfast radio amateur or SWL. For years we have been noting how much G3LWY used to put into running the Club, and it looks as though G3XN and his XYL, who have taken over the chores of the Club, are following well in her footsteps. If you know anyone interested in radio and invalid or bedfast, then get him signed up; and while you're about it, sign up yourself as a supporter, always wanted to help with transport and visiting.

Conclusion

We seem to have come to the bottom of the pile. Now think on to next time, when your news should be of the October doings, and send it all to reach here on September 6 latest, addressed always to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-IRQ.
COURSES FOR THE R.A.E.

Second List

Following are the R.A.E. Courses notified since publication of our first list on p.314 of the August issue of SHORT WAVE MAGAZINE.

Additionally to the general information given there about Subject No. 765—which those who contemplate taking a course of instruction for the advanced amateur licence should note—it ought also to be mentioned that, if your locality is not covered in the List given here or on p.314, August, you may be able to get information from the local office of your Education Authority. Generally speaking, these courses come under the Local Education Authority plans for Further Education, so that fees are nominal—but usually a certain minimum number of students (12-15) is required to justify establishing a course. This number can, in many cases, be recruited through Radio Clubs in the area or by local press advertising.

When making enquiries, always quote “Subject No. 765, City & Guilds of London Institute.” Please do not address enquiries to us, as we are unable to reply in the point being that we know only about the courses notified to the Magazine for publication, as listed here.

Amersham: At the College of Further Education, Stanley Hill, also with Morse tuition if required. For details, ring Amersham 21121, Ext. 27.

Ballymena, Co. Antrim: Commencing mid-September at the Technical College, Groucott, GW3YTJ, QTHR.

Bangor, Co. Down: At the Technical College, two evenings a week, starting mid-September, with E. Eldson, G3YUQ, QTHR.

Barry, Glam.: At the College of Further Education, Colcot Road, telephone Holywood 4277.

Barry, Glam.: At the College of Further Education, Colcot Road, classes in Theory, Morse and practical work, starting Tuesday, September 24, and Thursday, 26th, 7:00-9:00 p.m. Fee for course £5-25, enrolment September 16-18. An all-band amateur station available for students. Further details from D. H. Adams, GW3VBP, at the College.

Bedford: At Westfield School, Queens Park, commencing mid-September, on Wednesday evenings, 7:00-9:00 p.m. Full details from course tutor, E. Eldson, G3YUQ, QTHR.

Boreham Wood, Herts.: At the College of Further Education, Elstree Way, on Wednesdays, 7:00-9:15 p.m., starting on September 18, enrolment September 4-5, evenings, at the College. Lecturer G. L. Benbow, G3HB.

Bradford: On Monday evenings, at the Technical College, Great Horton Road, with N. Short, G3YEE (QTHR, telephone Bradford 664220) as instructor, or apply at College.

Bridgend, Glam.: At the Technical College, on Wednesday evenings, 6:00-9:00 p.m. Details from B. Jones, GW3WRE, QTHR.

Bristol (Shirehampton): Theory and Morse at Shirehampton Amateur Radio Club, Twyford House, commencing late September. For details of enrolment and dates apply as soon as possible to R. Andrews, G4GBW, QTHR.

Burton-on-Trent: At Rolleston Evening Institute, Needwood School, on Tuesdays, 7:00-9:30 p.m., starting on September 17. Further details from the Institute (Mr. Smith), telephone Burton 812333, or from the course tutor, R. I. Buckby, G3VGO, QTHR, 'phone Derby 672245.

Canterbury: At the College of Technology, course lecturer D. J. Bradford, G3LCK. Enquiries to him, QTHR, or at the College.

Dudley: At the Technical College, enrolment September 2, at the College.

Dundee: At the Kingsley Technical College, Old Glamis Road, first class on September 5, 6:30-9:00 p.m. Enrol at class or call at College. Further details from D. Coupar, GM3YVX, QTHR, or ring Dundee 72054.

Durham: At the Technical College, Framwellgate Moor, commencing in September, Theory and Morse, Fridays 6:30-9:30 p.m. with F. L. Firth, G8JD, as course tutor. Enquiries to Head of Engineering Dept., at the College.

Farnborough: First class on October 3, 7:30 p.m., at Cove County Secondary School, St. John's Road. A course in Morse will also be available. Apply to the Principal, Further Education Centre, at the School.

Glasgow: At the College of Nautical Studies, 21 Thistle Street, on Tuesdays and Thursdays, 7:00-9:30 p.m., commencing September 10. Fee £3 00, payable on enrolment, on opening evening. This is a full course, covering Theory, license conditions and Morse, with no prior knowledge assumed or required.

Gosforth, Northumberland: Starting in September, at the Secondary School, North Road, on Tuesday and Wednesday evenings, weekly. Course tutor D. R. Loveday, G3FPE. Prospectus and further information from the Principal, at the School.

Grantham: At St. Hugh's School, on Mondays at 6:45 p.m., starting on September 16. Enrol at the class. Instructor A. Ellis, G3PJR.

Hearns, Derbys.: At the College of Further Education, Ilkeston Road, on Wednesday evenings (Theory) and Thursday (Practical), commencing September 18, enrolment at the College, evenings September 4-5.

Horsforth, Leeds: At Airedale & Wharfedale College of Further Education, Calverly Lane, Horsforth, on Wednesday evenings. Course tutor, R. Short, G3YEE, QTHR. Also at this College, on Thursday evenings, Morse tuition and advanced Amateur Radio course, with fully-equipped amateur-band station, workshop and test gear. Course tutor G. Denby, G3FCW, QTHR.

Kirkcaldy: At the Technical College, St. Brycedale Avenue, Theory and Morse classes starting in September. For details apply Principal, at the College, or H. Cook, GM6FXZ, QTHR.

Lincoln: At the College of Technology, Cathedral Street, enrolment September 9-10, at the College. Instructor R. Goodchild, G4CIL, telephone Lincoln 30641.

London (Acton): At the Technical College, High Street, on Wednesdays, 6:30-9:00 p.m., commencing September 25, enrolment September 5-10.

London (Battersea): At the Adult Education Institute, Latchmere Road, Lavender Hill, within three minutes Clapham Junction Station, every Thursday evening, 7:00-10:00 p.m., enrolment week commencing September 16, any evening. Course instructor, D. Shepherd, G3YNP, QTHR.

London (Highgate): At Highmore School, Highgate, N.19, lectures starting September 23, 7:00-10:00 p.m., enrolment week beginning September 16, 7:00-9:00 p.m., at the School. Tutor B. C. Bond, G3ZKE.

London (Ilford): At the Evening Institute, Cranbrook Road, starting September 25, enrolment September 9-12, 7:00-8:30 p.m., at the Institute, fee £3 00, or £1-50 for juniors. Tutor, W. G. Hall, G8JM, who has been running this Course very successfully for many years.

London (Wembley): At the Evening Institute, Copland School, Cecil Avenue, basic fee £3-00, with reductions in suitable cases. Course starts September 16, 7:00-10:00 p.m., in two sections, Morse and Theory. Enrolment September 9-11, evenings. Main requirement in students is enthusiasm for Amateur Radio, no previous knowledge being necessary. Further enquiries welcomed by I. Bayliss, G8CZO, QTHR (telephone West Drayton 81-4728). This course was started by A. J. Bayliss, G8PD, many years ago, and has always been most successful.

Loughborough: At the Technical College, Radmore, for two terms starting on September 17, 6:00-9:00 p.m. Theory and Morse instruction, fee £3-55, enrolment September 9-11, 6:00-8:00 p.m. with D. R. Doughty, G3FLS, as course instructor.

Manchester (Opeshaw): At the Technical College, Whitworth Street, enrolment September 9-11, evenings. Further details from the College, or A. B. Langfield, G3IOA, QTHR.

Manchester (Swinton): At Moorside High School, East Lancashire Road, on Tuesday evenings, commencing September 26. Details from P. Whatmough, G8BBF, QTHR (telephone 794-3706).

Motherwell, Lanarks.: Class to be arranged by Mid-Lanark Amateur Radio Society, apply D. H. Plumridge, G6CZQ, QTHR.

Newport, Mon.: At the College of Further Education, Nash Road, on Wednesdays, 6:30-9:30 p.m., with a practical constructional class on Monday evenings, same time. Tutors GW3YJT (Theory) and GW4COJ (Practical). Apply to the College, or L. A. Groutock, GW3YJT, QTHR.

Perth: At the Technical College, Crieff Road, commencing September 23, 7:00 p.m., enrolment evenings September 2-6. Course tutor D. Morris, GM3YEW.

Prince's Risborough, Bucks.: At the Adult Education Centre, Merton Road, Theory on Mondays, lecturer R. Whiting, G3POF, and...
Morse on Thursdays, taken by S. Ford, G4ACV, both sessions 7.0-9.0 p.m. Classes start September 23, enrolment evenings September 11-12, at the Centre.

Sheffield: At King Edward School, Darwin Lane, starting October 2. Details from J. Bell, G3JON, QTHR, or ring Sheffield 367774, evenings.

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SPECIAL 50p PACKS
Valve Bases B9C ceramic, 2 for 50p.
TOS Heatsinks, star type, 10 for 50p.
Belling Lee TV Plug, 6 for 50p.
Standard Jack Plugs, 4 for 50p.
STC Telephone inserts R., 50p.
Pye Mike Inserts, new, 50p.
Valveholders, assorted, 10 for 50p.
Mullard Tubular Trimmers, 1.18p, 6 for 50p.
Rubber Grommets, mixed bag, 50p.
Silicon Rubber Screwing, 1mm bore 50 yds., 50p.
5 Pin Din Plugs, 270 deg., 5 for 50p.
5 pin Din Sockets, 270 deg., 5 for 50p.
Reed Relays, 12v. 400 ohm, 2 pole make, 2 for 50p.
Min. Switches 4 pole 2 way, rotary spindle dia. 4 mm., 2 for 50p.
Bulbs, 6-3v. 3A capless, 20 for 50p.
Capacitor Clips, mixed sizes, 10 for 50p.
Valves, min. CV types, 20 for 50p.
Bandpass Filters, 25-35 MHz RT type, 50p.
Pots, 10 different values, 50p.
Miniature slider switches, 2 pots, 3 way, 10 for 50p.
Stereo Jack Sockets, 2 for 50p.
Self-adhesive foam pads, 30 mm. x 20 mm. x 3 mm. thick, large roll, 50p.
Min. 4 core Screened Cable, 10m. for 50p.
Ceramic tag strips, 10 for 50p.

SPECIAL £1 PACKS
2N3055 Power transistors, new, unmarked, 5 pin Din Sockets, 270 deg., 5 for 50p.
510uF 63V at 50mA, 10 for 50p.
MIN. 4 CORE SCREENED CABLE, 10M. FOR 50P.
Miniature Capacitor Clips, mixed sizes, 10 for 50p.
Reed Relays, 12v. 400 ohm, 2 pole make, 2 for 50p.
Min. Switches 4 pole 2 way, rotary spindle dia. 4 mm., 2 for 50p.
Bulbs, 6-3v. 3A capless, 20 for 50p.
Capacitor Clips, mixed sizes, 10 for 50p.
Valves, min. CV types, 20 for 50p.
Bandpass Filters, 25-35 MHz RT type, 50p.
Pots, 10 different values, 50p.
Miniature slider switches, 2 pots, 3 way, 10 for 50p.
Stereo Jack Sockets, 2 for 50p.
Self-adhesive foam pads, 30 mm. x 20 mm. x 3 mm. thick, large roll, 50p.
Min. 4 core Screened Cable, 10m. for 50p.
Ceramic tag strips, 10 for 50p.

TRANSMITTERS (NEW)
2N3819, 25p; AF211, 50p; AF212, 50p.
OC220, 20p; BD121, 50p; NKT0032, 5p.
NKT0032, 25p.

VALVES
Q380A 30V (ex-assembly), £2.20.
DE22 (ex-assembly), £1.00.
2C39A (ex-assembly), £1.00.
2C39A CERAMIC (ex-assembly), £1.60.
4C2508B (ex-assembly), £2.00.
6H6B (ex-assembly), 2 for 50p.

REELS OF 16 STRAND COPPER WIRE
Pink PVC covered, 0.5 mm. dia., for long wire antennae, 10m. for £1 each.
TWIN LEAD HAMMERS BULK, PVC covered, 50 pc. for £2.50.
TWIN LEAD HAMMERS BULK, PVC covered, suitable for rotary rotor, 5m. for £1.00.
MINIATURE UNISENSE BASES (42 pin), £2.50.
PYE CAMBRIDGE AM10D, dash mount, low-band only, medium cond., complete but untested, with circuits, £5.00, carriage 50p.
PYE CAMBRIDGE FH100, dash mount, low-band only, medium cond., complete but untested, with circuits, £5.00, carriage 50p.
20-25 kHz XTALS, glass B7G, for 405-line TV, 10m. for £10.00.
lin. VIDEO TAPE SPOOLS, empty, 50p.
HT STRIPPING CHOKES, 4H, 0-24A.
DC, brand new, 75p.
lin. VIDEO TAPE SPOOLS, empty, 40p.
JUST ARRIVED: Brand new Greenplan PTFE PL159 PLUGS, 50p each, 5 for £2.50. Reduced to fit above, 10p each (only sold with plugs).
LEADLESS LEADS, 30-300ohm, 70p each.
LEADLESS LEADS, 30-500ohm, 80p each.

ALL 240V input, voltages quoted approx. RMS.
MOD. TRANSFORMERS (ex-equipment)
300VA, tapped mains input, output 240V at 3A, £30.00, carriage 50p.
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1000VA, tapped mains input, output 240V at 0.5A, £90.00, carriage 50p.
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2400VA, tapped mains input, output 240V at 0.1A, £150.00, carriage 50p.

PHILIPS (A1/220) 12V, 50W, Quartz lamps, 1 pin, £1.50 each.
HONEYWELL, min. single pole c/o Microswitches, tin. long, 50p.
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HONEYWELL, min. single pole c/o Microswitches, tin. long, 50p.

SPECIAL PACKS
2N3055 Power transistors, new, unmarked, 5 for £1.
BY185 Rect. Sticks, 35KV at 2.5mA, ideal for scopes or SSTV monitor, £1.00.
JUST IN: PYE TELEPHONE HANDSETS for mobiles, with curly lead, brand new, boxed, £3.00.
TAP-Screw Pack, mixed sizes, 10p.
4BA HANK BUSH PACK (ideal for making aluminium cases, just drill pinhole, push in, and hammer over reverse side), 50p.

MAINS TRANSFORMERS
All 240V input, voltages quoted approx. RMS. (Please quote type No. only when ordering.)
TYPE F278s (ex-Pye F27 station Tx) £500 at 350mA, 6-3V at 8A, £3.50, carriage 50p.
TYPE 40/40V, 50A each.
TYPE 18/18V at 8A, £4.00, carriage 50p.
TYPE 14/6V at 6A, £5.00, carriage 50p.
TYPE 24/28V at 4A, £5.00, carriage 50p.
TYPE 24/28V at 4A, £5.00, carriage 50p.
TYPE 37/11V at 1A, 70p each, 2 for £1.40.
TYPE 1313 0-13V at 100mA, 40p each, 3 for £1.00.
TYPE 1258S 125V at 30mA (ideal for linear bias V), 50p each, 10 for £2.00.
TYPE 129 40V at 20mA, 200V at 1mA, 6-3V at 50mA, £1.00.
TYPE 72700 600V at 20mA, 18V at 1A, 50V at 25mA, £3.50 at 1.5A, £1.00.
TYPE 72703 40V at 10mA, 5mA at 5A, 6-3V at 400mA, £1.00.
TYPE 72703 14V at 1A, 100mA.
HIGH QUALITY SPEAKERS
6in. x 4in. elliptical, 2in. deep, 4 ohm, 90p each, 2 for £1.70.
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RECESS MAGNET, rated up to 100 metre sphere (carriage £1.00).
IDEAL FOR VARICAP TUNED RECEIVERS...
BECKMAN, DUODIAL, Min. counting turns dial, pin, dia., with locking lever, 0-100 on main dial, with 0-14 on 1:10 vernier dial, for standard spindle, brand new, boxed, 50p each.
AS ABOVE... 10in. dial, pin spindle, £2.00 each.
MULTITURN POTs (for use with counting dials above) 2Kohm, 100Kohm, 10-turn, available only, Linear, pin, spindle.

B. BAMBER ELECTRONICS
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