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practical **Wireless**

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PW ANTENNA DATA CHART

WIN

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ALINCO DJ-190



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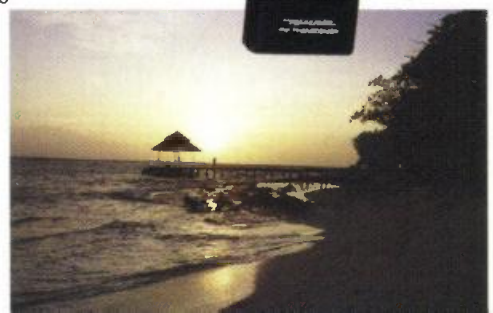
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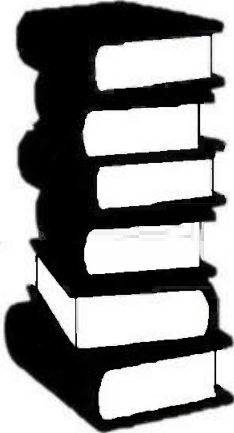
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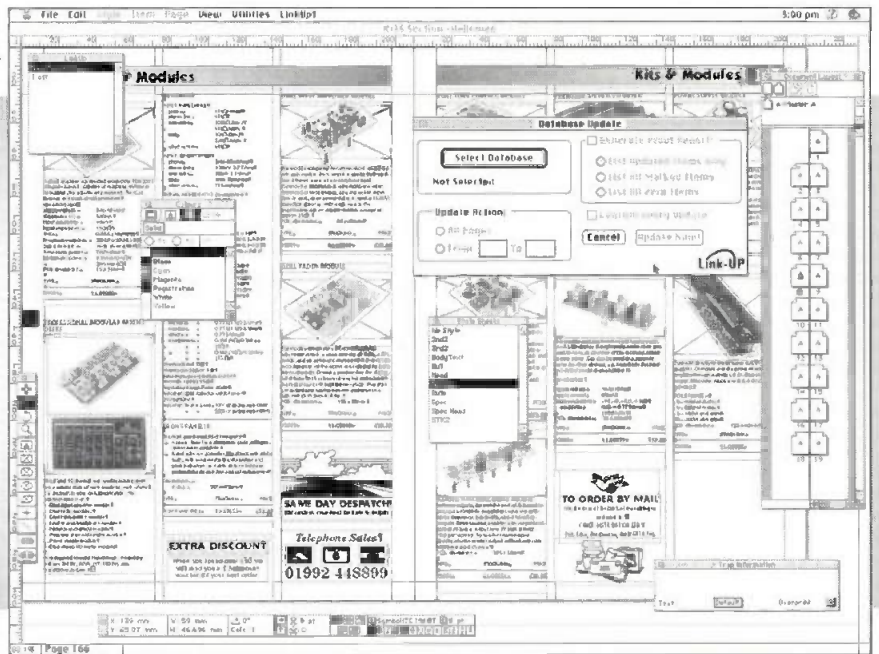


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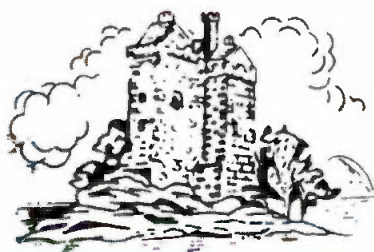
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EDITOR'S Keylines

Rob Mannion's viewpoint on the World of Amateur Radio

When I took over the Editor's chair at *PW* seven years ago I was keen to introduce the readers' page now known as 'Bargain Basement'. I was very aware that the market within our hobby supports a thriving second-hand 'department'. So it was no surprise that 'BB' has proved to be a success.

'Bargain Basement' has proved to be so successful and useful a section in *PW* that as from our June issue all readers' advertisements will be free. The only provisos are those already in existence (advertising illegal equipment) and that the adverts are for non-traders only.

Further details on the extensions to the 'BB' pages can be found on page 59. However, if you need any guidance, **Zoë Shortland** who compiles 'BB' will be pleased to hear from you.

Picketts Lock

You'll find a short news round-up and comments on the Picketts Lock show on page 40 this month.

However, I particularly want to mention how fascinating I found the 'Vintage' section of the 'London Amateur Radio & Computer Show' (to give its 'official' title!).

There's a growing interest by Radio Amateurs in older equipment. I can back that statement up by the number of letters I receive on the subject. And I hope that next year we'll have many more traders in this section of the show.

Finally on Picketts Lock, I must also comment on the increasing number of visitors from mainland Europe. I heard French, Dutch, German and Italian being spoken. I also met old friends from Denmark (they speak better



English than I do!).

A large number of visitors from Belgium, France, Germany and Holland came by train, travelling on the 'Eurostar' and the Channel Tunnel. What a shame they could not use Ponders End railway station (only a short walk from Picketts Lock) on the mainline from London to Stansted Airport and other useful places. But, would you believe it, Ponders End station is closed at weekends!

Let's hope that next year those who would like to travel by train to the show, will be able to benefit from Ponders End station. In the past I know that the show organisers have tried to persuade British Rail to open the station. But now that 'privatisation' is making its mark, you never know, potential passengers may even find that there is an advantage to railway privatisation and that they can use the train and travel to a station within walking distance of the show!

World Waveguide

It's an unfortunate fact of life that we've got to accept that the BBC World Service

Waveguide programme is not intended for 'home consumption'. That's why (I joke of course) the programme is transmitted at 0350am (GMT).

However, being a very keen listener (and a very occasional!) contributor to *Waveguide*, I was very disappointed to hear from our 'Broadcast Round-Up' compiler Peter Shore, that the programme is to be discontinued later in the year (see page 56).

It seems that the BBC have decided to stop producing the *Waveguide* programme on a regular schedule (it will re-appear but only on an occasional basis). Listeners will then lose the only regular programme which covers broadcast (and occasionally amateur radio) subjects.

I must admit that I rarely listen to the programme 'live'. It's recorded automatically by my timeswitch and tape recorder installation straight from the v.h.f. Band II service of Radio 4 (World Service is now carried on v.h.f. after close-down of Radio 4, and is also available from Droitwich on 198kHz) and I am able to listen during 'civilised hours!

Waveguide provides a great deal of interest for the radio amateur and s.w.l. alike. Recently, Lowe Electronics were featured and last November interviews recorded at Martin Lynch's 'Open Day' were also broadcast on the programme. It's important that the outside world knows we have a thriving electronics industry and amateur radio activity.

So, I suggest that if like me (especially readers based abroad) you enjoy *Waveguide* that you should write to **Sam Younger**, the Managing Director of the BBC World Service, Bush House, The Strand, London WC2B 4PH. His direct FAX number is 0171-379 6841 (from outside the UK it's 44-171-379-6841).

I shall be writing to Mr Younger to ask the BBC World Service to re-consider the decision on the future of *Waveguide*. Don't forget, it was 'audience power' that helped to save Radio Canada International!

Droitwich Project

Thinking about the BBC and their plans brought the *PW* Droitwich project to mind. Named after the famous (and

venerable) long wave 198kHz transmitting station in the English West Midlands, this project has proved to be of great interest to readers. Unfortunately, there seem to be a few problems with the p.c.b. and the project itself.

As Editor (and consequently the person responsible for the magazine's content) I am profoundly sorry that once again another good project in *PW* has been spoiled by mistakes. As I'm now fully aware of the problems on the p.c.b. and the associated difficulties, I will ensure the corrections and necessary amendments are published as soon as possible.

In rounding off this month, despite my valiant attempts, annoying and unnecessary mistakes continue to appear in *PW*. I can assure you that I find this far more frustrating than readers do, and I'm determined to back up our excellent projects and ideas with accurate publishing.

Unfortunately with a very small Editorial team and a continuous high pressure working environment, mistakes are inevitable. However, with good managerial skills and determination I'm sure I can overcome the problems to bring you an even better *PW*. But if I fail, for the sake of the magazine and loyal readers I'll have to make way for someone who can make it work.

*Rob Mannion
G3XFD*

RECEIVING You

PW's Postbag. If your letter is published you'll win a prize.

Middle Class Attitudes?

Dear Sir

I read your advertisement in the current issue of *Radio Communication* offering a subscription to *PW*. And as I had not seen a copy of it recently, I bought one today to see what it is like nowadays.

When I came to the feature 'Receiving You' and read the letter from Mr G. R. Wilkie of Stirling on the question of the Morse Test I was bewildered to see what this has to do with Middle Class attitudes, perhaps I have missed something?

When I became a Radio Amateur in 1928 I entered a wonderful world of comradeship. Some amateurs had enjoyed a 'good education' whilst others had, like me, had only an elementary schooling. My parents could not afford to send me to a grammar school. Nevertheless, we all had to take the Morse test!

We had no ready made 'Black boxes' - not that I could have afforded to buy one. We built our own rigs - basic it's true, but there was not another radio amateur who was not ready with help and advice.

I think the chip on Mr Wilkie's shoulder is a post-war phenomenon.
Richard Walker G6QI
Cornwall

Imperial Dimensions

Dear Sir

On behalf of the many 'oldies' who still look forward to reading your

excellent magazine, I wonder if I could ask for dimensions to be given in imperial, as well as the metric system? It would be so helpful, to me anyway, as I'm not used to these 'foreign' dimensions!

Cyril W. Finch G3AHO
Bedfordshire

Editor's comment: The decision to make *PW* fully metric (apart from 'vintage style' articles where it's impractical) was taken before I joined *PW*. As it can be confusing to put equivalents side-by-side we only offer metric unless there's a special reason for mentioning both. However, I've quickly adapted to either system and don't bother with the calculator as my ruler offers imperial and metric on opposite sides. A quick comparison sorts out any confusion. And after all, radio has been 'metric' from the beginning. (Calling "CQ 87, CQ 87" (87 yards) rather than '80' would sound odd wouldn't it Cyril?

PW Reviews

Dear Sir

I have been reading *PW* for only three years or so. But already I feel like 'an old hand' despite the fact I am only just finishing college. Now it's job finding time!

During the time I have been reading *PW* it's become obvious that the magazine's policy of honesty in approach to reviews is sincere. I trust what *PW* and its authors say and am dismayed that there have only been

complaints rather than compliments following statements of the Editorial policy. All the reviews reflect the opinions of the authors and they are not anonymous reports.

And what other magazine would publish criticisms of itself and its Editor? If you call on the telephone to speak to the Editor in Broadstone you get through and actually speak to the man himself and not a 'Minion' (sorry about that Rob!).

Having met the Editor at the Rochdale QRP Convention last year and at many different rallies, I and many others know that the Editor and his 'team' are all very approachable. Their honesty is not in question because I don't know of any other magazine that will publish critical letters against itself as well as those praising its content.

Finally, now that I have passed the RAE I shall be in the market for a rig and will certainly consider a Kenwood, thanks to Dave Wilkins G5HY who had the courage of his convictions and 'stood up to be counted' in 'Receiving You'. Well done Dave! And keep up the good work *PW* team. I appreciate your honest stand and know you will not give way to publish manufacturer's publicity masquerading as reviews and that you do your best on behalf of readers and the hobby. If you publish my letter, please send the £5 voucher to the RAIBC on my behalf.

Steve Cutler
South Yorkshire

Editor's comment: Thank you Steve, I promise we will carry on trying our best on behalf of readers. The

correspondence on *PW* Reviews is now closed.

Morse

Dear Sir

I'd like to add my 'twopennyworth' to the Morse/anti-Morse on-going soap, and as a QSL sub-manager for the past 12 years, I like to think I have earned my right to pass an opinion. I can imagine that should it come to pass that the Morse test is no longer required to operate on the h.f. bands, it could well lead to very embarrassing moments for the non-

The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by *Practical Wireless*. All other letters will receive a £5 voucher.

Back-Biting & Pigeon-Holing

Dear Sir

I am dismayed to see so much in-fighting, cliques, back-biting and pigeon holing in our fine hobby. We are, after all, travelling down the same road together. Let's all make the effort to get on with each other, then others from outside the hobby would see us as united and friendly towards each other.

Perhaps then they would be more encouraged to join us. By the way, why is it that all G2s are 'boring old farts' - G3s 'bullying know alls' and G6s young, noxious spotty persons who repair TVs for a living?

R. P. Walmsley G0DKW
Northampton

Editor's comment: Speaking as a 'Bullying Know All' G3, I insist that everyone adopts G0DKW's approach! We must stand and work together. Anyone who doesn't will get a visit from 1.9804m (6ft 6in) tall 127kg (20 stone) G3XFD!

THIS MONTH'S STAR LETTER

'Lucky Lutterot'

Dear Sir

Ref PW March and the article 'Lucky Lutterot'. Reading of Jan Lutterot came as a surprise.

Jan Lutterot, featured on page 31 of March PW, was Chief Radio Officer on board the Dutch steam tanker *Backhuysen* in 1944. I was his Junior. Here is how we met.

In common with all Allied shipping then, the Dutch had taken a pounding and were short of ships. The British Ministry of War Transport, with responsibility both for British shipping and that of our European allies, agreed to hand over the British tanker *Empire Fletcher* to La Corona, a Dutch subsidiary of the Royal Dutch Shell Group.

The *Empire Fletcher* was built in 1942 and operated by the Anglo Saxon Petroleum Company for the British Ministry of War Transport. In 1944, she became the Dutch tanker *Backhuysen*.

Along with Frank Bakewell, a Radio Officer from Nottingham, I joined the ship in Liverpool in early 1944. I was the Third Radio and Signals Officer (the signalling referred to use of the Aldis lamp, and I earned my corn!). Once aboard, Bakewell and I met Jan Lutterot, the Chief Radio Officer.

The radio gear was basic Marconi: a 200W medium wave transmitter (Type 381), a main 'straight' receiver (Type 700-730) that needed hand-operated plug-in coils to obtain the desired waveband (superhets were not then on the menu for the average British dry cargo ship or tanker), an emergency spark-gap transmitter and a Bellini-Tosi direction finder.

Apart from a small t.r.f. m.f. receiver and a portable lifeboat transmitter, that was it! There was no h.f. transmitter, no r.t. and no Radar. In those days Radar was mostly restricted to capital ships, armed merchant ships, troopers and the like, but we managed with what we had.

The 381 worked off two diode rectifiers and a triode oscillator. In its defence, Marconi operators would say that a 381 fault was easy to find - you could see it!

A few days after joining we left Liverpool in convoy for New York. We kept a continuous radio watch on 500kHz at sea. Jan had the 8-12, I had the 12-4 and Bakewell the 4-8. It was a listening watch only, with transmissions received on h.f. from Portishead every four hours.

From New York we went across to New Jersey to load high octane

aviation fuel for delivery at Shellhaven in the Thames. Then it was back to the USA to load aviation gasoline for Port de Bouc, on the southern Mediterranean coast for France, an area recently invaded by the US army.

Again the USA and another load of high octane, this time for the Bari, in southern Italy, where the British Eighth Army was busily winning its part of the war. The Adriatic was a bit 'hairy', with German E-boats patrolling at will.

An Italian light cruiser was our designed escort from Port Augusta for Bari, but for reasons best known to himself the Italian commander left us to our own devices when abeam of Taranto and hightailed it at speed for the Italian coast. From there to Bari we were on our own.

Luckily we stayed clear of the German E Boats, then operating from Yugoslavian island retreats. I say luckily advisedly! Although we had a small complement of British DEMS and maritime anti-aircraft gunners on board, the only firepower available to them was an old 4.7in gun mounted aft, a 12-pounder anti-aircraft gun, four Oerlikons and four Browning 0.5in calibre heavy machine guns, the latter mounted in batches of four for massed anti-aircraft fire. Even so, this was hardly the clout needed if a German MTB chose to sneak up on us at 45 knots with a spread of HE torpedoes!

Should the worst have happened, a torpedo attack, we wouldn't have known. With 12000 tons of 100-octane petrol on board there would simply have been an almighty bang.....goodnight Vienna!

After the Bari discharge - in a harbour littered with bombed wrecks of German and Italian ships - our orders were for Curacao in the Dutch West Indies, for dry-docking. The timing was perfect and we had Christmas and New Year there. Much Bols gin was consumed at the in-bond price of four shillings (20p!) a litre - and a good time was enjoyed by all.

Then it was back to the war. From Curacao we left for England via New York, again with a full cargo of high octane gas, this time for discharge at Liverpool. By now Bakewell and I were due annual leave and we paid off in Liverpool.

We said our goodbyes to Jan and I heard no more of him until I read your 'Lucky Lutterot' article, 51 years on! Small world isn't it? Harry Rayner (Marine Radio Officer, Rtd.) Derbyshire

Editor's comment: A rather longer letter than we usually allow. However, I've no doubt readers will appreciate why we did not shorten Harry's fascinating story.

Morse operator.

Imagine if you will an s.s.b. only operator showing to friends the ins and outs of amateur radio and whilst tuning around the bands he comes across some Morse and is unable to answer the visitor's question regarding the meaning of the said Morse: "I can't read Morse".

My sympathies rest with the people who have come into amateur radio from civilian life and who have spent much of their spare time learning Morse and then finding out the pleasures of using that mode. Here's hoping the Morse test stays a requirement for ever.

John Densem G4KJV
Chippenham

Snobbery Against Novices

Dear Sir

I have been licensed for nearly two years now as a Novice, but I am told I am not a real amateur (whatever a 'real' amateur is!). As far as I am concerned, there is snobbery among some of the fully licensed amateurs in this country. So I am writing this letter to get an objective opinion from fully licensed amateurs and why they take such an opposing view towards the Novices.

There are only a selective few unwilling to talk to a Novice, even though I think this is too many. It's downright unfair due to the hard work I put in to receive

my licence. If you have any comments or opinions I will be pleased to receive them on E-mail via: chris@globalnet.co.uk Chris Upton 2E1DTV Doncaster

Editor's comment: I was dismayed to read Chris Upton's letter regarding his perception of 'Snobbery' against Novice operators. I think that generally, apart from several stations on 3.5MHz apparently ignoring calls from Novice operators recently, the problem seems to have reduced. However, in my experience (particularly on c.w.) the Novice stations I've worked have impeccable manners and are a joy to work. Perhaps we've all got something to learn!

Reader's letters intended for publication in 'Receiving You' must be original and not be duplicated. Letters are accepted on the understanding that they have only been submitted to *Practical Wireless*. Please ensure that your letter is clearly marked 'for publication in Receiving You' and that it has not been submitted to other magazines. We reserve the right to edit or shorten any letter. The views expressed in letters are not necessarily those of *Practical Wireless*.

Letters Received Via The 'Internet'

Many letters intended for 'Receiving You' now arrive via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! Editor

Send your letters to the PW Offices, marking it clearly for 'Receiving You'

NEWS 1996

Compiled by Donna Vincent G7TZB

Mobile Technology



The latest in mobile communications to come from Yaesu takes the shape of the FT-3000M v.h.f. high power transceiver.

The manufacturers state that in addition to the 70W of high power output the FT-3000M features many 'industry firsts'. These 'firsts' include an Intensive Programming System, Smart Search Memory Storage, twin cooling fans, four programmable soft buttons, Digital Coded Squelch (DCS) and Dual Expanded Receive with u.h.f. up to 990MHz.

Other listed features are an interactive memory system, Automatic Range Transponding System, which uses DCS to poll other stations to indicate if they're in simplex communication range, 81 memory channels, 1200/9600Baud Packet compatibility and ADMS-2B Windows™ PC Programmable.

The retail price for the FT-3000M is £479 and more information is available from any Yaesu approved dealer.

Fish Finishes - Almost!

One of the best known names in the Amateur Radio Retail trade in the north, **Jim Fish G4MH** of 'Mini-Beam' fame has retired from his Huddersfield shop - almost! Jim, who has been active in the retail side of Amateur Radio for 35 years, has sold his business to **Martin Stokes G3ZXZ** who is trading as 'Huddersfield Electronics' - Incorporating The Amateur Radio Shop'.

Jim Fish was first licensed as **G3JML** in 1954

and then took four years to obtain the now famous callsign **G4MH**, which was previously held by his Grandfather. Then the **G4MH** callsign became firmly associated with the famous 'MiniBeam' antenna.

Although the 'Amateur Radio Shop' business started in Jim's home village of Golcar, for many of his 'mobile' customers it's more associated with the Yorkshire town of Huddersfield. And as many radio amateurs also had 'official' business at the nearby Emley Moor TV transmitter, they were able to call en-route! But, users

Air Radio Training

The Picketts Lock show saw the launch of the Air Training Corps New Radio Training Document on the RSGB's main stand in the Green hall. A copy was presented to **Peter Kirby G0TWW**, RSGB General Manager, in the presence of **Hilary Clayton-Smith G4JKS**, Member of Council. Presenting the RSGB's copy is leader of the group who prepared the

manual **Squadron Leader Tony King**, accompanied by **Flight Lt. Malcolm Wood**

G7VRT and **Ray Degg G0JOD**.



STOP PRESS - Revised RAE

The 'Newsdesk' has recently been in touch with the **City & Guilds** regarding rumours of proposed changes to the **Radio Amateurs' Examination**. The official word from the **City & Guilds** is that the revised RAE will be put into operation from May 1997 and that it will consist of **only one multiple choice question paper with 80 questions lasting 2½ hours**.

There are to be no major changes to the syllabus and the topics covered by the exam will be: **Licensing Conditions; Operating Procedure and Practices; Electronic Principles and Practice; Receiver and Transmitter Systems; Transmitter Interference; Electromagnetic Compatibility; Propagation and Antennas and Measurements**. It's hoped the revised RAE will reflect an increasingly realistic and modern approach whilst maintaining the present

high standards.

Candidates who have already passed one of the two papers under the current system will have two more opportunities to re-sit the remaining paper in **May and December 1996**. As from May 1997 candidates who have passed only one paper will be required to sit the revised RAE as a whole.

Practical Wireless will bring you more news as soon as it becomes available.

of the **G4MH 'MiniBeam'** need not worry about spares, because Jim's long term colleague **Norman Hodgson G3WAH** is to continue manufacturing the antenna.

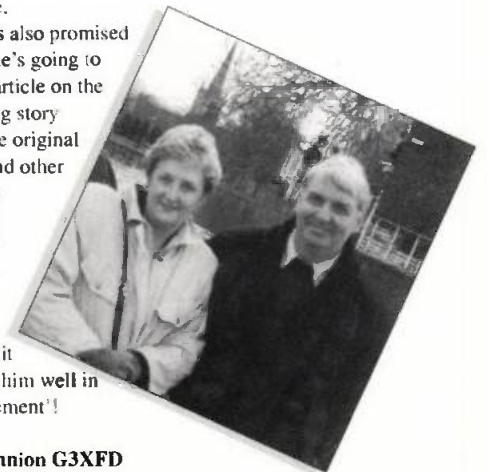
Full retirement is out of the question for Jim Fish, as he's now concentrating on the 'Wilson's Valves' aspect of his work. Jim's expertise and wide range of valves have become an important part of his business, as his stand (next door to the *PW* stand at The Leicester Amateur Radio Show) always demonstrates and if you need a 'difficult-to-find' valve, you can always write to Wilson's Valves at **28**

Banks Avenue, Golcar, Huddersfield, West Yorkshire HD7 4LZ, or telephone **(01484) 654650** for advice.

Jim has also promised *PW* that he's going to write an article on the fascinating story behind the original **G4MH** and other Yorkshire 'Amateur Wireless' pioneers. We look forward to seeing it and wish him well in his 'retirement'!

Rob Mannion G3XFD

Jim Fish G4MH and his wife **Kath**, the personalities behind 'Wilson's Valves'.



International Marconi Day - 20 April 1996

The first **International Marconi Day** event run by the **Cornish Radio Amateur Club** took place in April 1988 and since then has made great strides, going from strength to strength. This year, the 9th event will run on April 20 (the closest day prior to Marconi's actual birth date) between 0000 to 2359UTC on all h.f. bands (s.s.b. being the main mode) world-wide. All modes are permitted and encouraged.

As has been the case in the past official groups will be participating in the UK, Eire, Austria, West Germany, Spain, Italy, Australia, South Africa, The USA, Canada and South America. All these will be ready and willing to take as many calls as possible to count towards the number needed to enable claims to be made for either the transmitting or s.w.l. award.

The Cornish club have amended their award categories for 1996. The most important change is the inclusion of a multi-operator section which has been introduced to give radio clubs the opportunity to take part and work towards a nice certificate for the club house wall!

There are seven award classes and these are: Transmitting Amateur, Transmitting Amateur Mobile, Transmitting Amateur c.w., Transmitting Amateur Digital modes, Transmitting Amateur Multi Operator, Shortwave Listeners and Shortwave Listeners c.w.

All award claims should be made in writing giving a full extract of log entries to: **Sue Thomas G0PGX, Cornish Radio Amateur Club, IMD Awards Manager, PO Box 100, Truro, Cornwall TR1 1RX**. To claim an award in any class the cost is £4 (sterling), 10US\$ or 12 International Reply Coupons.

For more information please contact **Norman Pascoe G4USB** at **G4USB@GB7BBS.#28.GBR.EU** or **101534.1011@compuserve.com**

A full list of stations to listen out for is available from the **PW** Editorial Offices. Mark your envelope 'Marconi Day'.



Haydon's Summer Of Fun

Mike Haydon has recently opened a branch of his already successful **Haydon Communications** radio business in the West Midlands at **Unit 1, Canal View Industrial Estate, Brettell Lane, Brierley Hill, West Midlands DY5 3LQ**. Tel: (01384) 481681, FAX: (01384) 481330. To celebrate this new venture Mike has announced three summer Open Days. The Open Days will take place on Sunday June 16, Sunday July 21 and Saturday August 24.

You are assured of a warm welcome together with free tea and coffee and the chance to see the range of Serene and Cushcraft antennas. Yaesu, Kenwood and Icom equipment. There will be an h.f. demo station and much more. **Bill G4KZJ** and **Martyn G4THE** will be on hand to serve you and assist Mike in running the West Midlands branch of Haydon Communications.

Why not go along? You have three dates to choose from so there's no excuse for missing out.

The **PW** team would like to wish Mike Haydon and his staff every success in the West Midlands.



Everyone's A Winner

In August 1995 issue of *Practical Wireless* we ran a competition for readers to win a **Sigma SD-610** multi-band trap antenna donated by **Eastern Communications of Happisburgh, Norfolk**. The lucky winner was **Mr Alfred Low G4UZZ** from Dundee.

Unfortunately the SD-610 was too big for Alfred's QTH so he decided to share his good fortune. After contacting **Tim Thirst** of

Eastern Communications it was decided to split the prize into three different sigma antennas.

Alfred selected an SD-34 trap for himself, an SD-42 as a gift for his son **Stewart**

GM4KGZ and another SD-42 for the Dundee Radio Club. The photo shows Alfred on the right presenting the antenna to **Ray Bennett GMOPTP** of



the Dundee club.

The second prize of antenna traps was won by **G3LTB** and the third prize of antenna shorteners to **G7TTT**.

FREE * FREE *
FREE * FREE *

Are you thinking of sending in an advert for **Bargain Basement** and getting ready to make that payment of £3? **Stop now!** All adverts received from now on will be **FREE!**

Free to readers and subscribers.

You can even send in a photograph to accompany your advert. However, all photos will be published at our discretion and are non-returnable. See page 59 for more details.

Handy Business Radio

Motorola, the International Communications company have announced the introduction of **Handie-Com** short range business radio transceivers which take advantage of easier

access 'business radio' channels on v.h.f. The transceivers are designed to work on a p.m.r. 'open channel' basis, with an easier-to-get business licence which costs only £30 for three years.

The manufacturers state that the inexpensive (prices start at around £150

including VAT) rugged simple-to-use transceivers will find applications at rallies, shows, department stores, factories, farms, and in fact wherever short-range communications are needed.

Transceivers available range from the basic model (not supplied with NiCad

batteries) to models fitted with accessory sockets, voice-operated transmission (VOX). A wide range of accessories are available for all models.

Further details on the Motorola Handie-Com range of Business Radio transceivers are available

from **The Short Wave Shop, 18 Fairmile Road, Christchurch, Dorset**. Tel: (01202) 490099.



HAYDON COMMUNICATIONS

HF TRANSCEIVERS

ICOM IC-706
HF transceiver with 6+2m.
RRP £1495.
OUR PRICE £1099 *Save £180*
Plus FREE P-2512 power supply

YAESU FT-840
Compact HF transceiver.
The UK's No 1 mid priced
quality HF transceiver with gen cov Rx.
RRP £850. **OUR PRICE £749.00**

YAESU FT-1000 MP DC/AC
State of art HF transceiver.
Give us a call for best part-ex deals or the
lowest UK price.
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KENWOOD TS-870S The very
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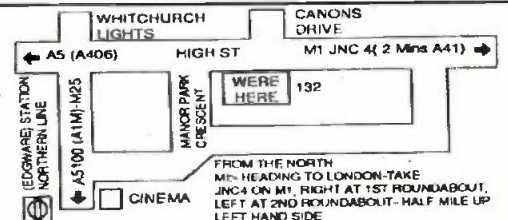
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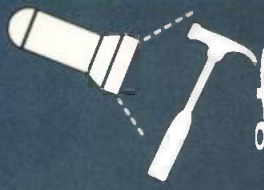
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A35	14-21-28MHz Yagi	£349.00
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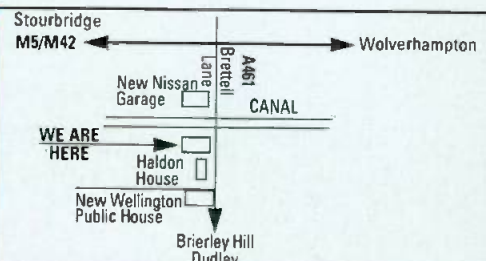
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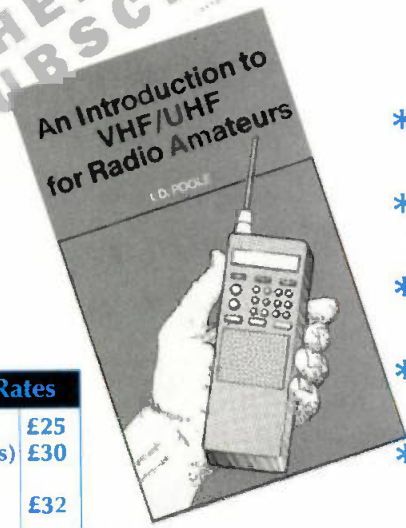
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Isn't it time you subscribed to *Practical Wireless*?

1996

April 12: The Bangor & District Amateur Radio Society will be hosting a talk by Rob Mannion G3XFD, Editor of *Practical Wireless* in the Winston Hotel, Bangor, Co. Down. It will commence at 8pm and all are welcome. The hotel lies along the seafront opposite the marina. Refreshments will be available and there is ample car parking available, opposite the venue. Further information from Terry G13USS on (01247) 473948.

April 14: The Cambridgeshire Repeater Group annual rally will take place again this year at the Philips Telecom Catering Centre, St Andrews Road, Cambridge. The event will feature an auction sale, trade stands, Bring & Buy and a car boot trading area. More information can be obtained from Paul Dyke G0LUC on (01920) 821536.

April 14: Bury Radio Society Annual Rally will be held at the Castle Leisure Centre, Bolton St., Bury. Doors open at 11am and 10.30am for disabled visitors. The Bring & Buy will be run by members of the Rochdale ARS. Refreshments and a licensed bar will be available. Facilities for the disabled. The Leisure Centre is next to East Lancs Railway (steam preservation line), so why not bring all the family and have an enjoyable day out. Laurence G4KLT on 0161-762 9308.

April 14: Lincolnshire AMS '96 - Computer & Electronics Show, Springfields Exhibition Centre, Springfields Gardens, Camelgate, Spalding, Lincolnshire. Entrance fee for adults is £2.50. OAPs £2.30 and children under 14 free. There will be a wide range of new and second user goods, accessories, electronic components, multimedia, CDs, software, upgrades, consumables, etc., there will also be a Bring & Buy. Sharward Promotions, Upland Centre, 2 Upland Road, Ipswich, Suffolk IP4 5BT. Tel: (01473) 741533.

April 14: The Swansea Amateur Radio Society are holding their Amateur Radio & Computer Show at the Swansea Leisure Centre. Doors open 10.30am to 5pm. Entrance fee is £1 for adults and 50p for children. There will be trade stands, Bring & Buy, local repeater groups, special interest groups, as operational h.f./v.h.f. station, s.s.b. and packet. Talk-in on S22. There will be full catering and a licensed bar. The Leisure Centre is located

RADIO

Compiled by Zoë Shortland

near the City Centre on the A4067 Swansea - Mumbles coast road. Further details from Roger GW4HSH on (01792) 404422.

April 14: The Launceston 10th Amateur Radio Rally is being held at the Launceston College. There will be well-known traders, Bring & Buy, Morse test on demand (bring two passport photos) and hot snacks. Talk-in on S22. Ample parking. Roy G0IKC on (01409) 221624 or Paul G0UFV on (01566) 776108.

April 21: Lough Erne Amateur Radio Club will be holding their 15th rally at the Killyhelvin Hotel, Enniskillen at 12pm. Attractions will include Icom & Alinco trade stands, the usual Bring & Buy, etc. Contact Kieran on (01365) 327133 (evenings) for more details.

April 21: The White Rose Amateur Radio Society (PO Box 73, Leeds LS1 5AR) are holding their 29th Annual Radio, Electronics & Computer Rally at the Leeds University Sports & Leisure Centre (new venue). Doors open at 11am (10.15am for disabled visitors). Free parking for over 1000 vehicles, usual reliable traders, bar/cafe/terrace, Bring & Buy stall. RSGB in attendance. Trader enquiries to Allen G7ELS on (0973) 189276.

April 21: Amateur Radio Rally in Dunkirk, France. 10am to 6pm at the Palace of Congress. Lots of European dealers, free car parking (in front of the Palace), restaurant and Bring & Buy. Access direct from Calais via motorway, access frequency 144.400MHz f.m. simplex. Michael Moulin on (33) 1 39 31 28 00.

April 28: The Marske-by-the-Sea Radio Rally is being held in the Marske Leisure Centre, High Street, Marske-by-the-Sea, near Redcar. Doors open at 11am. There will be all the usual traders, Bring & Buy and refreshments, plus a talk-in on S22. Alistair G4OLK on (01642) 475671.

April 28: The British Amateur Television Club's Rally '96 will be held at the Sports Connexion, Coventry. As always, there will be plenty of traders, special ATV displays and clubs, outside broadcast displays, Bring & Buy and an outside boot fair/flea market. The rally opens at 9.30am for disabled visitors and 10am for the general public and will close around 5pm. Admission will be £1 for adults and 50p for OAPs and under 14s. Michael Wooding G6IQM on (01788) 890365 or FAX: (01788) 891883.

May 6: The Dartmoor Radio Rally is to be held at Yelverton Memorial Village Hall, Meavy Lane, Yelverton, Devon. There is enough parking for 600 cars and there is access for disabled visitors and a playground for children. Trade stands, Bring & Buy, refreshments and talk-in on S22. Ron G7LLG on (01822) 852586.

May 12: The Drayton Manor Radio & Computer Rally will be held at Drayton Manor Park, near Tamworth. Trade stands, Bring & Buy, flea market, local clubs and special interest exhibits, licensed bar and a fun day for all the family. Peter Haylor G6DRN on 0121-443 1189, mobile (0860) 657468 evenings please.

***May 17/19:** The Dayton HamVention, the largest amateur radio show in the world, is taking place at the Hara Convention Centre in Ohio. Doors open at 12pm on the 17th and the event runs until early afternoon on the 19th. For the early risers, the Flea market is open from 6am on the 17th. You will be able to visit many trade stands, attend lectures and meet amateurs from all over the world. (PW Publishing are again organising a trip to the HamVention, for more details contact Donna Vincent G7TZB on (01202) 659910).

If you're travelling a long distance to a rally, it could be worth phoning the contact number to check all is well, before setting off.

The Editorial staff of *PW* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers.

If you have any queries about a particular event, please contact the organisers direct.

Editor
* Practical Wireless & SWM in attendance

A PRACTICAL WIRELESS SPECIAL PRIZE COMPETITION

WIN AN ADI AR-146 MOBILE TRANSCEIVER

WORTH £269

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In the April issue of *Practical Wireless* John Goodall G0SKR reviewed the AR-146 mobile transceiver. In his review, John described the AR-146 as an "excellent quality transceiver at a thoroughly affordable price" and now you have the chance to win the ADI AR-146 in this easy-to-enter competition!

How To Enter

All you have to do is answer the three questions below based on G0SKR's review as featured in *PW* April. If you missed the April issue, back issues are available for £2.30 inc P&P from the Post Sales Department, Tel: (01202) 659930. Send your completed entry form (photocopies acceptable with corner flash to *Practical Wireless*, AR-146 Competition, May 1996, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. The Editor's decision on the winner is final and no correspondence will be entered into.

- **FIRST PRIZE:** The ADI AR-146 Mobile Transceiver and a year's subscription to *Practical Wireless*.
- **SECOND PRIZE:** A year's subscription to *Practical Wireless*.

Entries to reach us by Friday 24 May 1996.

Questions

Q1: What is the high power output in Watts of the AR-146?

Q2: Name the three scan modes available to the operator using the AR-146.

Q3: What is the purpose of the AR-146's Lock-Out facility?

Entry Form

Q1:

Q2:

Q3:

Name Callsign

Address

Postcode

If you do not wish to receive future mailings as a result of entering this competition please indicate here

NOVICE Natter

For Radio Beginners Of All Ages

Elaine Richards G4LFM gives you an insight into the process involved in getting an amateur licence and shows you that it isn't as difficult as you may think!

There's an old saying that goes something along these lines. 'Nothing worthwhile is ever easy!' This saying can also be applied to any of the various amateur radio licences!

You can't just walk into your local radio shop or local Post office, sign on the dotted line and hand over your money for your licence. You do have to work for your licence, but it's worth the effort as radio amateurs have a large chunk of the radio spectrum available to them and scope to explore this and the multitude of modes which are available.

Dilemma Faced

The dilemma faced a prospective radio amateur student is, do I want a Class A, B or Novice licence? And contrary to popular belief, there is no upper age limit for a Novice candidate. Although the Novice licence was introduced to encourage the younger element, that doesn't preclude older candidates.

You do however, need to contact your local Senior Novice Instructor and this isn't as difficult as it sounds. If you belong to a radio club, then they will know the details, if not then the **Radio Society of Great Britain (RSGB)** have all the details of the Novice instructors and they can put you in touch with the nearest one to you.

The Senior Instructor will be able to advise you where your nearest course is being run, who to contact and what's involved. You will often find that many

radio clubs run Novice Groups and these can be a valuable service of advice and help.

So, if you are going to go down the Novice route, the RSGB at **Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE** must be your first step. But what do you do if you decide to go for a Class A or B licence?

Multiple Choice

For a class A or B licence you have to sit the same multiple choice exam whichever licence you want to end up with. The difference between the two

classes is that to obtain the A licence you have to take a Morse test (I'll deal with that later if space permits).

At present the exam is a two-paper City and Guilds

Exam (see 'News' pages in this issue for details of how the exam is to change in the near future) one part on regulations and the other part could be described as

basic radio and operating theory. Exams are held at designated examination centres (usually colleges where the course has been held).

Yeovil Amateur Radio Club

I must get in a few details about the **Yeovil Amateur Radio Club** as they will again have a Novice and Beginners Corner at their 1996 QRP Convention.

This year the QRP Convention date will be Sunday May 19 at **The Digby Hall, Sherborne, Dorset** that is just five miles from Yeovil. The Novice and Beginners Corner will have details on how to become a Novice and someone will be on hand to answer questions from newcomers.

The Convention also includes formal talks on amateur radio topics, displays of equipment, a construction challenge and traders. Entrance to the Convention is free to under 18 year olds, still in full-time education who apply for tickets before the event. More information can be obtained from **George Davis G3ICO** on (01935) 25669.

Novice Course Books

The Novice Licence Students' Notebook basically takes you step by step through the Novice Course. Many Novice Instructors use the Instructors version of this notebook as the basis of their lectures.

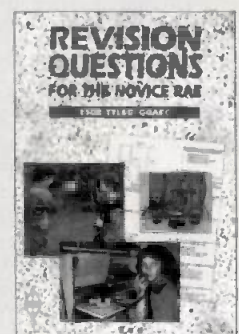
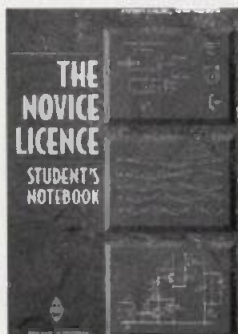
It's a simple and uncluttered book and therefore nice and easy to understand. If you're not sure whether you could complete a Novice Course or not, have a read of this book and I'm sure you'll decide to have a go.

The next book should be read in conjunction with the one mentioned previously. The *Novice Radio Amateurs' Examination Handbook* starts with the question 'What is amateur radio?' and goes on to discuss the Novice Licence, the course you'll follow and the technical information you should understand to enable you to

complete the course and the Novice exam successfully.

Finally, for the Novice, there's the book *Revision Questions for the Novice RAE*. This book prepares you for the exam paper you face at the end of the course.

The answers to questions are supplied in the book so you can look them up if you should get stuck, but at least it gives you an idea of what to expect. Don't try and answer the questions in this book as soon as you start the course... you'll just get disheartened. Wait until you have the end of the course in sight and then start practising the questions.



All of the books mentioned or telephone the Credit

You don't have to attend a college course to sit the exam. You can study at home, or study with a group at a local radio club or perhaps a group at your local radio shop.

When trying to decide where you study for the RAE, there are lots of things to think about. There's the cost of studying at college - but then you should need less text books as you are paying for the services of a tutor.

If you study at home you will either need to use a home study course (see adverts in *PW's* classified section for details). Or you'll need to set yourself up with plenty of text books (more about these later).

If your local radio club runs an RAE course, this can be an economic way of studying. It has the benefit of providing a suitable tutor and back-up help from other knowledgeable members. Also the number of people who can reach a weekly college-based course are fewer than those who can reach a course at a radio club.

If you opt for real home study by correspondence, you'll have to be very disciplined. It's no good sitting down with your books one week in six...well I'm busy at work, too tired, the garden needs doing, etc. This won't do!

You must set aside time each week and you must work. This can be most difficult when you get stuck trying to understand a subject.

If you are studying with other people, then it's easy to ask questions either of the tutor or of other students. It can also be reassuring to find out that you aren't the only one who doesn't understand resonance, for example.

There are several home-study courses that help you work at a steady

pace and provide you with the services of a tutor by post. If you live in a remote area and can't get to a college or radio club on a regular basis then this is an ideal way to pace yourself through the study course. (*We hope to have an article from a very experienced correspondence course tutor soon. It should prove helpful to students and tutors!* Editor)

If you decide to just work with various text books at your own pace, which ones do you choose? You'll need at least one text book no matter which method of study you choose.

Books Available

The range of books available for the RAE is enormous, looking at a recent copy of *PW's* Book Service pages, I counted no less than 11 different study manuals of one sort or another. The list in *PW* is not all of them either, a trip around a large book shop or a radio rally will unearth a few other titles too.

So, what books would I recommend most? And to start if you are looking towards a Novice licence, there are three books I would recommend you investing in, and they cost less than £16 for all three.

(If you have had to buy books for a full-time college course recently then you'll appreciate that these books are very reasonably priced when compared to that kind of text book).

A or B Books?

If you are going to study for an A or B licence, then there are four books I have picked out and I'll go through them in the order of importance (my opinion!). These four books are more expensive than the Novice selection, as all four will set you back £33.

The first book I would recommend depends on how much you know about amateur radio. If the answer is very little then I think you need to do some background reading before you launch into the theory. You need to get an overall picture of what's involved in the hobby of amateur radio before spending too much money on books and equipment.

At £3.50 *Amateur Radio for Beginners - How to Discover the Hobby* is a good way to find out more about things. It covers everything from rallies to building a simple receiver and jargon to getting your licence. All this is explained in easy-to-understand chapters, and as the book only runs to 64 pages it doesn't take that long to read.

Probably the most important book to spend your money on once you start studying is the *Radio Amateurs' Examination Manual*. Almost anyone teaching the RAE will recommend students obtain and thoroughly read this book.

Most of the courses follow this book and your tutor will help you understand parts should you get stuck. The book isn't written for a total beginner and so some knowledge will be useful when you use this book. Costing £7.99 I think this is one of the most useful books and very reasonably priced.

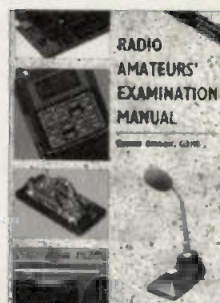
How to Pass the Radio Amateurs' Examination and The Radio Amateurs' Question and Answer Reference Manual are the final two books in my selection.

The first book helps by explaining multiple choice papers and how best to approach them as well as providing sample questions. The second book also is full of sample questions and answers. Both of these books are great to get you ready to sit the exam. At £7.00 and £13.95 respectively, it's up to each student which one they buy.

I hope this has given you some idea of the process involved in getting an amateur licence and perhaps shown you that it isn't as difficult as you may think. You will have to work for it, but the eventual rewards are well worth the effort involved.

Personally, I would recommend you doing the course in a class with other students, whether at a college or with a radio club is down to personal preference. It's much easier to study with other people, you can compare notes and get moral support when you feel you are the only person in the world who doesn't understand something.

Also having to go along once a week for a lesson is good discipline too, but easier than trying to study alone. Of course, sometimes studying alone is the only option open, if that's the case then there's no reason that you won't pass. Good luck whichever option you choose.



That's all the 'natterings' for this month so, until next time cheerio

*and keep those letters and ideas coming to me at PO Box 1863,
Ringwood, Hants BN24 3XD.*

Elaine G4LFM

ed by Elaine G4LFM are available from the PW Book Service. To order either use the form in this issue
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CLUB Spotlight

Compiled by Zoë Shortland

Radio Boot Sale

On June 16 the **Newbury & District Amateur Radio Society** are holding their 9th Annual Radio Boot Sale at the Recreation ground, Cold Ash, Newbury, Berkshire. The site is just under two miles from the A4/A34 road junction and is well signposted.

Admission and parking is free for buyers and a generous plot will be available at £8 to those selling. Access allowed to the site for setting up from 8am.

Refreshments/toilets /disabled parking and children's playground on site. Talk-in with GB4NBS on S22.

Further information from **George** on (01488) 682814.

Dragon Club Celebrates Special Event Station

In celebration of the 700th anniversary of the granting of a Royal Charter to the Welsh Town Borough of Beaumaris, a Special Event Amateur Radio Station **GB4BEA** will be held on Saturday and Sunday 18/19 May 1996.

In co-operation with North West Venturers Yacht Club the station will be operated from the foreshore green at Beaumaris. It will be active on both s.s.b. and c.w. for the proposed times - from 0001UTC on May 18 through to



Back row shows **Jeff Travers GW4UVN**, **Mal Warner GW0KYY**, **Brian Parsons GW0KZK**. The front row shows **Denzil Evans GW3CDP**, **Carl Mason GW0VSW** and **Jim Stanbury GW0BBO**.

1600UTC on the 19th.

Although the station will operate mainly on the 3.5, 7 and 14MHz bands (on 14MHz the frequencies will be 14.270 and 14.050MHz \pm QRM), depending on the propagation conditions, other h.f. bands will also be used. A 144MHz v.h.f. station will also be operated on S22 as a local link and to guide any mobile visiting amateurs to the site.

It would be of particular interest if amateurs worldwide with connections or family ties with Beaumaris and the surrounding area of Anglesey could contact this special event station.

Further information can be obtained from **Dewi E. Roberts GW0ABL**, 23 **Lon Hedydd**, **Llanfairpwll, Ynys Mon, Gwynedd LL61 5JY** or (01248) 713647.

Close Range Amateurs

Of the six South Wales based radio amateurs shown in the photo, five live within two minutes walk of each other in Skewen, and **GW4UVN**, **GW0KZK**, **GW3CDP**, **GW0BBO** and **GW0VSW** are close neighbours. The photo was taken in **GW0KZK** Brian Parson's shack and also shows **Malcolm GW0KYY** who is a regular visitor. They are all keen h.f. operators and keep in touch using a variety of 144MHz rigs.

Club Spotlight would also like to hear from other 'neighbourly' groups - send your information to Zoë.

Birthday Party For Samuel Morse

The 205th birthday party for Samuel Morse is to be held at **Greater Glasgow Scout Group Activity Centre, Auchengillan Scout Camp, Blanefield G63 9AU** on Saturday 27 April 1996, 10am to 8pm, courtesy of Greater Glasgow Scout Group &

West of Scotland ARS.

All amateurs are welcome for a coffee and a piece of birthday cake. Bring your own pet Morse key. If you can't look in, call us on 3.5, 7 and 14MHz. The special event station call is **GB4SAM**.

Travel directions: East side of the A809 Glasgow to Drymen Road, 400m north of junction B821 Stonyburn to Blanefield Road. Heading out of Glasgow, just north of the Carbeth Inn, approx distance from Glasgow 9 miles (14kms). Talk-in on S22.

Find out more by contacting **George Allan GM4HYF** (Hon. Sec.) on 0141-634 4567.

Twin Event Days

The **Plymouth Radio Club** will be holding their annual rally this year on May 25 & 26th. The twin event days will celebrate the 70th birthday of the club.

The club have set-up a complete family day of fun and entertainment for each of the two days, and there will be enough to occupy the family all day. The special event callsign is **GB4PLY** which will be on the air on all bands, h.f. to v.h.f. for the entire weekend.

Special QSL cards have been prepared, which will be serial numbered, and only available for this event. The Electronics Fair, or Radio Rally as we know it, will be of interest to other hobbies such as computer clubs, radio modelling clubs, model railway clubs, in fact any hobby which requires

electronic equipment.

Sounds interesting? Find out more details and directions from **John Doherty G7HIK** on (01752) 896501. Replies on packet will also be welcome - **G7HIK @ GB7PAB**.

Breaking The 'Mould' Of Mobile Rallies

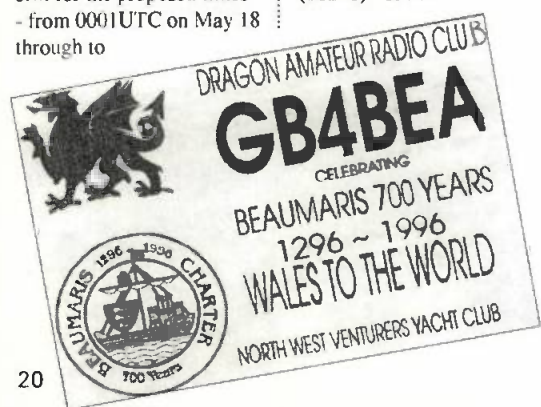
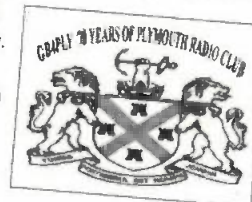
One of the South's major rallies will take on a new look in 1996. The **Royal Navy Amateur Radio Society** is combining its 36th rally with the annual RN Field Gun Day on Saturday June 15 at 1.30pm in **HMS Collingwood, Fareham, Hampshire**.

The Rally Organiser, Lt. **Cdr. Tom Biddlecombe G3WAO** says, 'Many mobile rallies, including the RNARS event, has become rather predictable and boring (and 'mouldy') to all, except the for the few dedicated bargain hunters. The move to a Saturday and combining with a major public event that regularly attracts up to 5000 people is a gamble.

However, the aim is to offer a day out for all the family with everything to be found at any other rally plus a feast of attractions, displays and

entertainments which should ensure that roles are reversed - the amateur will have to drag his family away at the end of the day!'

The event is held inside **HMS Collingwood**, one of the RN's primary training establishments. Regulars will find all the usual RNARS rally features of traders and attractions plus the bonus of access to the





Some of the teams running in the Field Gun competition.

Society's HQ Station GB3RN (FT1000, linear amp, 6-element tri-bander at 60' or 14-element 2m beam at 80') watching the fiercely fought Field Gun competition with teams from all the Naval establishments running from the Brickwood's Trophy, displays by marching bands, motorcycle display teams, military bands, historic aircraft fly-by, an old fashioned carousel and extensive children's play area.

All funds raised will go to Naval and local charities. The RNARS also hope to capitalise on the opportunity to present amateur radio to the public and all traders and supporting societies will be encouraged to pitch their stands accordingly.

Further details regarding the rally can be obtained from **Tom Biddlecombe G3WAO, QTHR**, on (01329) 665757, FAX: (01329) 667373.

Oulder Hill Radio Society

The **Oulder Hill Radio Society** is three years old and has 60 members. It is now resident in the **Oulder Hill Community School, Hudsons Walk, Rochdale**, four minutes from the M62 J20, so is accessible from the whole of the North West, ie. 20 minutes to Huddersfield or Warrington.

Meetings are held on Mondays 7-9.30pm, but the bar is open till 11pm. The club is also a registered examination centre and holds free courses in the Novice and RAE. All the courses are on-going and are taught by professionals, hence the 90% pass rate!

The society offer the exam facilities to external candidates. They come with a host of night school and sporting facilities for you and your family, ie, swimming, squash, aerobics

and flower arranging, etc.

Club members cover all interests and activities. Events are held regularly, talks, visits, direction finding and contests. Find out more from **Chris Jenkins G0VRX** on (01706) 45522 or **Alan Gale G4TMV** on (01706) 344186.

The Ugly Expedition Group Are Back!

Yes, the Ugly Expedition Group (**G7UEG Northern VHF Activity Group**) are in the process of planning their latest epic journey to the Orkney Isles.

Following their successful trips to the Western Isles, they have decided to go a little further north for '96, Orkney. Operation will be on 50 and 144MHz and after being let down with the loan of some 430MHz equipment in 1995, they are still on the look-out for the loan of some reliable 430MHz s.s.b. equipment for 1996.

The callsign which will be used is **GS7UEG/P** on the v.h.f. bands and they will also be operating on the h.f. bands, using the callsign **GMONES/P**. A base station will be set-up on the island of South Walls, which is joined to the island of Hoy, by a causeway. The exact location is the lighthouse at Carnick Head, IO88KT WAB area is ND38.

Once again the group will be offering their Ugly Expedition Group Award. To claim this wonderful award, all you readers have to do is work the group on three or more islands, any band, h.f., v.h.f. or mixed bands. The group also require a log extract and a cheque for £3 made payable to **P. Austin**. QSL cards are not needed. The award is available from **G7BXA** who is **QTHR**.

Peter Austin (Chairman) has sent a lot more information, but space prevails! So, if you want to find out a bit more about the latest journey, contact him on **0113-256 3462** after 2pm if possible. Or contact **G7DKX @ GB7GBY** on packet.

Fell To Fame

Roy Andreang G4CMT of Hull fell to fame when on his 55th birthday of April 6 1979 he made the first parachute mobile contacts with radio amateurs who were lucky enough to get through the clamouring crowd. Roy didn't do this just for fame, he did it for a particular reason.

Roy is a personality, very well known for his kindness and help to others including the scout groups. He finances himself on all his projects and parachuting is not cheap.

Every penny that he has raised and that is thousands of pounds, have gone to causes in need, more of which will be mentioned in a later issue of *Practical Wireless*. The photograph shows him as the Town Crier, which was taken

Zoë says:
"keep the News and those Club magazines coming!"

during a Victorian weekend when a parade marched from the Kingston Upon Hull Holy Trinity Church to the home of William Wilberforce MP, who abolished slavery in the UK.

Roy also created the Scout Order State Headquarter Training Centre at Raywell Park, near the outskirts of Hull. So far, Roy, with the help of **Don GOUBY, Len G6JFJ** and other Raynet operators have set-up h.f. and v.h.f. stations whilst **Andy G6ZTI** has installed a Packet station. All the stations have the callsign **GOVRM**.

At the age of 72, Roy's next, the twelfth and last parachute mobile QSOs are scheduled for June 1 at the RAF Topcliffe Station, near Ripon, North Yorkshire, depending, of course, on



Roy Andreang G4CMT as the Town Crier during a Victorian weekend.

possible situations such as unknown RAF arrangements and weather, etc.

If all is well, Roy will be operating c.w. and 'phone on 2m (144MHz), channels 21 and 22. He's appealing for funds to further enhance the Scouts Training Centre at Raywell Park and any donations will be appreciated, particularly from the few that will have the pleasure of working a /PM.

Spotlight Trophy

David Barlow G3PLE has great admiration for Amateur Radio Club magazines and newsletters - and the people who put the hard work into producing them. So David, a retired Marketing professional and former member of the Birmingham Press Club who now lives in Cornwall, wrote to the **Rob Mannion**, Editor of *PW*, and **Zoë Shortland** suggesting a special trophy for the best Radio Club Magazine or newsletter.

Rob and Zoë thought David's idea was an excellent way of encouraging the (often hard-pressed!) magazine and newsletter editors. **Dave Wilkins G5HY of Kenwood (UK)** Ltd. thought so too! The result is that a new award, The Spotlight Trophy, Awarded To The Radio Club Magazine of The Year by *Practical Wireless* and Kenwood (UK) will be presented at the Leicester Show in October.

So, let's see your magazine, whether it be weekly, monthly quarterly, glossy, duplicated A4, PC produced or whatever. They're all of interest and yours could win!

To enter your Club Magazine for the award, send two of your most recent club magazines and details on how they're published, to the *PW* Editorial offices at the very latest by **Monday 22 July**. Remember to mark your envelope 'Spotlight Club Magazine Competition'.

The panel of judges: **Dave Wilkins G5HY**, **Zoë Shortland**, **Jim Bacon G3YLA**, **David Barlow G3PLE** and the Editor are looking forward to reading your club's magazine! Get busy, the spotlight's on!

Send your club information to Zoë Shortland at the *PW* Offices.

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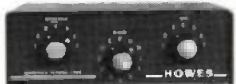
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HA150R hardware: £16.90



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SWB30 SWR Bridge
1 to 200MHz. Kit: £13.90
ST2 Side-tone Oscillator.
Key or RF operated. kit: £9.80
CA30M hardware: £34.90

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73 from Dave G4KQH, Technical Manager.



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Professional HF Transceiver



By Mike Devereux G3SED

Mike Devereux G3SED, is well known as being Managing Director of Nevada Communications in Portsmouth, a Kenwood dealer and a keen operator of Kenwood equipment. Mike's also known as a very keen and active h.f. operator and 'Camel Trophy' DXpeditioner extraordinary. Because of this, it seemed to me that Mike was the ideal choice to provide an unusual 'take a look over the fence' review of a Kenwood transceiver designed for professional, non-amateur radio use.

Editor

Reviewing a transceiver intended for the commercial h.f. market in an Amateur context is not the simplest task.

Commercial radios are usually designed for use by the inexperienced operator and need to meet a different set of criteria.

Commercial use of radio communications can be split into a number of categories: marine, aeronautical, mobile, base station and point-to-point. Each category has its own requirements and in many parts of the world will require type approval.

Type approval is intended to ensure that the equipment will not cause undue interference to other radio users while meeting limits on power, frequency stability and spectral purity. From an Amateur perspective type approval is not usually a consideration, but for the commercial manufacturer meeting these approvals can add considerably to the costs.

The Kenwood TRC-80 is aimed more at the Third world countries where cost is an important factor. Equipment for this market takes into consideration type approval standards, but does not necessarily have to meet them. In this way prices can be kept low. The TRC-80 sells for around £995 (plus VAT), which is inexpensive by

KENWOOD TRC-80

commercial standards.

When the Editor invited me to review the new Kenwood TRC-80, I was keen to see how Kenwood would address the commercial requirements. As an enthusiastic Radio Amateur I could not resist the chance to compare the TRC-80 with the h.f. amateur band transceivers that I have used for many years.

Exciting World

During the past five years I have been lucky enough to install and operate radio systems from many exciting parts of the world. These have included the Jungles of Sabah Malaysia, Northern

Argentina, and Central America to the remote Atacama Desert of Northern Chile.

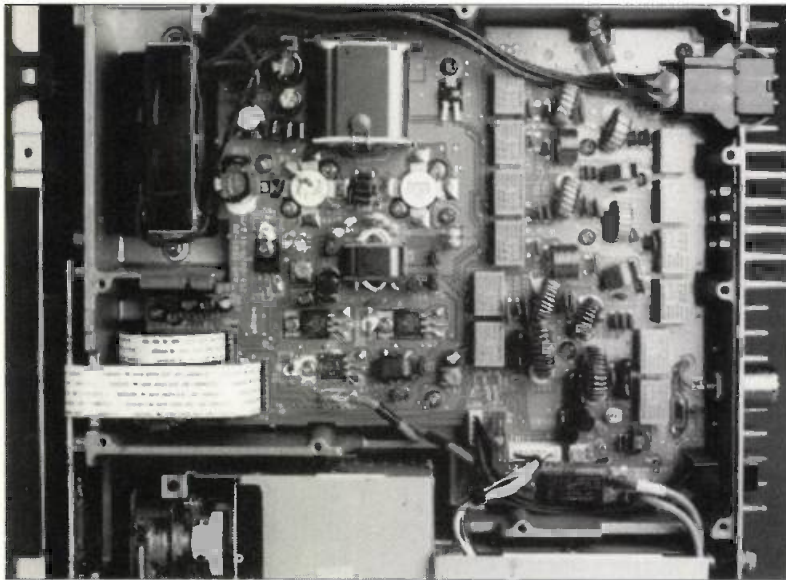
My work involved the supply of radio equipment to non-skilled operators, who used the radio for both emergency communications and long distance telephone system. It's in these situations that you appreciate the need for reliability and simplicity. If there's a knob that can be broken or pushed in error they will do it!

Taking the TRC-80 out of its box for the first time, I was struck with its uncluttered front panel and solid construction. The commercial non-professional user does not want all the 'bells and whistles' that the Radio Amateur looks for, consequently the front panel has been kept simple.

The four control knobs are unobtrusive but easy to



TRC-80 review



Inside view of the TRC-80.

access for **Volume, Squelch, Clarifier, and Main Tuning** adjustments. The recessed front and use of push controls ensure that the risks of protruding parts being broken when used in a vehicle or out in the field is minimised.

The simple front panel layout has provided room for a relatively large forward facing speaker, which is perfect for use in a vehicle. I have always found that top facing speakers cause significant loss of intelligibility when used in a noisy environment.

Larger Transceiver

The TRC-80 is somewhat larger in size than Kenwood's TS-50 popular mobile Amateur Band transceiver. I felt, for mobile use, the TRC-80 was more rugged and would stand a lot

more wear and tear.

However, the larger sized TRC-80 could present problems when trying to fit the unit into a vehicle. (The mobile mounting bracket for the TRC-80 is an optional accessory).

The TRC-80 can be pre-programmed by the dealer to allow either channelised operation or general coverage from the main tuning dial. This is because in most commercial situations very few channels are required (possibly two channels for daytime and two for

night time).

Operating channels need to be programmed into memory for most commercial applications. Direct frequency entry can be catastrophic where the untrained user inadvertently knocks the dial or moves off channel and then forgets the operating frequency!

Scan Modes

Two scan modes allow either a time-operated or carrier operated scan of the memory channels. When a large number of frequencies are in the memories it is possible to lock some out of the scan using the menu mode.

The TRC-80 has a 'cloning' facility via one of the accessory ports that allow any number of radios to be quickly programmed to the same

frequencies. If you have ever been stuck in a jungle and faced with changing a large number of radios to a new frequency allocation in a hurry, you'll now just how useful this can be!

Radio First - Handbook Second

I don't know about you, but I'm one of those awful people who after 33 years as a Radio Amateur will switch a new radio on first and read the handbook second (the TRC-80 was no exception!). I hooked it up to my large 1.8MHz inverted L antenna, connected the 12V power supply and

switched the set on.

The radio sprang into life and I was quickly able to find my way around without problems. Tuning steps of 10Hz, 1kHz and 100kHz are selected via the **Scan** button. For amateur use it would have been more convenient to have a 100Hz step included.

I tuned in to the 'Ragchewers' Net on 1.8MHz. I then found the received audio quality from the front facing speaker was excellent, almost identical to that of my Kenwood TS-930.

Plugging in the supplied hand microphone, I joined the 'Top Band' Net and found that I had to talk very close to the microphone to achieve reasonable output power. **John GOLTJ** in Solihull, commented that the audio sounded clear and very readable but it was only "communication" quality when compared to my TS-930's "outstanding" audio.

In response to John's comments I did a quick test and plugged in my Kenwood MC60 amplified desk mike to the TRC-80. Then neither John nor the other members of the Net could tell the difference between the TRC-80 or my TS-930.

Over the years I have constantly had reports of outstanding transmit audio quality from the TS-930, and obviously the TRC-80 with the MC60 microphone was an excellent combination. (But I later found that the microphone gain on the TRC-80 can be set via the menu mode - so next time I promise I'll read the handbook first!).

Independent Receiver Tune

The TRC-80's Independent Receiver Tune (IRT) control allows for a ± 1 kHz shift as opposed to the typical Amateur Radio transceiver's five or ten kHz.

The 1kHz available on the TRC-80 is actually generous! Some commercial transceivers only offer 100Hz. If you have ever placed a call through Portishead radio you will know that a frequency error of just 50Hz can generate comments from the radio operator that you are 'off frequency'. (It's certainly a different world!).

The TRC-80 has a very straightforward display showing either channel number, channel number with frequency, or when in VFO mode, frequency alone. When the clarifier offset is used 'CLAR' is

My thanks go to **Trio-Kenwood (UK) Ltd., Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB, Tel: (01923) 816444, FAX: (01923) 212477** for the loan of the review model, which is available from Kenwood approved dealers for **£995 plus VAT**. Accessories for the TRC-80 include:

Accessories	Order Code	Price (ex. VAT)
External Automatic a.t.u.	KAT-1	£495
Internal Automatic a.t.u.	KAT-2	£195
Low Pass Filter	LF-30A	£39.11
Mobile Mounting Bracket	MB-430	£17.83
RS-232 Computer Control Interface	IF-232C	£75.70
SSB Filter (2.7kHz)	KIF-1	£39

KENWOOD

displayed on the l.c.d. panel to alert the operator.

Both signal strength and power output are displayed by means of an easy-to-see bar graph showing received strengths to S9+40dB and 0-10 for power output. This received signal strength is not the norm in the commercial world as a report of 5 by 5 signifies the same as our Amateur Radio 59 report.

In use, the TRC-80 can deliver 100W at full output. It has three power output settings: **High, Medium and Low.** These may be preset from the menu mode or restricted by the dealer.

One Antenna

In commercial applications you often have only one antenna to cover all your operating frequencies. A single whip is often used on a vehicle or a broadband wire, if working from a fixed location. The TRC-80 on review had the (optional) automatic antenna tuning unit (a.a.t.u.) fitted and provision for an external auto a.t.u.

The built-in a.t.u. worked well across a wide range of impedances. On average, it took between 5 to 10 seconds to match a simple antenna on most frequencies.

The remote a.a.t.u. facility is particularly useful. Most remote tuners now have memory facilities that can recall the last settings for a given frequency almost instantaneously.

Whilst working on Camel Trophy the Teams used a remote a.t.u. to tune the base of an 2.5m whip mounted on the back of their Land Rover Discoveries. We were using frequencies from 3.5 to 12MHz and achieved ranges up to 1200km with this combination.

Selective Call

The TRC-80 has a selective call option a facility not seen on Amateur h.f. transceivers. The selective call allows for both station identification and individual calls. This is an excellent option since a Commercial user does not want to listen to all the noises that lift the squelch.

Squelch circuitry in the TRC-80 is of the traditional type that lifts on signals exceeding a pre-set level. But it's a shame Kenwood did not use some kind of voice pattern recognition squelch.

My experience has been that in a noisy environment it's not uncommon

for operators to turn down the volume to escape all the extraneous noises. And in doing so they don't hear the calls!

Morse Facility

As a keen 'Morse Man' I was delighted to see a c.w. facility on the TRC-80, but a little bemused as to who might use it in a commercial application these days! The c.w. sidetone is selected via the menu mode with a jack socket being provided for the Morse key.

I had a few contacts on 3.5MHz c.w. and found the note to be clean and reception surprisingly good. However, for serious cw. use an optional 500Hz filter is available.

In the modern world it's much more likely that the TRC-80 would be used for data transmission. To this end provision is made for both ASK and FSK data modes via a data button on the front panel

General Coverage

The receiver has general coverage as standard and on the review sample TRC-80 it was possible to receive from 100kHz through to 29.99999MHz. The radio transmitting coverage ranged from 1.604 to 29.99999MHz.

I used the TRC-80 on the Amateur bands for a number of days on both c.w. and s.s.b. I found the radio very easy-to-use with excellent audio quality.

The receiver was very sensitive. The TRC-80's performance compared favourably with traditional Amateur band transceivers accepting that some of the 'bells and whistles' were missing.

The TRC-80's size and front panel layout make it an ideal base station radio. For mobile use the large front facing speaker gave good clarity.

I felt the radio was a little large for mobile mounting when compared to Kenwoods TS-50 and Icoms IC-706 Amateur equivalents. However, the TRC-80 was more ruggedly built. And I shall certainly recommend the TRC-80 next time I am involved in an overseas operation.

PW

KENWOOD TRC-80

Manufacturer's Specifications

General

Transmitter frequency range	1.8 - 2.39999MHz 3.5 - 4.49999MHz 6 - 7.99999MHz 11 - 14.49999MHz 16 - 21.49999MHz 24 - 29.99999MHz
Receiver frequency range	500kHz - 29.99999MHz
Modes	J3E(s.s.b.), A1A(c.w.), A3E(a.m.), F1D(FSK), F2D(AFSK)
Operating temperature	-20°C to +60°C
Power requirement	13.6V d.c. ±15% (negative ground)
Current consumption Receive	<1.45A
Transmit	<20.5A
Frequency stability	-10°C - +50°C, within ±10p.p.m. -20°C - +60°C, within ±15p.p.m. -10°C - +50°C, within ±0.5p.p.m. (with SO2) -20°C - +60°C, within ±1p.p.m. (with KPE-1)
Antenna impedance	50Ω
Dimensions	270 x 96 x 271mm
Weight (net)	5.2kg

Transmitter

Power output	100W
s.s.b./c.w./FSK	25W
a.m. (unmodulated signal)	>40dB
Carrier suppression	
Unwanted sideband suppression	>50dB (1kHz)
Microphone impedance	600Ω

Receiver

Circuitry	Double conversion superheterodyne
Intermediate frequencies	
1st i.f.	73.045MHz
2nd i.f.	10.695MHz
Sensitivity	
s.s.b./c.w./FSK (10dB S/N)	<4μV(0.5 - 1.79999MHz); <0.25μV(1.8 - 29.99999MHz)
a.m. (10dB S/N)	<3.2μV(500kHz - 1.79999MHz); <2.5μV(1.8 - 29.99999MHz)
Spurious response	
i.f. image ratio	>70dB
i.f. rejection	>80dB
Selectivity	
s.s.b./c.w./FSK	>2.2kHz (-6dB) <4.8kHz (-60dB)
a.m.	>5kHz (-6dB) <40kHz (-60dB)
c.w. (with YK-107C)	>500kHz (-6dB) Less than 2kHz (-50dB)
Clarifier variable range	±1.1kHz (10Hz step) Dealer setting: ±110Hz (1Hz steps)
Audio output	>3.5W (4Ω at 10% distortion)
Audio output impedance	4Ω

The Handy From Tandy - Revisited

By Mike Hadley G4JXX

Mike Hadley G4JXX has other more modifications to the very popular 'Handy From Tandy' QRP 49 to 50MHz conversion transceiver published in PW in 1995.

The original 'Handy From Tandy' article (*PW* April 1995 by Peter Julian G7PRO) describing modifications on the Tandy TRC501 f.m. transceiver, and conversion from 49 to 50MHz was a deservedly popular project in *PW*. For only a few pounds anyone who wanted a low powered transceiver for use on 50MHz could convert a very reasonably priced transceiver from 49MHz and have a great deal of fun.

My modifications to the TRC501 start with a change to the zener diode voltage on the regulated supply voltage to the first oscillator. This is necessary to ensure that the oscillator 'kicks off' every time the unit is switched on.

Fault Discovered

I carried out many experiments using faults discovered on 'customer returned' TRC501s. Many of the faults were discovered to be due to insufficient voltage supply to the first receive oscillator.

Increasing the first receive oscillator's voltage supply corrected the fault. Modification and repair was easily achieved by

adding a silicon diode (1N4148 suitable) in series with the existing zener, as shown in Fig. 1.

The increase in voltage of about 0.6V doesn't sound much, but it is sufficient to consistently 'kick start' the oscillator each time it's switched on.

Front-End Change

I suggest a further receiver front-end change to Peter Julian's original circuit, shown in Fig. 2. The circuit I've adopted is shown in Fig. 3 and it's recommended as it provides greater protection to the r.f. amplifier circuit.

The reason for greater protection is because of higher r.f. output power that these modifications provide. It also



Test Notes from Clive Hardy G4SLU

I tried the receiver front end modifications on the TRC501, the modifications seem to work okay but definitive results are difficult to check without suitable test equipment.

As regards the output power Peter G7PRO's original modifications provided approximately 50mW output. Mike G4JXX's modifications provide just under 90mW. (The two transceivers I modified produced 88mW). This represents almost a 3dB power increase which is quite remarkable.

G4SLU

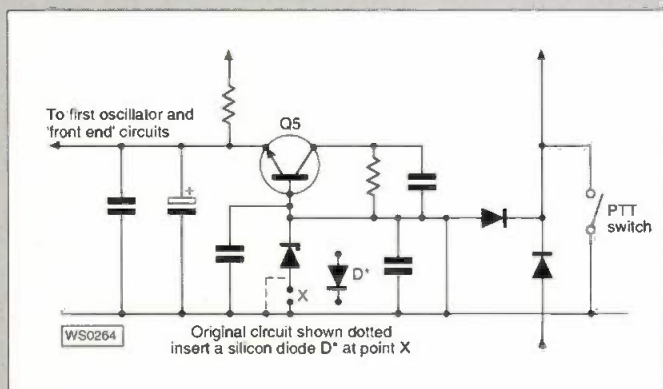


Fig. 1: Inserting a silicon diode (1N4148 suitable) in series with existing Zener diode on the first receive oscillator, greatly improves the oscillator 'start up' (see text).

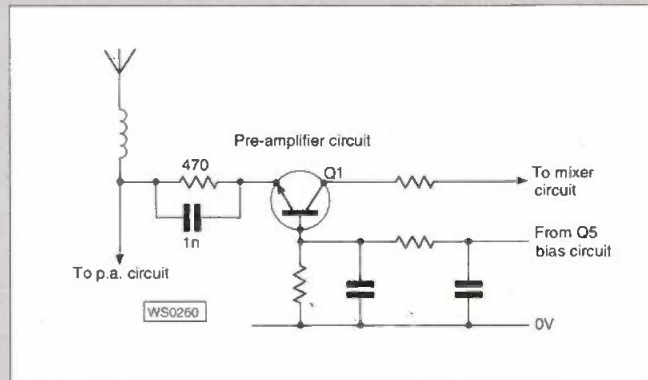


Fig. 2: Existing circuit of receiver front-end (see text).

Practical Wireless April 1995 Back Numbers Available

Anyone planning to convert a Tandy TRC501 will be pleased to know that we have back numbers of the April 1995 issue of *PW* available for £2.50 from the post sales department in Broadstone. To order your copy using a credit card, please call either **Shelagh** or **Michael** on (01202) 659930. Or you could send a cheque for £2.50 to the post sales department asking for an April 1995 back issue of *Practical Wireless*.

reduces the loading on the transmitter power amplifier (p.a.) stage, which in itself increases the overall output power.

Output Power

A substantial increase in output power can be realised by changing the biasing of the transmitter output stage on the TRC501. This is achieved by removing the simple single 100kΩ resistor biasing (R83), and replacing it with a 'normal' potentiometric biasing.

The diagram, Fig. 4, shows the original modification as suggested by G7PRO. The further modification I'm suggesting is shown in Fig. 5.

The new biasing consists of changing the original resistor, R83, to 2.7kΩ (shown as R2 in the circuit here), and then adding

a 1.2kΩ resistor (shown as R3 in my circuit) from the base of Q9 (the p.a. transistor) to 'ground'.

Keeping the 56Ω emitter resistor (please refer to Fig. 5) and associated bypass capacitor improves stability. (Note that it will be necessary to retune L6 and L5 after this modification).

Field Trials

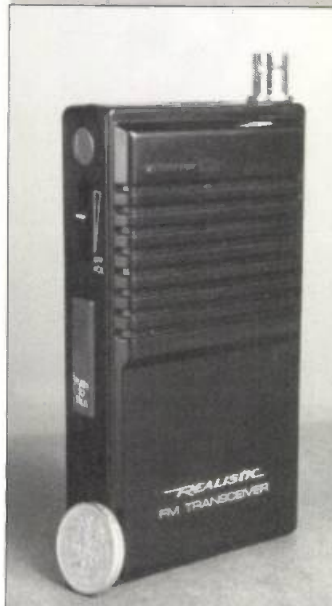
In the 'field trials' (they were actually done in open fields!), two modified TRC501s were tested using the original telescopic whip antennas. In the flat countryside a distance of almost three quarters of a mile was achieved (using 51MHz of course!).

If you carry out further modifications to the 'Handy From Tandy' I'd be pleased to hear from you. Have fun on 'Fifty f.m.'!

PW



After the modifications suggested the 51MHz Handy-from-Tandy could look like this. With a change of antenna and as much as 90mW of r.f. power communication range goes up to over a kilometre.



The sight that meets you when you open the case of the TRC501 transceiver. The transmitter circuitry is in the low right hand side of the circuit board.

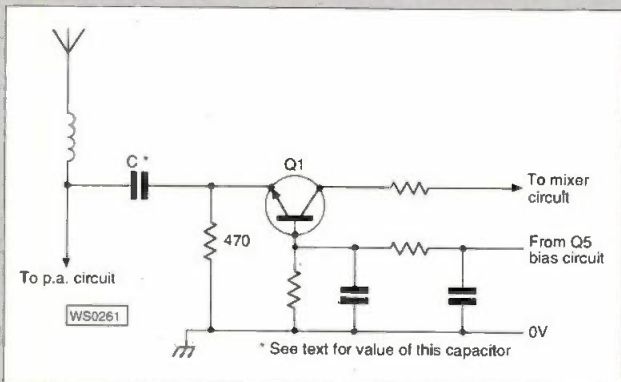


Fig. 3: The modification to the receiver input circuitry suggested by G4JXX. Capacitor C* should be about 22 to 47pF, G4JXX found 33pF was the best.

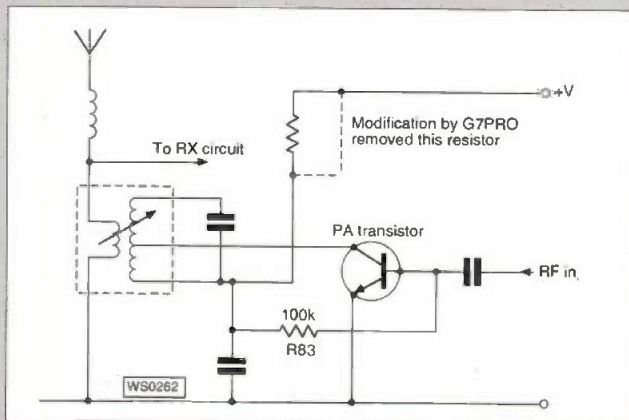


Fig. 4: Original modification as suggested by G7PRO in *PW* April 1995 merely removed the current limiting resistor. This gave a small improvement in output power.

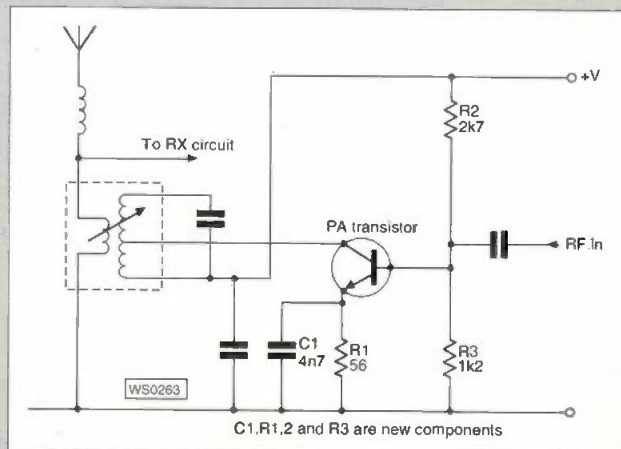


Fig. 5: Further modifications suggested by G4JXX, as shown, resulted in an almost doubling of output power.

DJ-190

VHF FM Transceiver

By Elaine Richards G4LFM

'Novice Natter' author Elaine Richards G4LFM takes time out to look at Alinco's latest v.h.f. 'easy-to-use' hand-held.

The Alinco DJ-190 is a v.h.f. 144MHz (2m) f.m. hand-held transceiver that fits nicely in the left hand - obviously meant for those right-handed amateurs! Anyway, it feels suitably solid despite its small size and stood-up well without falling over on the table whilst I was writing this review.

It sounds good too, whilst I was sat working I often left the rig set to the 'local' repeater, GB3SC, and listened as people were driving home from work chatting. I heard several old friends, G6DUN and

easy-to-read display panel. When you first switch the DJ-190 on it displays the receive frequency, if a signal is heard then it also displays the word BUSY plus a number of stars depending upon the strength of the signal received.

The DJ-190 instruction book also describes the wide variety of variables that the operator can set, for example the frequency steps, squelch level and power setting. I'll talk more about these later.

The display panel is so easy to understand that I was tempted to follow my usual route and carry on trying to use the radio without looking at the instruction book. This was all very well for just tuning around the band and for transmitting on the Simplex channels, but I came unstuck when I wanted to change some of the settings.

The top panel is unusually uncluttered with just a frequency change control and a TX/RX green l.e.d. Underneath a neat rubber cover are the connections for a speaker microphone.

The frequency change control has a definite 'click' as you rotate it clockwise to increase the frequency (and vice versa to decrease). When you get to the top end of 145MHz the display reverts to the bottom end of 144MHz, so the movement of the control is continuous.

The antenna, a 'rubber duck' type, looks as though it is tough and water resistant. This should keep water out of the BNC socket if you take the radio out in the elements when operating portable.

Controls

The most visible set of controls are on the front panel above the liquid crystal display (l.c.d.). You have the **Power** button and the **Up** and **Down Volume** buttons (these have other functions that will be dealt with later).

All three buttons are rather small, although it didn't present me with any problems whatsoever. But I would imagine if you have rather



large fingers that this may not be the case. The buttons need to be pressed firmly before they operate because they don't stand 'proud' of the case.

The side panel on the left-hand side is where the bulk of the controls are housed. Unfortunately, the markings are very difficult to read as they are actually embossed letters on the buttons.

The embossed letter idea would work if they were in a different colour to the grey rubber cover over the four buttons, but they're not. I'm also concerned that with time these markings will get worn away and make it even more difficult to work out which button does what.

The top button of the four is the **Function** button and like the function key on a calculator or the shift key on the typewriter, when depressed this gives a second meaning to most of the controls. The next button is much larger than all the others and is the **Push To Talk** (p.t.t.) switch, which has a really definite 'click' as you press it.

In fact, all the buttons leave you in no doubt that you've operated the switch. (It's nice to have a radio with such a positive action to these really small switches).

Button three is the **Back-light**. This is a toggle action switch so you don't need to keep your finger on it to illuminate the display. It is a very bright back-light that stays on for about five seconds before automatically switching off.

Finally the fourth button is a **Monitor** control. This effectively

Manufacturer's Specifications

General

Frequency coverage	144-145.995MHz
Channel spacing	5, 10, 12.5, 15, 25 and 30kHz steps
Memory channels	40 channels
Antenna impedance	50Ω
Frequency stability	±5ppm
Mode	F3E (f.m.)
Power supply	4.8-13.8V d.c. (4.8V d.c standard)
Current consumption	1.5A transmit, 50mA standby at 13.8V d.c.
Operating temperature	-10 to +60°C
Dimensions	57 (W) x 151 (H) x 27 (D) mm
Weight	300g with EBP-37N battery

Transmitter

Output power	5W (at 13.8V d.c.)/low: Approx. 0.3W
Modulation	Variable reactance f.m.
Microphone	Electret condenser type
Microphone impedance	2kΩ nominal
Max. deviation	±5kHz
Spurious Emissions	-60dB
Tone frequency	67-254.1Hz (50 selections)
Operating modes	Simplex/semi-duplex Offset 5kHz or 12.5kHz steps

Receiver

Sensitivity	better than -16dBμ for 12dB SINAD
Selectivity	> ±6kHz at -6dB, < ±12kHz at -60dB
Audio Output	>200mW in to 8Ω at 10% t.h.d.

G8YBT put out calls, but unfortunately with the hand-held indoors with the 'rubber duck' antenna I couldn't put a decent signal into the repeater - mind you I am some distance from it.

Uncluttered

One of the first things I noticed about the radio was the uncluttered array of controls and the large and

turns the squelch off whilst you have the button pressed. And as this radio has an electronic squelch control that you are likely to have set on the high side, this function is essential if you want to be able to quickly check for activity in the background.

Other Functions

Now let's look at the other functions that the buttons situated on the side-panel perform. Easy ones first! And to start if you keep the function button pressed down and press the back-light button, it now becomes the **High and Low power switch**.

The letter 'L' then appears in the bottom left-hand corner of the display to signify low power. But try as I might I couldn't find a way of pressing these buttons without using two hands and to begin with any of the functions were very awkward to do.

After a couple of days I did find that I got much better at operating the radio, and I also started to remember the various sequences to get the transceiver to do what I wanted. This made the whole operation seem much easier.

I also found if I turned the rig sideways on, it was much easier to operate the function buttons. Once you press the function key and get into the 'programming' of the radio, the volume control switches on the front panel take on new meanings. (They cycle through the various variables, like squelch, lockout, frequency steps, shift, etc.).

The control on the top of the rig, usually used for changing the frequency now changes the variable, for example increases or decreases the level of squelch. To begin with I needed to have the instruction manual handy to remind me what each bit did and



what I needed to do to change it. But like all these things, you get quicker in time and by the time I finished and gave the rig back I had mastered remembering the various codes and instructions.

It's quite a fiddly job changing the off-set for repeater working and then back to simplex working.

Practical Wireless, May 1996

Fortunately however, if you put your favourite working frequencies into the memories, then the shift, offsets, etc. you have set-up remain in the memory. As there are 40 memories, sitting down and spending a bit of time setting-up the various channels would be time well spent.

Scanning Frequencies

Once you've got some of your favourite frequencies stored in memory, you can make use of the DJ-190E's scanning functions. This is great for keeping an ear out for interesting contacts or maybe for a friend who may call on one of several channels.

You can alter the scan direction at any time and also choose to skip a number of memories. I was fascinated by the musical beeps that accompanied major frequency changes.

As you tune across a 500kHz point a single beep is emitted whilst a high/low combination of tones was used to indicate changing down 1MHz and low/high for changing up. Although a bit of a novelty, it had its uses when operating in poor light or in any situation where you couldn't see the display. If like me you find the tones a little irritating you can very easily disable them using the function key.

If you've owned a hand-held before you will at some time have suffered flat batteries when you forgot to turn it off. The DJ-190E has a solution to this problem in its auto power-off facility. This shuts the receiver down after 30 minutes without any buttons being pressed.

The other embarrassment to afflict portable operators is accidentally keying-up the rig - in your pocket or maybe a backpack. The solution here is to use the time-out-timer.

The time-out-timer can be set for any period between 30 seconds and 7.5 minutes. After this time the rig will automatically shut down and not be usable again for up to 15 seconds - this should do the trick nicely!

Easy To Use

I enjoyed using the easy-to-use DJ-190 hand-held, things have changed quite a bit since I first used my old IC-2E with its thumb-wheel switches some 15 years ago! I really did find it easy to use, but would suggest that anyone with large hands try the radio in the



showroom before making a final decision.

None of the controls gave me any trouble, but as I mentioned before I cut my teeth on the old IC-2E. Now that was a fiddly radio!

I would look seriously at a decent outdoor antenna for it, if the DJ-190 were going to stay here permanently. This would make a world of difference for local work and even for working through GB3SC.

I don't have the luxury of living on a hilltop, and in fact we are at river level surrounded by high ground! This does not make life easy when you only have a maximum of 5W, but the DJ-190 still performed fine and I was surprised with some of the signals it did pick up.

Optional Extras

There is an optional mounting bracket available. So you can install the DJ-190 in a car, which is what I would do. Incidentally, the transceiver features tone-burst as standard by the CTCSS decoder is

Many thanks to **Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835/204965, FAX: (01702) 205843,** for the loan of the DJ-190, which costs **£199.95** complete with NiCad battery, charger, helical antenna and belt clip.

There are many optional accessories which can be used with the DJ-190 here a few, together with their order codes and prices:

Accessories	Order Code	Price
CTCSS Decoder Unit	EJ-28U	£28.95
Earphone	EME-6	£10.95
Headset with VOX	EME-12	£49.95
Mobile Bracket	EBC-6	£16.95
Mobile Cigarette Lighter Adapter with active noise filter	EDC-36	£18.95
Speaker Microphone	EMS-9	£36.95

an optional extra.

The other optional extra I would consider is the speaker microphone or perhaps a head-set for in the car. The DJ-190 comes complete with a charging unit that I simply dropped the radio into each evening and it charged overnight ready for the next day's use.

PW

Left: The NiCad battery pack is supplied as standard with the DJ-190.



Left: The DJ-190 comes complete with charging unit.

WATERS & STANTON ELECTRONICS
A LEISURE & AUDIO COMMUNICATIONS

THE IC-706



'TOP TO TWO'

MARTIN LYNCH

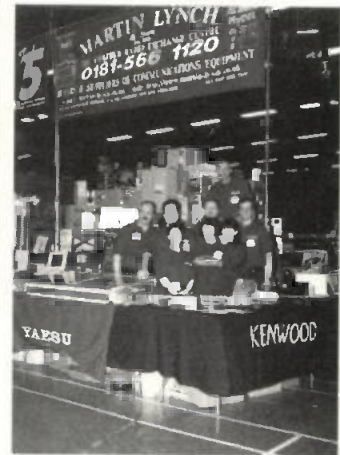
& Son

THE AMATEUR RADIO EXCHANGE CENTRE

AN ICOM IC-706 HF & VHF MOBILE TRANSCEIVER
WORTH OVER

£1000!

*donated by Martin Lynch & Son of the
amateur radio exchange centre*



Manufacturer's Summarised Specifications

General

Antenna Impedance	50Ω
Usable Temperature range	-10°C to +60°C
Frequency stability	Less than ± 7 p.p.m. from 1 to 60 minutes after power ON. After that, less than ± 1 p.p.m./hr at 25°C.
Power supply	13.8 v d.c. ± 15%
Current Drain	Transmit = 20A at 13.8V Receive squelched = 1.5A

Transmitter

Output Power	1.8-30MHz: SSB, CW, FM, RTTY 5-100W, AM = 2-40W 50MHz: SSB, CW, FM, RTTY = 5-100W, AM = 2-40W 144MHz: SSB, CW, FM, RTTY = 1-10W; AM = 1-4W
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Spurious emissions

1.8-30MHz:	Better than -50dB
50MHz:	Better than -60dB
144MHz:	Better than -60dB
Carrier suppression	Better than -40dB
Unwanted sideband	Better than -50dB
Microphone impedance	600Ω

Receiver

Sensitivity (pre-amplifier ON)	
SSB and CW	
1.8-29.9950MHz	<0.16µV (for 10dB S/N)
50-54MHz	<0.16µV (for 10dB S/N)
144-148MHz	<0.16µV (for 10dB S/N)
AM	
0.05-1.8MHz	<13.0µV (for 10dB S/N)
1.8-29.9950MHz	<2.0µV (for 10dB S/N)
50-54MHz	<2.0µV (for 10dB S/N)
144-148MHz	<2.0µV (for 10dB S/N)
FM(N)	
28.0-29.7MHz	<0.5µV (for 12dB SINAD)
50-54MHz	<0.3µV (for 12dB SINAD)
144-148MHz	<0.3µV (for 12dB SINAD)
FM(W)	
76-108MHz	<10.0µV (for 12dB SINAD)

In the February 1996 issue of *PW* Richard Newton GORSN reviewed the latest 'all in one package' mobile from Icom. He stated that as a keen mobile operator he'd be more than happy to own one - well now all *PW* readers have the opportunity to own an IC-706 by entering this easy-to-enter 3-part competition.

Martin Lynch pictured here with his team at the 1996 London Amateur Radio & Computer Show has very generously donated an IC-706 together with 10 of his T-Shirts printed with his logo as prizes for this very special competition.

FIRST PRIZE: IC-706, a Martin Lynch T-shirt & a three year subscription to *Practical Wireless*.

SECOND, THIRD & FOURTH PRIZES: A Martin Lynch T-shirt & one year subscription to *Practical Wireless*.

SIX RUNNERS-UP PRIZES: A Martin Lynch T-shirt

How To Enter

All you have to do is answer the three multiple choice questions below, all the answers can be found in this issue. Make a note of your answers and keep them in a safe place until next month (June) when we'll be asking three more questions. The final three questions will appear in the July issue of *PW* together with the entry form.

Questions

Q1: What is the maximum output power of the IC-706 when operating s.s.b./c.w./f.m./RTTY on 50MHz?

- A 100W B 40W C 10W

Q2: In which of *PW*'s regular articles this month is 50MHz referred to as the 'Magic Band'?

- A HF Far & Wide B VHF Report C Novice Natter

Q3: Which international broadcasting station is reported to have had a reprieve and avoided closure?

- A Radio Netherlands B Voice of Russia C Radio Canada International

COMPETITION

Mobile Control Box

By Fred Oliver G3LVJ

To make life easier when mobile using repeaters, the late Fred Oliver G3LVJ came up with a good idea. This project is a cheap and easy answer to the problems of timing out and how to keep the p.t.t. pressed while times.

During a spate of mobile operating one summer, it occurred to me that there must be a more convenient and less frustrating way of operating. Wouldn't it be nice, if I didn't have to hold in the microphone push to talk switch (p.t.t.) and had an idea of how long I'd talked!

There's also the safety side of having to hold the microphone in hand whilst driving. This could place me (or any driver) in a potentially dangerous situation, such as negotiating roundabouts, changing gear, etc.

The first idea that I had was a simple changeover switch to operate the p.t.t. This method would enable the transmitter and the microphone to be placed in a convenient position with respect to the driver.

Although the simple switch method is effective, it's possible to leave the switch in the 'on' position, or for it to be knocked 'on' by accident. So, I came to the conclusion that a timer set to the time taken for an average QSO would be the ideal solution.

As in many cases of a simple-to-use timer circuit, the extremely versatile '555 timer i.c. came to mind.

Using just a single '555 type timer as the controller would be adequate, but under practical mobile conditions the driver might not always be aware that transmission was about to cease, or even when it had ceased.

So, to give an indication that the timing period is about to end, I included the use of the second timer. In the end I decided to use a dual '555 chip, the '556 type, the reason why I decided to do that will become apparent later.

I also decided that using a double sided p.c.b. material is not really necessary. Even though it is very convenient to use with regard to 'earthing' and decoupling components around IC1.

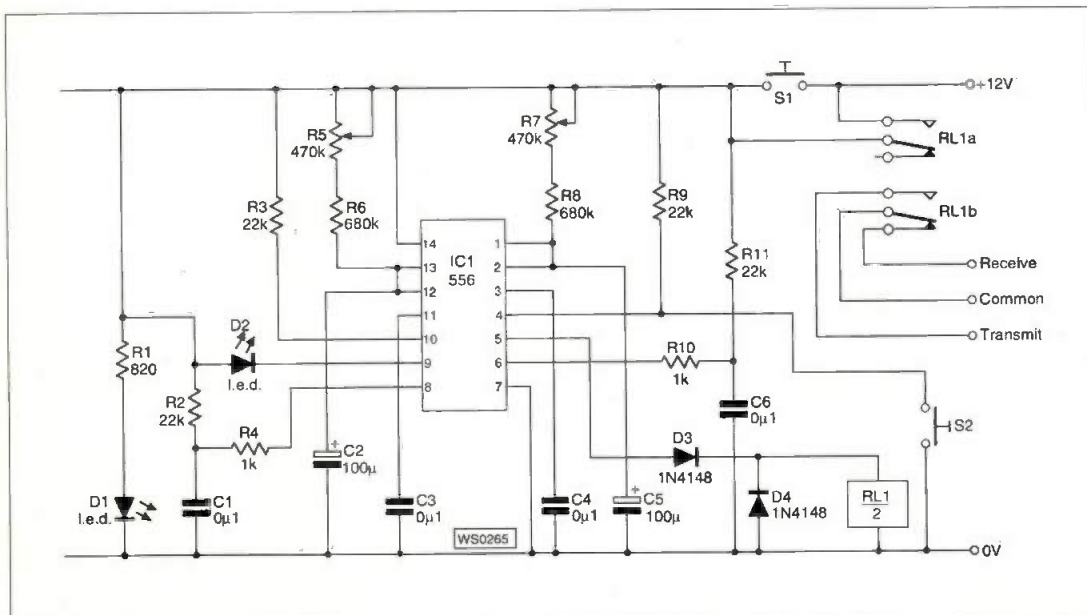
Convenient Place

The control box can be mounted in any convenient place close to the driver and held in position with any temporary fastening method. But before describing the circuit itself first, please have a look at Fig. 1.

In the circuit of Fig. 1 you can see that, as it's shown in the quiescent



Fig. 1: The circuit diagram of the control box. It is based on a dual '555 timer chip with similar times set.



state, until S1 is closed, no power is applied to the timer circuit as the relay is de-energised. On closing S1, power is applied to the circuit.

Capacitor C6 is initially discharged, a delayed 'start' pulse is applied to Pin 6 of IC1 via R10 and R11. Relay RL1 is now energised via Pin 5/D3 allowing power to bypass S1 and hold the circuit in operation via RL1/a contact.

Relay contact RL1/b contact closes at the same time so 'pressing' the p.t.t. and switching on the transmitter. The power on i.e.d. D1 also lights up indicating both timers are activated.

Immediately on S1 closure, both halves of the i.c. start timing cycles controlled by R5/6 and C2 (Timer 2) and R7/8 and C5 (Timer 1). Relay RL1 will latch itself via on contact (the other contact controls the p.t.t. line) until both the timers complete and the circuit de-energises.

Both timers have similar time periods and are variable via R5 or R7. The resistor R5 is adjusted to complete the timing cycle (of the left hand side) some 6-10 seconds before the completion of the main control timer.

Pin 9 of IC1 will be held high and throughout the period the left hand timer circuit is active. This high level on pin 9 during the period means that i.e.d. D2 remains off while the timer is active.

When the left hand timer period resets (some 6-10 seconds before the main timer resets) the voltage on pin 9 goes low. At this point, because power is still applied to the circuit, the i.e.d. is turned on.

Being a flashing type of

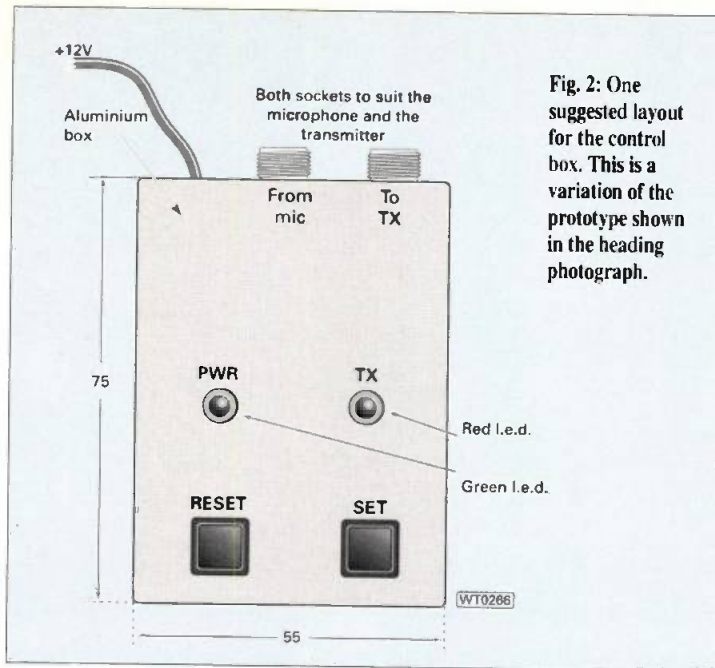


Fig. 2: One suggested layout for the control box. This is a variation of the prototype shown in the heading photograph.

I.e.d. D2 flashes on and off for the difference in the timer periods, giving an indication that the main timer is about to turn off. This period when the I.e.d. flashes would allow the operator to either reinitiate another transmit period, to continue the over, or just automatically go back to receive.

I should mention that transmission can be terminated at any time during the cycle. To terminate an 'over', and so switch back to receive at any time after starting, you should merely tap the S2 switch. Pressing this switch resets the timer, at which point RL1/a removes power from the circuit.

I'm not really going to describe the construction of the circuit as there are several ways it could be tackled and it's your choice. Although I produced a circuit board layout, you could, by following the layout of the circuit of Fig. 1, use the 'Ugly-bug' method

(the i.c. has the numbering shown as seen from underneath). You could also make the circuit up on matrix board, or Veroboard or something similar.

Setting-Up

All tracks or connections should be checked for short circuiting solder bridges, etc. Having built up the circuit as shown, we now come to setting-up the timers. All that's now necessary is to decide on the average amount of time for an 'over'.

The timers can be adjusted over periods of about 15 to 120 seconds. I found that approximately one and a half minutes was about right. I set the R5/R6/C2 timing circuit to about 10 seconds less. If the circuit is built as described, and seems to be working OK, R5 and R7 will be the only

adjustments required.

Incidentally I found a watch with a second hand to be very useful during calibration. I started the process by setting both R5 and R7 to their maximum values.

Leaving R5 at maximum, you should press S1 to start the timer circuit and energise RL1. When RL1 is latched I.e.d. D1 should light up.

Measure and note the length of time it takes for RL1 to unlatch and for D1 to extinguish. This should be approx two minutes.

Next set R7 to a slightly smaller value and again press S1. This should cause the relay to unlatch earlier. If the time is still too long, carry on in the same manner until the required time is reached.

To calibrate the 'time-out' warning I.e.d. D2, do exactly the same, but set R5 so that I.e.d. D2 starts flashing some 6-10 seconds before the circuit 'times out'. The flashing I.e.d. D2 will flash to signify that the circuit is about to drop out.

At any time during the whole period the timers can be terminated by pressing S2. And now that you have the circuit built and calibrated, you should connect the control box to the transceiver via multicore connector cable.

I've not described the microphone in any way, but for use with this circuit it will probably need to be 'live' all the time so that there's no need to press another switch on transmit. And of course this was the point of this project!

PW

Shopping List

Resistors

Fixed 5% (any type)

820Ω	1	R1
1kΩ	2	R4, 10
22kΩ	4	R2, 3, 9, 11
680kΩ	2	R6, 8

Miniature preset

470kΩ	2	R5, 7
-------	---	-------

Capacitors

Low voltage disc ceramic

0.1μF	4	C1, 3, 4, 6
-------	---	-------------

Electrolytic (16V working min)

100μF	2	C2, 5
-------	---	-------

Semiconductors

1N4148	2	D3, 4
556	1	IC1 (see text)
I.e.d.	1	D1 (green or yellow normal type)
I.e.d.	1	D2 (a red flashing type)

Miscellaneous

Two simple push-to-make switches, a small dual pole changeover relay with a 12V coil, two sockets to suit the transceiver and microphone, a piece of matrix board or Veroboard and a suitable box to house the project.

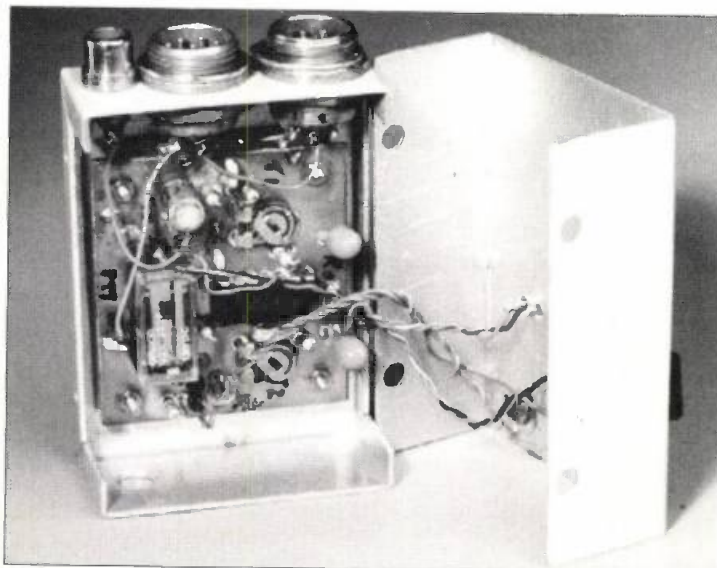


Fig. 3: The view inside Fred's prototype. There's no real need to use a p.c.b. to build this circuit, it just makes it look better.

Tribute To Fred Oliver G3LVJ

I'm sorry to say that since we accepted his article for publication, Fred Oliver G3LVJ has died. He was 63, and following service in the Royal Airforce, Fred worked in the electronics industry for many years. His widow Jean wished the article to appear, as it seemed to be a fitting tribute to her husband's lifelong interest in Amateur Radio. The PW Editorial team agreed and are pleased to publish the article, and we pass on our sympathies to Jean Oliver and daughters Wendy and Gillian.

Rob Mannion G3XFD



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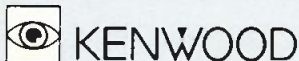
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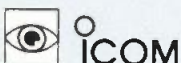
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The Good Old Days

By Jack Belcher

Jack Belcher, who formerly held the callsign G3FCS, describes his fascinating memories gathered over 50 years of activity in Amateur Radio.

My introduction to amateur radio came about unexpectedly one autumn afternoon in 1935. At the time I happened to be walking along the grass verge of the A40, not a million miles from Worsham Bottom in Mistletoe Bough county.

My thoughts were miles away, when I stumbled across a discarded copy of what I discovered to be *Practical & Amateur Wireless*. The illustration on the front cover proclaimed the main feature to be one of F. J. Camm's 'Silver Souvenir', complete - it said - with blueprint, which, surprisingly enough, it was!

Now, certain events in your memory can tend to stand out in surprising detail. This often signifies the beginning of something new or maybe a turning point in your fortune. So it was then, with the finding of that particular copy of *Practical & Amateur Wireless*!

The 'Silver Souvenir' was apparently Camm's attempt to mark the occasion of King George V's Silver Jubilee in the summer of 1935. Hence it's title.

If memory serves me correctly,

Valved Converter

Incorporated in the receiver was a one valved s.w. converter. This was built around a Jackson Brothers 160pF variable capacitor with extended control shaft and a set of Eddystone plug-in s.w. coils.

The article was so much Greek to me at the time, but I was intrigued by the blueprint, the theoretical and wiring diagrams and the remaining articles and illustrations. So much so, that I read it repeatedly, and in due course, bought the occasional further copy, which only served to fuel my imagination and interest.

To have suggested at one time that my professional career had its early beginnings in what was essentially a childish encounter with - of all things - one of 'Camm's Comics', would have called forth howls of scorn from certain of my colleagues!

Yet today, looking back over the past 50 years or so, it's with a degree of nostalgia that I tend to ponder upon the various events which followed on from that particular incident.

Lisle Street

Amateur radio in the 1930s was to some extent a way of life for those living near such as Lisle Street and the Edgware Road and other parts of London famed for radio junk shops. Even more so because they had access to 230V mains electricity supplies, a factor not to be considered lightly.

The experience of an 11-year-old in the wilds of west Oxfordshire, enjoying the convenience of candles and oil lamps, with not a 'flea market in sight', was to say the least, less than

advantageous.

So it happened that I was forced to exchange my treasured Hornby train set (the result of many a night's carol singing and the doing of odd jobs) for a receiver. My 'swop' was a

'Brownie' crystal set with slide tuned inductor together with a pair of Ericsson 2000Ω headphones.

My sorrow at losing an old friend was soon forgotten when I awoke to the delights of energy-free wireless reception! Shortly afterwards I bought a more modern crystal set with plug-in coils for half a crown (12.5 pence!) and the local publican at the 'Mason's Arms' in Burford gave me a Pye 232 Bakelite 0-V-1 battery set.

Listening Restricted

At the time, listening was restricted to the reception of the l.w. 1500m National Programme from Daventry, some 40 miles to the north. The m.w. Regional Programme from Brookmans Park, some 60 miles away to the east, being itself worse than useless. And thereby hangs a tale!

Pulling out my 2-pin '25-' coil, prior to inserting a '60' coil to hear 'What the Wild Waves were saying' I heard Daventry at normal signal strength! Ergo! Radio receivers do not require tuned circuits to work satisfactorily! It was my first scientific discovery!

Eventually, trips to London found me purchasing old traded-in radio sets from Curry's in Putney High Street. The best of which was an Osram 'Music Magnet' with its useful cabinet-cum-control panel assembly.

I particularly remember having a Marconi V24 triode. This looked like a cross between a Marconi 'Q' triode and a Mullard wire-wound resistor!

My first venture into battery-valve operation was a Ferranti AF5 transformer coupled 0-V-1 l.w./m.w. receiver using a Wearite 'Unigen' coil. All the woodwork was completed with my trusty fretsaw and the wiring connections being made to screw terminals.

Old Magazines

Following a school 'away' Rugby match at Banbury I came across a shop selling old magazines very cheaply and I managed to buy a copy or two of *Television & Shortwave World* and *Short Wave Magazine*. In that manner, my interest in s.w. reception was aroused.

Not that F. J. Camm was slow in coming forward! On one occasion indeed, he produced a constructional article for a 45MHz TV sound receiver, employing a 4V h.f. pentode as a regenerative detector using cathode feedback.

I also recall our neighbour purchasing a Cossor all-wave 4 valve mains superhet. This receiver had a triode-hexode frequency changer,

Practical Wireless, May 1996

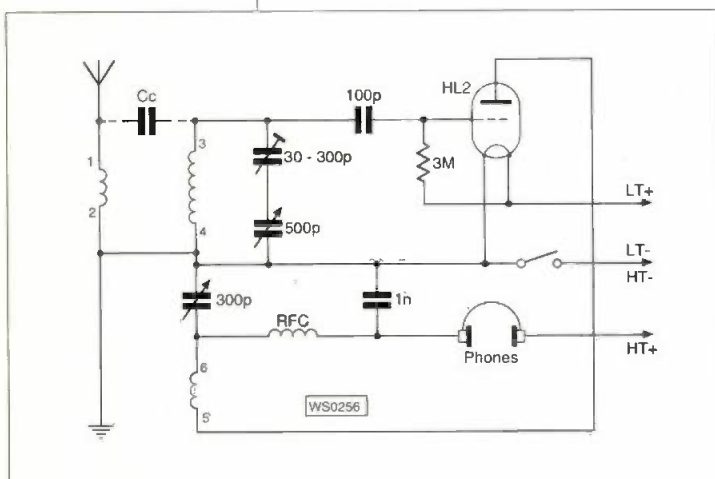


Fig. 1: Basic circuit of F. J. Camm's 'Simplest Shortwaver' published in *Practical & Amateur Wireless* during 1938 (see text)

the 'Silver Souvenir' was a straight t.r.f. mains operated l.w./m.w. receiver. It employed a Wearite 'Universal' switched coil assembly in the customary band-pass configuration.



followed by a regenerative i.f./second detector, which could be used for c.w. reception!

Looking back, I suppose I was fortunate that in many ways the electrical and mechanical design of radio equipment was at its peak in the late 1930s and early 1940s. Short wave equipment in particular was designed to engineering principles, rather than to the value-analysis mentality of accountants and the strange whims of commercial designers.

Outstanding Item

One outstanding item at that time was the Lissen Hi-Q s.w. four-band coil turret. Coil turrets were in favour in those days in high power h.f. radio transmitters, such as those constructed by Power Equipment Ltd., where it was necessary to QSY several times a day in order to follow optimum propagation conditions.

However, the use of coil turrets never caught on in receiving equipment until the postwar years in TV tuner design. Thus the Lissen Hi-Q turret was years before its time, and was never exploited to its full.

A good example of an illuminated slow-motion drive was the Eddystone version with its ratio of 120:1. But a neat arrangement was their bandspread unit. This consisted of a 160pF bandset capacitor - straightline capacitance - which incorporated a detent mechanism permitting it to be set in increments of 16pF.

The bandspread capacitor filled in the gaps with a 16pF variable with slow motion drive. In later years I copied the idea in a transistorised receiver using a 12-way switch locator as the detent mechanism. That said, perfection in h.f. receiver design was undoubtedly achieved in the case of the National HRO-M.

Essentially, the HRO was a single-signal superheterodyne - or s.s.b - receiver. Today's enthusiasts giving the HRO's dial a spin (not against the stop please!) - would perhaps be unimpressed with its performance.

Ruggedly Built

The HRO was ruggedly built, having a 1/4in aluminium panel and welded steel chassis and cabinet. Despite this, it was much lighter than either a CR100 or an AR88. It used 6-pin UX-based valves, 6C6 and 6D6, although in later versions, these were replaced by 6J7s and 6K7s.

The HRO's screened plug-in coil units ensured that the h.f. coils were triple-screened. They thus provide some 60dB isolation from today's

computer interface.

The coil units in particular permitted easy access. So much so that I can strip down my coil units to their bare essentials for the annual overhaul, untroubled by ageing eyesight and clumsy fingers!

The HRO tuning dial and mechanism is a unique precision engineering job in itself. It's capable of outlasting any of the string and pulley arrangements favoured by its competitors.

But best of all is the HRO's clean, uncluttered, under-chassis

Handbook then described as a 'typical three-bedroomed semi', using the third bedroom over the hallway as a radio shack, then it's likely that fond parents would buy you a HalliCrafter's Sky-Buddy or Sky-Champion. And it's unlikely your delicate fingers ever turned the pages of such as *Practical Wireless*.

The rest of us were forced to achieve miracles with what Scroggie of *Radio Laboratory Handbook* fame would describe as 'the greatest heap of junk ever to be seen outside the 'Caledonian Market'. And he was

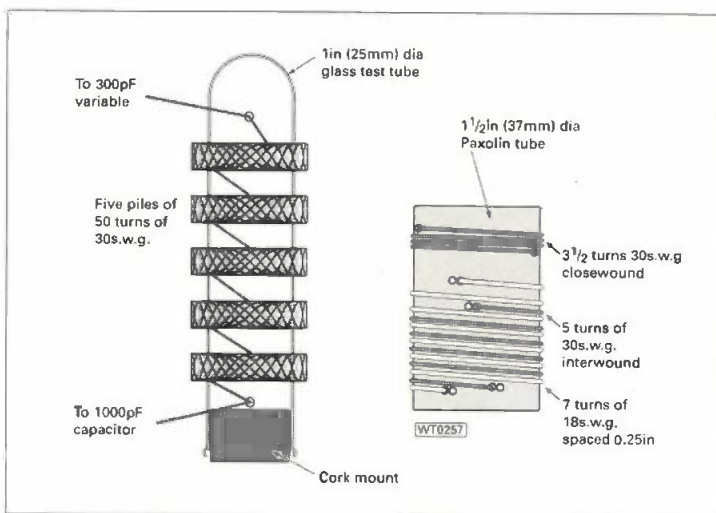


Fig.2: Tuning coil and radio frequency choke details from the 'Simplest Short Waver' (see text).

appearance, which to my mind, has never been equalled in a receiver of this complexity. It's this clean layout and excellent screening which probably contributes to its stability and low noise level.

Standard Receiver

During the war years, the HRO became the standard receiver for both military and commercial use, and was indeed employed alike by both Voluntary Interceptors and the Radio Security Services. It possibly fell out of favour with the introduction of multi-channel s.s.b. transmissions, as the AR88 had the wide and steeper i.f. response.

Despite the AR88, the HRO staged a 'comeback' some 20 years after its inception in the Television Detector vans of the 1950s. This was when it was used to receive the 30kHz second harmonic radiation from TV line-timebase oscillators.

Of course, the pertinent question at this point is, 'What has all that got to do with F. J. Camm and *Practical & Amateur Wireless*?' Be patient...and I'll explain!

Typical Semi?

In 1938, if you happened to live in what the *RSGB Amateur Radio*

talking about some extremely intricate research work that was being carried out under conditions typically enjoyed by the average radio enthusiast.

It was against the background described that F. J. Camm attempted to enable readers to achieve the impossible. This he did by taking the latest developments in professional radio engineering and adapting them for incorporation into less ambitious amateur radio projects.

So, it happened that in 1938, Camm came up with what he called the 'Simplest Short Waver'. It was seemingly his reply to the National HRO!

The diagram, Fig. 1, shows the main essentials of the 'Simplest Short Waver', as I remember them. I've also illustrated two of its most significant features.

Briefly looking back at the HRO, it's interesting to note that in order to achieve uniform gain throughout each of the h.f. bands, the receiver's r.f. coils were so designed as to be self-equalising. This was done by making the primary windings of high inductance so that they were self resonant outside the l.f. end of the band, thereby improving the gain at the l.f. end and by adding some capacitance coupling between the primary and secondary to improve the gain at the h.f. end.

"The rest of us were forced to achieve miracles..."

"My first attempt at using my newly-built short wave receiver was to hear G5JO - 'Five Juicy Oranges'."

Somewhat Unexpected

However, the design of the coil used in the 'Simplest Short Waver' is somewhat unexpected, as shown in Fig. 2. Indeed it goes against all the accepted principles of good h.f. transformer design!

The instructions called for a length of 1.5in diameter Paxolin tubing. But because the tubing didn't grow on any of the trees where I lived, I employed the discarded cardboard tube from a toilet roll as a substitute!

Predictably, my 'bog roll coil former' became a standing joke at school! And indeed I may have added an important contribution to technical terminology at the time!

The coil's grid winding of the coil consisted of 7 turns of No. 18s.w.g. tinned copper wire. Each turn was spaced 1/4in. The reaction winding consisted of 5 turns of No. 30s.w.g. (double silk covered) d.s.c., interwound at the earthy end of the grid coil as shown.

The antenna winding itself consisted of some 3-1/2 turns of No. 30s.w.g. (enamelled), closewound and located at the 'hot' end of the grid coil with about 1.4 inch separation. Which is to say, at the 'hot' end, rather than at the earthy end.

The close winding of the antenna coil will both increase its effective inductance and increase its self-capacitance. Thus it's likely to resonate at or below the l.f. end of the band. Then again, the close proximity of the 'hot' ends of the antenna and grid coils will introduce stray capacitance between the two.

So, in the manner described therefore, the tuning arrangement of the 'Simplest Short Waver' has a design feature similar to that of the HRO. (Under normal conditions, HRO coil units cover a 2:1 frequency ratio or thereabouts, e.g. 7.3-3.5MHz and the circuit capacitance will therefore change in the ratio of 1:4).

Bandspread Mode

A facility offered by the improved HRO-5, or in my case an HRO-M using HRO-5 coil-units is that a small adjustment enables the operator to use the receiver over the narrower amateur bands in the bandspread mode. The frequency range is typically 7.3-7.0MHz, a ratio of 1.043:1, calling for a capacitance ratio of 1:1.087 (considerably less).

When the bandspread mode is employed however, what happens is that padding capacitors are put in series with the main tuning capacitor. These effectively decrease its capacitance ratio to the required amount. Which is why

the preferred amateur band is always at the h.f. end of the coil range!

The difficulty for F. J. Camm at the time was attempting to overcome the problem of people like me using 500pF standard variable capacitors on s.w.

That's to say, capacitors normally giving a 1:9 capacity ratio and a frequency ratio of 3:1, e.g. 1500-500kHz to cover say 12-6MHz with a frequency ratio of 2:1, calling for a capacitance ratio of 1:4.

A maximum capacitance of some 200pF, in other words. This he achieved by using a 300pF preset padder in series with the main variable capacitor as shown in Fig. 1.

And so, 50 years later, it would appear that Camm's secret is a secret no longer. At least the old so-and-so made sure that readers were able to use 1930s techniques, even if they had to employ clapped-out components to do so!

The design of the r.f. choke itself was an unusual innovation as seen in Fig. 2. The basis was one 1in glass test tube mounted by way of a cork screwed to the baseboard. The main winding was nicely apportioned in five separate pie-windings in order to reduce overall stray capacitance. Simple, and very effective.

First Attempt

My first attempt at using my newly-built short wave receiver was to hear G5JO - 'Five Juicy Oranges'. He was using telephony on, I think, 40m.

At the time, both tuning and regeneration were extremely critical, owing to the presence of overmuch hand capacity and headphone capacity. Frustratingly, at the critical moment, the control panel, a piece of carefully selected and seasoned margarine box split down the middle. It left me with the tuning capacitor in one hand vainly attempting to disconnect the h.t. with the other!

The subsequent enforced rebuild in the 'Osram Music Maker' cabinet was a big improvement. A JB Polar variable capacitor was stripped of 60% of its vanes giving me a straightforward 160pF variable.

A few 1000pF decouplers were added to overcome the instability and the a.f. level increased by the addition of two stages of amplification. Short wave listening could now commence in earnest!

High Priority

Naturally, East Coast American stations were high priority on my list! Thus the pulp magazines came to life with commentaries of American Football, 'courtesy of the makers of Gillette Razor Blades'.

But the 'charts' at that time put me off 'pop music' scenes once and for all! This was because, having heard the 'Top 20' direct from America, it became obvious that a lot of fiddling was going on this side of the Atlantic.

The 'fiddling' was the first signs of song-plugging! But despite that, a pleasant experience of note was to hear G0CQ, Havana, Cuba, broadcasting a popular tune at the time accompanied by severe fading. It went something like this '...e're having a Heat Wave...(hiss)...a tropical Heat Wave...(hiss)'. All reminiscent of the surf breaking on a sultry Caribbean shore!

The acquisition of a Ford spark coil, together with visions of spark transmission, was not one of my best ideas. I would have been grateful to hear signs of 'arcing sparks' or even 'sparking arcs' - there is a difference - but to no avail.

Indeed a buzzer wavemeter would have given better results! Instead, I used the buzzer in a code practice set in an attempt to learn Morse code. Ultimately, I managed to learn the alphabet and claiming a speed of 5w.p.m. at so-called sending, of course!

Autumn Of 1939

Then came the eventful autumn of 1939. And despite my school prizes of books devoted to Anglo-Saxon and Norman architecture, I began to have second thoughts concerning my seeming future engaged in water-colour painting and the restoration of crumbling churches and cathedrals.

It was a career which everyone by myself seemed to take for granted. I, somewhat perversely, came to the conclusion that dear old Adolph (Hitler!) could crumble more churches faster that I could help to restore them. It was a situation not conducive to job satisfaction!

Unexpectedly, someone to whom I shall be everlastingly grateful, suggested that, in view of my interest in radio, it would be logical for me to apply an apprenticeship 'up at the Poles'.

The 'Poles' in this case were the antenna masts and triatics at the Post Office Radio Station, Leafield. So, sometime before Christmas 1939, I chewed my pen and finally sent off my letter of application. And promptly forgot all about it!

So it was in that manner that one of Camm's Comics, *Practical & Amateur Wireless* led me away from the dilettante life of architecture to the pragmatic world of the professional radio engineer. And the ultimate outcome? Ah! There hangs yet another tale!

PW

Low Cost Bi-directional Wattmeter



By Ken Fisher G0LKK

Ken Fisher G0LKK describes an interesting low cost bi-directional Wattmeter ideal for Novice or QRP operators

The Wattmeter I'm describing is really an economy version of the well known Stockton power meter. And of course the design credit, of the circuit shown in Fig. 1, is all to **David Stockton G4ZNO**.

In my version the costs are substantially reduced by using two 2-ounce tobacco tins. These are used to achieve the separate r.f. and meter compartments.

Back-To-Back

To start building (once you've found a generous smoker willing to donate their hard-won tobacco tins!) you should solder them back-to-back. A little solder at each corner is adequate.

If you don't have access to tobacco tins, small tin-plated boxes will be suitable. (Maplin offer tin-plated screening boxes in their catalogues).

Next, drill through the dividing wall between the two tins and fit the feed through. Then mount the connector sockets of your choice on the rear lid together with the stand-offs.

Two Transformers

Make the two transformers as shown, Fig. 2. These should be wound using short lengths of coaxial cable and 12 turn windings of thin insulated wire on the

can be glued onto the meters. Next, I suggest you should stick a piece of white label on the meter face and calibrate it against another meter using a dummy load.

First set the full scale reading that you require by means of the presets. Then carry on with the intermediate points that are required.

The circuit shown in Fig. 4, shows how to calculate the true power present in the load. As shown it's suitable for approximately 5W for 1 minute, for higher power use larger wattage resistors.

When you've finished, reverse the input and output plugs and repeat on the other meter. An alternative method of calibration is by the use of the formula

$$P = \frac{V^2 (d.c.)}{2 \times R} = \frac{V^2}{100} \text{ with a } 50\Omega \text{ load}$$

and the test set up as shown in Fig. 4 (over the page).

Continued on page 40

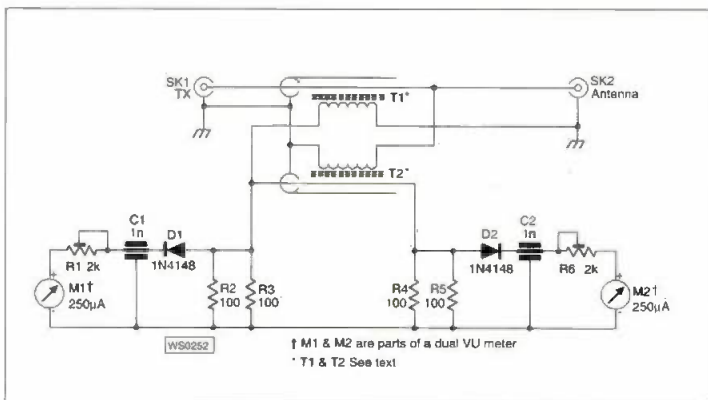


Fig. 1: Circuit of the low cost Wattmeter.

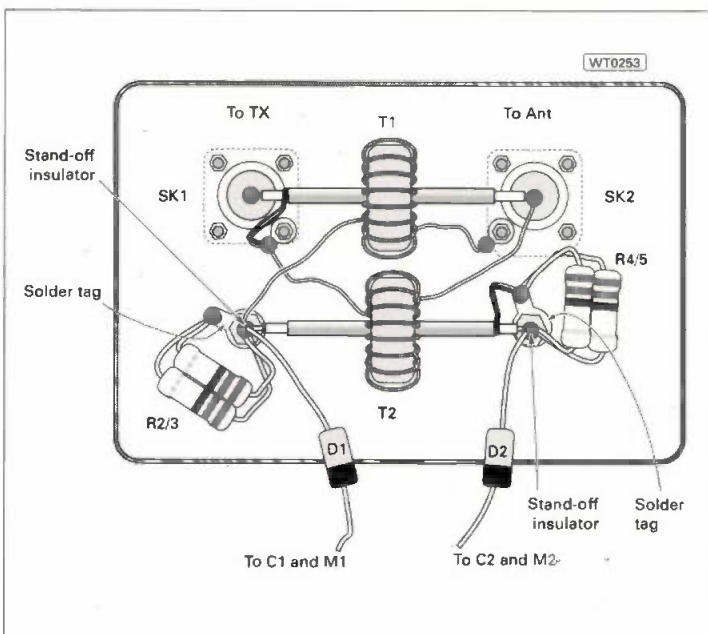


Fig. 2: Diagram showing constructional lay-out. In his prototype G0LKK soldered metal tobacco tins 'back to back' and mounted the meters on lid and the sockets on the rear lid (see text).

For the metering, I have used the dual VU meters which are frequently found at rallies and junk sales or are available from Maplin. And the FT-50-43 toroid cores used in my version are considerably cheaper than the original S1 cores.

FT-50-43 cores.

Connect the two pairs of 100Ω resistors and the two diodes, (all ground connections can be soldered direct to the tin lid). The interconnections to the dual meters are shown in Fig. 3.

The 2kΩ preset variable resistors

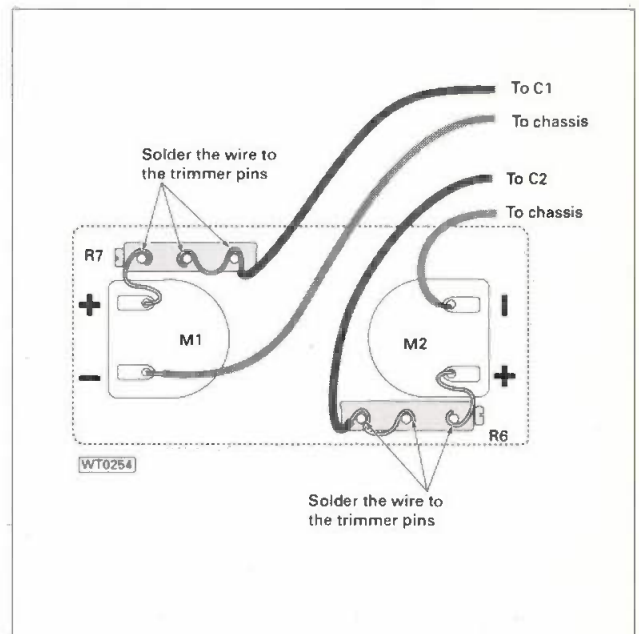


Fig. 3: Interconnection details for the dual meters used in the project (see text).

London Show Report

Rob Mannion G3XFD rounds-up the events that went to make up the 1996 London Amateur Radio & Computer Show.

The London Amateur Radio & Computer Show was held over the weekend of March 9 and 10. Better known as the 'Picketts Lock' show, promoted jointly by Radiosport Ltd. and the Radio Society of Great Britain goes from strength to strength. This year for the first time the show included the newly introduced 'vintage' section covering everything from 'Juke Boxes' to valved radio receivers, telephones and books.

Traders in the 'vintage' section reported good business and it looks as if the aspect of the show is likely to quickly expand. I must admit that whenever I could spare the time, I was browsing in the vintage section...it was fascinating. And the rumours that G3XFD bought something are true. I bought a Vidor 'all-dry' 90V and 1.5V battery-powered valved portable receiver for £5!

There were many products to see in the main show, but one which interested me greatly was the prototype AKD general coverage receiver on show at the Stand (Stand T) in the Red Hall. Due to be launched in September, AKD's receiver, planned to be sold for around £160, is yet another example of the innovative engineering available from Britain's 'home grown' Amateur Radio manufacturers.

Both Saturday and Sunday were very busy, and unusually, the Sunday stayed busy until well in the afternoon where it

normally 'tails off'. However, as it was a mild and clear day outside, the ventilation (particularly in the Red Hall where the PW stand was located) seemed unable to cope with so many people and the increased level of tobacco smoke in a 'no smoking' set of halls. As a result the hall became quite stifling and many visitors and traders (including me!) were uncomfortable in the hazy and stuffy atmosphere.

The organisers have greatly improved the toilet facilities for people attending the show. But now they have to look at improving the inadequate ventilation, especially as the show is set to become even more popular. It's either that or they should rigidly enforce the (already existing!) no-smoking regulations at the Picketts Lock Centre.

I enjoy the Picketts Lock Show, it's a great weekend, and it would be a pity to see the crowds grow even larger, only to disappear in a fug! So, here's to Picketts Lock 1997, improved ventilation and an even better show.

PW

Charles Miller and his wife Jo on duty at The Radiophile stand, looking pleased at the interest shown by visitors to the newly introduced vintage section at Picketts Lock on March 9 and 10.



Ten years in making masts for radio amateurs and they're still smiling! Perhaps Norry GM4VHZ and Rose GM4NHH ('Norry's HomeHelp) Brown of Tennamast' are tempting G3XFD into up-dating his own Adapt-A-Mast or to return to Scotland again?



"A great deal of interest is being shown in our new receiver" reports Val Wagstaffe of AKD. Pictured (l-r) Val Wagstaffe, John Armstrong G8MVH, Roger Wagstaffe behind their new receiver. Aiming at a September introduction date, the 500kHz to 30MHz receiver was on show to demonstrate its attractive styling, large clear front panel display, frequency read-out and general lay-out. A budget priced product is the aim of the Stevenage-based company. "We're aiming at around £160 for the receiver, in line with our popular v.h.f. transceivers" Roger Wagstaffe told PW. "And a companion transmitter could be a future project".



Probably the only item of 'equipment' not for sale on the extremely busy Martin Lynch stand in the Red Hall on 9 and 10 March was young 'MicroHenry' Lynch himself. Mum Jenny has kitted Henry out with his own distinctive 'Lynch Mob' T-shirt, but denies that MicroHenry has taken over from his father (yet!).



Sandpiper Communications are never really 'up the pole' when it comes to supplying antenna technology. With modern plastic-moulding facilities, together with their expertise, this south Wales based company can provide literally anything you need to build or design your antenna.

Continued from page 39

Low Cost Bi-directional Wattmeter

This should provide (In round figures)

1W = 10V	4W = 20V
2W = 14V	5W = 22V
3W = 17V	

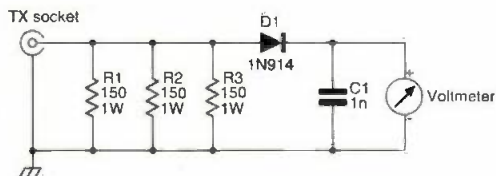


Fig. 4: Circuit used for alternative calibration (see text).

Final Assembly

Before you tackle the final assembly, a couple of coats of aerosol spray paint and a thin card mask around the meter gives a nice appearance. The meter can be fixed in place with glue or epoxy resin adhesive (Araldite or similar). That's it...you've now got yourself a low-cost Wattmeter. And apart from your smoker's cough (or that of the tin supplier's!) it won't have cost you much!

PW

Shopping List

Resistors

Carbon film 5% 0.5W
100Ω 4 R2, 3, 4, 5

Multi-turn preset

2kΩ 2 R1, 6

Capacitors

Feedthrough type preferable
1nF 2 C1, 2

Semiconductors

1N4148 2 D1, 2

Miscellaneous

You will also need two ferrite toroids type FT-50-43, two 50g tobacco tins (or tinplate boxes of a suitable size), two coaxial socket to suit your system, two stand-off insulators and four solder tags, two short length of a thin 50Ω coaxial cable and about 400mm of thin insulated multi-strand wire. One dual (or two VU meters) of about 200-250μ A f.s.d. and of course nuts and bolts to suit everything.

My Kind Of Holiday



The Island Of Mykonos

By Phil Whitchurch G3SWH

*Phil Whitchurch
G3SWH describes his
holiday expedition to
the relatively unknown
island of Mykonos.*

MYKONOS is one of the Cyclades Islands located in the Aegean Sea at approx. lat 37.50N long 25.20E, and thus counts for IOTA purposes as EU-067. It is one of the most picturesque places on the planet and has been the setting for many films, including most recently 'Shirley Valentine'.

My wife Jan and I have been taking holidays on the island since 1980, when our children were very small, and this year we made our 14th visit. The children no longer come with us, being almost 19 and 21, though they would dearly love to if Mum and Dad would pay!

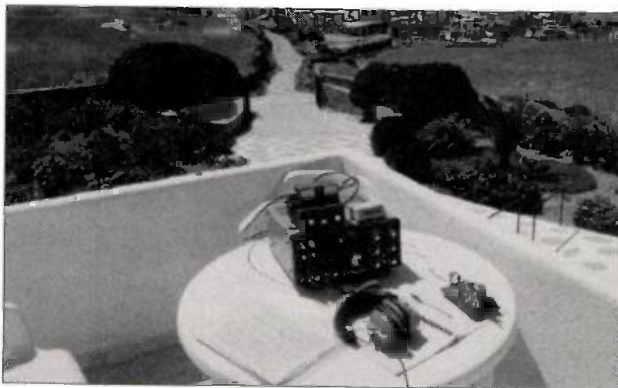
The island is relatively unknown, as none of the major and very few of the smaller package tour operators go there. There is a very free and easy, extremely cosmopolitan atmosphere. One thing that I particularly like is that the proportion of Brits is quite small. However, there are plenty of English speakers from Australia, New Zealand, Canada, South Africa and, of course, the USA, as well as visitors from the rest of Europe. It is not unusual for an impromptu party to collect at the beach bar comprising about eight or more different nationalities.

First Visit

When we first started to visit, the only way was to get a night charter flight from Gatwick or Luton airport to Athens, and then take an early



The radio was best sited on the table on the west facing balcony outside of the apartment.



morning ferry from Piraeus, which took about seven hours and called at Syros and Tinos islands en route. The outgoing journey took a total of something like 16 hours and the return journey took about 22 hours, so you really had to want to go!

In later years, it was possible to take a short Olympic Airways 'domestic' flight from Athens to the island. But these flights were prone to cancellation at short notice due to bad weather, which gave potential problems in catching the Athens/London flight home.

It has only been relatively recently to get a direct flight from Gatwick to Mykonos, using Boeing 737 aircraft. The runway is quite short, and the aircraft has to get onto the ground in about the first five yards, or go round again!

It's a tribute to the pilot's skill that I have never seen them go round again. I believe that professional pilot Keith G3VKW has made the flight on several occasions, but I don't think I've ever been a passenger on one of them. Keith tells me that it is in his terms a 'tricky' airfield when the wind blows in a certain direction down the valley close to the runway threshold as this can cause 'marked turbulence shortly before landing'.

As a consequence of the short runway, it is not possible for the 737 to carry sufficient fuel on the outward flight to return to London without refuelling. This means about an hour's stop-over in Athens on the return journey to top up the tanks.

Capital Athens

The capital Athens has got to be one of my most (un)favourite cities. I think that Miles Kington was absolutely right when he wrote 'Most Greeks are the most helpful and friendly people in the world. The rest have gone to Athens to take up taxi driving'.

It had often crossed my mind that it would be interesting to take some amateur radio equipment to Mykonos. Greek Island expeditions by other amateurs always seem to attract lots of interest, although they are more often from either Crete (SV9) or the Dodecanese Islands (SV5), which enjoy separate country status from mainland Greece.

The island group is not that rare from the IOTA point of view. I have even seen reported a couple of earlier operations from the island, including one last year by Taizo GWORTA, but these have only been on s.s.b.

I have only ever made one c.w. QSO with EU-067 myself, which was in August 1983, and I never did get a QSL card for that. So, I felt that this year a c.w. only effort would be interesting, and maybe give a few of the Deserving a new IOTA or even a DXCC band slot.

Proceeded With Preparations

When I mentioned my embryonic plans to Jan, they were greeted with less than enthusiasm. But it was a

My Kind Of Holiday

ISLAND OF MYKONOS, GREECE

SV8/G3SWH

IOTA: EU-067

LOC: KM27QU

Lat: 37°50'N Long: 25°20'E

My special thanks to my wife Jan, and to Paris and Maya Panayoyopoulos of the Geranium Apartments, without whose tolerance and encouragement this operation would not have been possible.

73 and thanks for the contact



Phil Whitchurch, G3SWH

ABOVE: VILLAGE HOTEL (EMERUS) Telephone 01183 819710 Fax 01183 81994

Special QSL cards were printed for G3SWH's holiday expedition.

long way short of downright rejection, merely something along the lines of 'You must be mad!' So, I proceeded with my preparations in the certain knowledge that I wasn't going to provoke a showdown over the issue and spoil our holiday.

As it turned out, I made Jan a promise that whatever time I spent playing radio would not affect our time together. I kept that promise and we both had one of the best holidays on Mykonos that we can remember.

I tried to arrange to borrow the new rig which Yaesu had donated to the IOTA programme, but it was in use the week before and the dates which I wanted it for clashed. Then I tried to borrow several other lightweight rigs, but there always seemed to be problems in that they didn't have mains power supplies and/or c.w. filters, so I made the decision to take my ancient Yaesu FT-101ZD, which weighs in at about 19kg.

I made up some lightweight wire dipole antennas for 7, 10, 14 and 18MHz, fed from a common coaxial feeder, packed the a.t.u., s.w.r. bridge, Vibroplex and headphones in the hold baggage. Then I took advice from Roger G3SXW and from Phil G4OBK about the best way of

transporting a heavy h.f. radio on a charter flight.

Roger and Phil both told me to carry the rig as hand baggage and to try to pretend that it wasn't heavy! This proved a lot easier than it sounds, as the check-in desk staff at both Gatwick and Mykonos airports just weren't interested in hand luggage.

I was also expecting the X-ray machine to light up and say 'tilt' when the radio went through it, but again the Security staff at both ends weren't interested, even though I wheeled a baggage trolley loaded with the rig through the magnetic loop at Gatwick.

Apartment Booked

Our apartment which we had booked for this year was new to us, and was a bit up market from what we were used to. We had discovered it last

I would like to record my particular thanks to my wife Jan for her tolerance and understanding in what could have easily been a disaster. My thanks also to Paris and Maya Panayoyopoulos, the owners of the Geranium Apartments in Mykonos, for their help in making this holiday operation a success.

year whilst exploring the island.

The apartment turned out to be a superb radio QTH, as it was some 180+ metres above sea level on one of the highest points of the island with a clear take-off over water to the south, east and west. The take-off to the north was less satisfactory, but the land was flat.

Our actual room was on the first (top) floor and I quickly established that the radio would be best sited on the table on the west facing balcony outside. And although this meant that I would have to set-up and dismantle the radio at the start and end of each operating session, this actually took less than five minutes to achieve.

After carefully asking for permission from the Greek owners, I found a convenient method of rigging the centre of the dipoles. This I did at about six metres above the ground and spread out the legs of the dipoles to form inverted vee type antennas with as open an angle as I could achieve. I think that I was on the air within about five hours of arriving on the island, and that included general

unpacking and visiting the beach!

A very tentative CQ at 1542UTC on May 23 on about 14.025MHz worked! It brought an immediate call from SM3AJW, followed straight away by G3RVM and then by my old partner in crime from our 1991 joint visit to Uzbekistan, G3LZK.

I settled down with a large Vodka and tonic and spent a very pleasant hour and a half or so running a modest, mainly European, pile-up on 14 and 10MHz. Then it was time to get ready and go out for dinner and enjoy the rest of the evening.

On The Air

It was always my intention to get on the air for the odd half hour or more as and when I could. Then the very satisfactory pattern emerged of an operating session in the late afternoon, whilst watching one of the spectacular Mykonos sunsets from the balcony.

I also worked an 'early morning' session (0700 to 0900UTC) whilst waiting for Jan to catch up on her sleep after what were usually very late nights sampling the nightlife of the town. (For some unknown reason, I

was never 'hung over', despite revelling equally, if not more so!).

Band conditions were particularly bad and I noted when I got back that the Solar Flare Index reported on the Cluster for the week never got above 70, being around 67 for most of the time. For this reason, most activity was on 10MHz, which tends to be my favourite band anyway.

Surprisingly, 14MHz produced very little activity, and it was not unknown to call CQ for five minutes without getting a reply. Even during the CQ WW WPX contest, I only managed 3 QSOs, and must have been the only station in the contest with an SV8 prefix!

I operated on this basis for a total of just over 12 hours during the course of the week, and made 741 QSOs, mostly with Europeans, but with a respectable number of JAs and only 2 Ws, mainly due to the poor band conditions and the times of day when I was able to be active. It made a good holiday even better!

PW

The band breakdown for the week is as follows:

7MHz	73 QSOs	25 DXCC countries
10MHz	432 QSOs	41 DXCC countries
14MHz	124 QSOs	28 DXCC countries
18MHz	112 QSOs	29 DXCC countries
Total:	741 QSOs	52 DXCC countries.

Amateur Radio in the Maldives

practical
FEATURE

By Nick Plumb G0PBV

Can you believe, a honeymoon stay in the Maldives which coincidentally included the IOTA Contest? Nick Plumb G0PBV describes a memorable fortnight in an idyllic setting.

It is not often that the opportunity arises to operate an amateur radio station in one of the most idyllic locations of the world. And I have to admit that it would not have been possible without a very understanding wife, who let me slope off to operate at irregular hours during our honeymoon stay in the Maldives!

The Maldives are a chain of 1192 small, low-lying coral islands grouped in atolls about 600km south west of Sri Lanka. The exact location of operation was the small island of Hembadoo, 35km north west of the Capital Male', locator MJ64QK and IOTA AS 013.

transfer was a bent tuning knob shaft on the TR-9000 and a slightly dented p.s.u. housing.

The dipole went up on July 28 (unfortunately, the centre of it was only about 3m a.g.l. due to the constraint of a limited length of coaxial cable), but the first station heard at 1046UTC on 14MHz was **XX9AS** ('59') in QSO with a JA, so I gave him a call, but without success. Calling CQ further down the band was not productive either!

Calling CQ

The following day at 0822UTC I heard **VK8LC** ('55') in QSO with **VK4YI** and gave him a call.....no reply! It became evident that either the power, the antenna or the time of day was inappropriate, I hoped it would be the latter!

The same day at 1732UTC I called **VU2SMN** ('5 9+10') with fingers crossed and got a reply from Suhas in Goa. Shortly after that, a QSO with **JG3TRB** (also '5 9+10') and Jum, in Kobe, who gave me a '56' with his TS-950 and 3-element yagi.

At 1817UTC **Lars SM3CCM**, gave me '55' from Ullanger. Now, I thought, we're in business and ready for the IOTA Contest!

Anticipating a pile-up on IOTA day (you always dream of being on the other end!), I enthusiastically switched on at 1536UTC on July 30. The ether was full of DX (mainly on 14MHz): **B00M**, **YB30SE**, **VU2OAR**, **RW9UP**, **ZS6ALK**, **VS6SL**, **V85PB**, **G00YQ(!)**, **JA8GYQ** (21MHz), **ZS6CBA** (21MHz), **RK3DXW**, **UT1DI** and **JR5JAQ**, but could I make a QSO?

The only QSO during the period was **Larry VQ9LW** on Diego Garcia Island who gave me '57'. I can only presume that there was so much QRM that my poky little 30W dipole just couldn't get through!

Contest Finished

Once the contest finished, I'd had QSOs with **VU3NWZ** in Patna, **VR2BH** in Hong Kong and **ZS6CEZ** in Rustenburg! The following day at 1127UTC I started with a 'local' QSO, **Sriram VU2SK** in New Delhi and then received a '56' from **Garry NH2G** in Guam before a brief report of '55' from **VS6WV** who was in the middle of a tropical thunderstorm!

Not long after, **George HS0ZAZ** in Pattaya game me a '55' on his FT-757 and vertical, but there was no significant QSB. The best time for the 14MHz band (little was heard on 28 or 21MHz) seemed to be after 1230-1300UTC, but unfortunately, the only time I heard a UK station was during the IOTA contest. The ensuing days yielded several more QSOs with VU2 stations.

Last QSOs

The last three QSOs of the trip were also memorable, **Marian 5R8DY** on Madagascar who gave me a '54' and **Jon A61AF** in the centre of Dubai ('59'), who offered to show me and Sue round if we were delayed in Dubai on the return trip!

On the day we departed, **Bob VQ9HE** on Diego Garcia (British Indian Ocean Territory!) who was able to give me '55' before he disappeared into the noise. At 0636UTC on August 9, the station was closed down and packed away for the return journey. Perhaps one day we'll go back!

PW



Nick Plumb G0PBV operating with the callsign 8Q7AE.

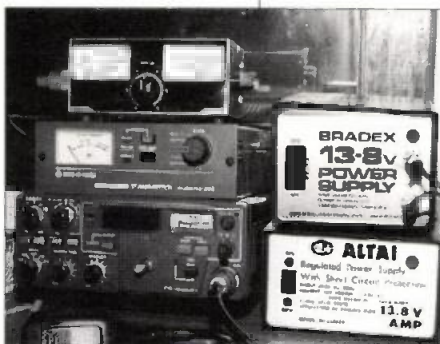
Licence & Equipment

The application for a licence was submitted to the Telecommunications Department in Male' in February.

Eventually, by June 23, a reassuring envelope dropped through the letterbox with confirmation of the licence and callsign 8Q7AE.

The decision about equipment rested on what was immediately available and its total weight. I chose my Trio TR-9000 144MHz TX/RX, Tokyo HX-240 transverter (30W output), two small 13.8V p.s.u.s (7kg all up) and the hardware to construct a fan-shaped multi-band dipole for 28, 21 and 14MHz.

Jet lag took its toll for the first day, but we did have a listen to the BBC World Service on 15.310MHz using a small vertical length of wire for the antenna. The signal came in '57' (with pre-amp) and the only apparent damage to the equipment incurred on the boat



The equipment taken, which included a Trio TR-9000 144MHz TX/RX, Tokyo HX-240 transverter (30W output), two small 13.8V p.s.u.s (7kg all up) and the hardware to construct a fan-shaped multi-band dipole for 28, 21 and 14MHz.

Practical Wireless, May 1996



John Heys G3BDQ takes over the 'workshop' this month to describe a general v.h.f. discone for 144-430MHz operations, before looking at the T-Lambda antenna, a skeleton discone.

Antenn

The discone antenna is now well known and widely used. It is especially to be found in use on the v.h.f. bands because of its very wide bandwidth. The wide bandwidth allows reception and transmission over several octaves of frequency. A discone antenna designed for 50MHz will also work well on 144MHz and even up to 200MHz.

The original discone design was developed in 1945 by Armig G. Kandoian and the antenna may be thought of an upside-down conical monopole. The current maximum is to be found at the top of the antenna instead of at the bottom, as is more usual with conventional quarter-wave monopoles.

Fat Unipole

A discone antenna is an inverted ground plane using a 'fat' unipole quarter-wave radiator. It is the length to thickness ratio which makes the discone a very broadband radiator. The example shown in Fig. 1 when designed for a basic frequency of 140MHz will allow operation right up to 450MHz with an s.w.r. value of no worse than 2:1 over this range.

The design centres around a square flanged SO239 socket. If an 80mm diameter copper or brass disc is bolted to the socket body, small insulated spacers can be used to keep the main disc rigid.

Instead of solid metal discs and cones, wire elements may be used so long as the mesh holes

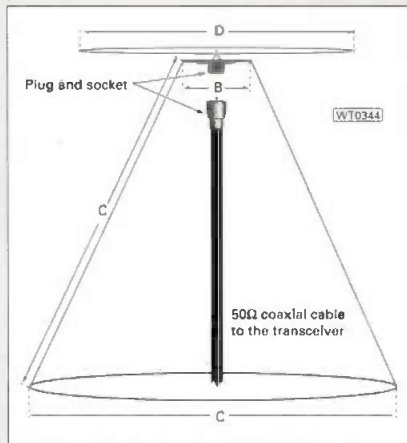


Fig. 1: The 'normal' discone type of antenna.

Dimensions for a version to work on 144 and 430MHz are given in the text.

have no dimension greater than 0.02 of a wavelength. At 144MHz this is about 40mm. In fact many commercial discone antennas have only six or eight radial elements for both 'disc' and 'cone'.

When embarking upon the construction of a discone, it is best to first make the outer wire rings for the disc and the cone. One or two small rings positioned down the cone will keep it in shape. Several stiff wires made from 1.5 or 2mm diameter will suffice if the rest of the cone is made with much thinner wire.

The discone antenna shown in Fig. 1 has the dimensions (in millimetres): D = 350, C = 590 and B = 80. The antenna will then be suitable for transmitting or receiving on the 144 and 430MHz bands.

Discones for other frequencies may be designed by using D = 66% of the free space quarter-wavelength at the lowest wanted frequency and C being 110% of the quarter-wavelength. A wire discone made in this way performed beautifully when hung up in my roof space.

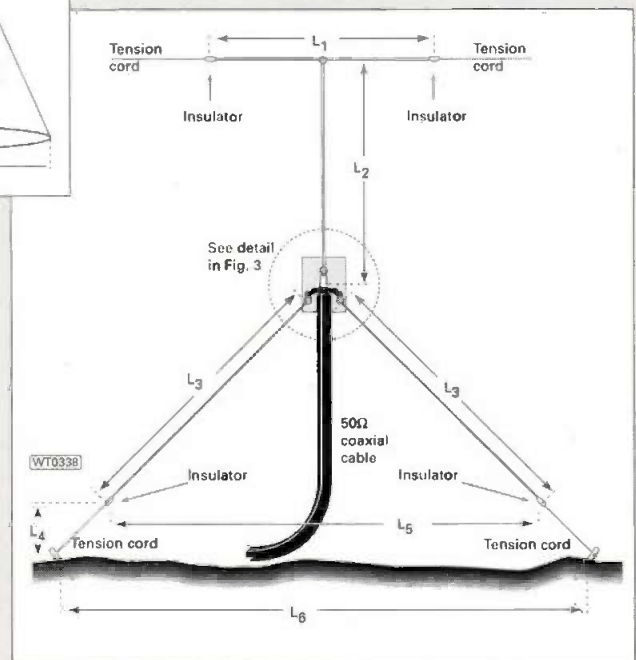


Fig. 2: The complete 'T-Lambda' Antenna.

Stripped Down

We are indebted to Robert Wilson AL7KK for the development of the stripped down or skeleton discone antenna (he has been involved with the forward planning of short wave broadcast stations).

Robert Wilson's antenna

design can be dimensioned for either h.f. or v.h.f. use, and provides a fine all round low angle radiation pattern. It also allows easy matching and has a radiation field that is not disturbed by the feeder.

The 'T-Lambda' design is shown in Fig. 2. Instead of

Table 1

Band (MHz)	L1 (m)	L2 (m)	L3 (m)	L4 (m)	L5 (m)	L6 (m)
3.70	14.37	10.75	18.0	5.75	25.45	37.00
7.05	7.54	5.64	9.44	3.02	13.36	19.40
10.10	5.26	3.94	6.59	2.10	9.32	13.54
14.20	3.74	2.80	4.69	1.50	6.63	9.63
18.10	2.93	2.19	3.67	1.17	5.20	7.55
21.20	2.50	1.87	3.14	1.00	4.44	6.45
24.90	2.13	1.59	2.67	0.85	3.78	5.49
28.50	1.86	1.39	2.33	0.75	3.30	4.80

a Workshop

a complex cone of conductors, to be found in most discone designs, only two conductors (both shown as L3) are used in the 'T-Lambda' design. The top of the 'T' section (L1) does not radiate, for the r.f. currents in each half are opposite in phase and so cancel each other out. The vertical section L2 is longer than usual in discone design but this is needed to match the antenna to 50Ω feed (coaxial cable).

To ensure a feed impedance of 50Ω there must also be a minimum distance between the lower ends of the wires L3 and ground. In Fig. 2, this minimum distance is marked L4. This height above ground is not great and will be three metres on 7MHz and reduces to 0.75m for an antenna designed for a 28.5MHz version.

The 'T-Lambda' design displays a considerable bandwidth and can be used (via an a.t.u.) on adjacent bands up or down in frequency. One of my local stations made a 'T-Lambda' for the 28MHz band and found that it gave excellent results on 24MHz.

Thin Aluminium

The antenna may be constructed from thin aluminium tubing when designed for 28MHz or above. But for general h.f. use a wire construction is both easier and cheaper. You will find I've worked out the various lengths, Table 1, for the h.f. bands. Use Table 2 to create versions for the other bands. The horizontal 'T' section can be supported between

masts, trees or any available supports. The total height needed will lie between 30m for the 3.5MHz band and just 3.8m for the 28MHz version.

Antennas made for the bands between 10 and 28MHz will require end support heights of 11m or less. This should present few problems for most amateurs.

The antenna will fit into quite small gardens, the

Nylon monofilament or similar could be used at the wire ends if insulators are not available.

For best effect the coaxial cable must drop down vertically to the ground. And it's preferable to use a current balun at ground level. This balun may be just five or six turns of the coaxial cable with a coil diameter of 150mm or so. The coaxial cable can then run back along the ground or, better still, it

of water to the coaxial cable. If the antenna is to remain indoors then this doesn't matter so much. I have a 'T-Lambda' antenna, made for the 144MHz band using 2.5mm copper wire, hanging in my loft.

The wire 'T-Lambda' antenna for 144MHz has proved to be much better than any monopole that I've used previously. Properly dimensioned and positioned, a 'T-Lambda' will have an s.w.r. of 1.3:1 or better at its designed frequency.

Poor Conditions

Unfortunately, DX conditions on the higher h.f. bands are poor at present, but a 'T-Lambda' on the 28MHz band has provided excellent ground wave working in the f.m. section of that band.

Using the 'T-Lambda' antenna, I've had many contacts with European stations during the summertime Sporadic 'E' openings. During one of the rare winter openings across the Atlantic some North American stations were contacted.

Should you be the fortunate possessor of a couple of 60m high masts and some real estate at least 74m long, what about the 'T-Lambda' for Top Band?

PW

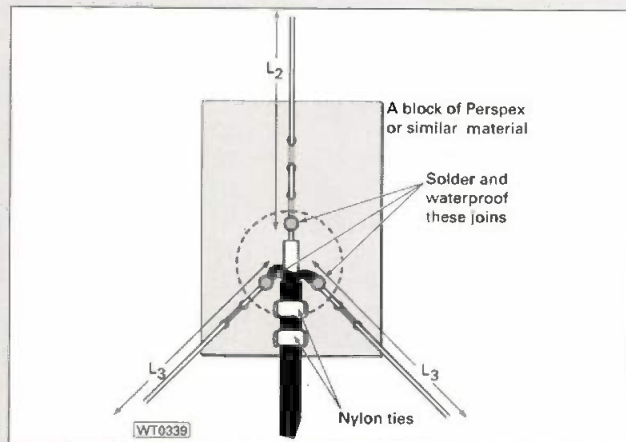


Fig. 3: A close view of the connections to the coaxial cable.

distance between the ground stakes holding down the ends of the sloping wires (L3) ranging from 13.5m on the 10MHz band down to only 4.8m for a 28MHz version.

The vertical wire L2 is soldered to the centre of the horizontal wire L1 and its lower end connected to the inner conductor of the coaxial cable. The sloping wires (L3) come down at 45° with the upper ends connect to the coaxial cable braid.

At the lower end of the sloping wires, good quality ceramic 'egg' insulators should be used to attach the tension lines. But

could be buried.

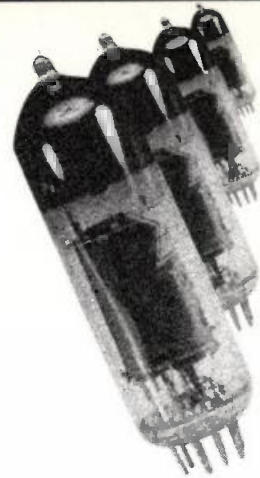
Details the junction of the elements and the coaxial cable are shown in Fig. 3. It's essential, if the antenna is to be up for any length of time, that really good weatherproofing is used at the coaxial feedpoint.

Use a sealant such as silicone rubber bathroom sealant to stop the ingress

Table 2

$L_1 = \frac{53.2}{F \text{ (MHz)}} \text{ m}$	$L_2 = \frac{39.8}{F \text{ (MHz)}} \text{ m}$	$L_3 = \frac{66.6}{F \text{ (MHz)}} \text{ m}$
$L_4 = \frac{21.3}{F \text{ (MHz)}} \text{ m}$	$L_5 = \frac{94.2}{F \text{ (MHz)}} \text{ m}$	$L_6 = \frac{136.8}{F \text{ (MHz)}} \text{ m}$

W valve & vintage



By Ben Nock G4BXD

It's Ben Nock G4BXD's turn to look after the PW vintage wireless 'shop' and he's about to invite you to literally 'take off' to an interesting museum, reminding us that he's a qualified pilot as well as being an author!

It's my turn again to man the 'vintage shop' with that emphasis (in my case) on the old amateur radio and military equipment. And to that end I've news of a nice day out for you, a couple of old US sets and much, much more!

Straight on then. If you would like to see a working R1155/T1154 set-up then I can recommend a visit to **The South Yorkshire Aircraft Museum, at Home Farm, Firbeck near Maltby**. As well as the numerous aircraft they have a nice radio shack, **GB2AIR**, with plenty of vintage equipment to see.

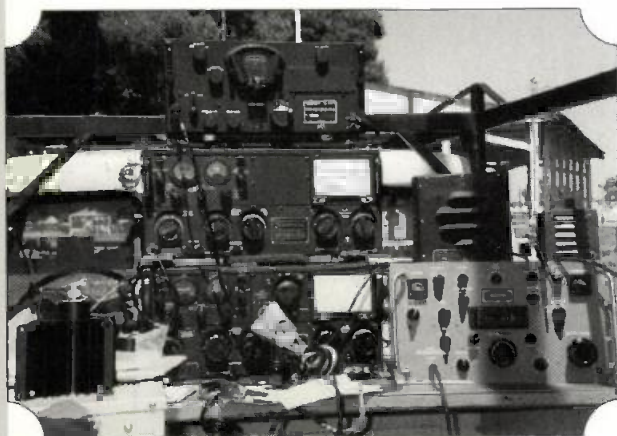
The Home Farm site is open to the public Sundays and Bank Holidays, admission is free, but please do the decent thing and leave a donation. The guys there have put a lot of effort into the museum and its certainly a nice day out.

It's especially interesting when they have the aero jumble sale combined with radio bits. I found quite a few interesting items last year and look forward to this year's show, so watch the 'Radio Diary' page for dates.

From The States

News from the United States now as I've several photos of big sets, both in size and power. **Paul N6FEG**, has been a corresponding friend now for several years, (doesn't time fly Paul)

Fig. 2: Two ART-13 transmitter units with BC-348 on top. All mobile!



and during that time I have been pleased to see many of the sets in his collection.

The photograph in **Fig. 1**, shows the lad himself manning his mobile set-up in the back of his truck. The second, **Fig. 2**, gives a better picture of the radios, far more important, showing a couple of ART-13 transmitters, with a BC-348-Q receiver on top.

The ART-13, also known as the ATC, which itself came from the 17H set, was designed by **Roy Olson WA6THD**, working for Collins Radio. The design specifications called for a set to give 100W, tune continuously from 2 to 18.1MHz plus 200 to 1500kHz, and operate at full power at altitudes of up to 20,000 feet.

The ART-13 set runs the 813 in the p.a. stage, being plate and screen modulated by a pair of 811s in class B. It's also fitted with an auto-tune facility which allows previously set channels to be returned to very quickly and precisely.

The ART-13 is, like the TCS range of sets, always referred to as a Collins. They did make the set of course, but so did many other manufacturers during its lifetime. The ART-13B (and possibly other variants) will take the CDA-T crystal unit in place of the l.f. oscillator unit.

BC-348 Receiver

The BC-348 receiver came in a number of letter suffix models which arose from different contractors and manufacturers. The early versions were designated E, H, K, L, M, P and

R, whilst the later designs include the J, N and Q varieties.

Tuning over the familiar 200 to 500kHz and 1.5 to 18.5MHz, the BC-348 measures about 8 by 18 by 9 inches and weighs 33lbs. The receiver operated from 24V, and the identical BC-224 operated from 12V.

The photograph in **Fig. 3**, shows Paul's BC-375 transmitter with the BC-348 receiver to its right. The BC-375 is a 40 to 100W transmitter covering 200 to 500kHz and 1.5 to 12.5MHz. It runs a.m., c.w. or modulated continuous wave (m.c.w.), measures about 20 by 22 by 8 inches and weighs about 40lbs.

Already outdated by the start of the Second World War, many of these sets were released to the surplus market after the war but gained the reputation of being unstable.

Aircraft with the BC-375 fitted also carried the BC-221 frequency meter. This was well known in the



Fig. 1: The 'lad himself', Paul N6FEG mobile in his truck.



UK and was used to set the transmitter onto frequency, the dial on the set being calibrated in revolutions rather than actual frequencies.

In the next photograph, Fig. 4, the ATD transmitter and accessories is shown. This set covers 540-1500kHz, 1.5 to 3MHz and 3 to 9.05MHz, 1.5 to 3MHz and 3 to 9.05MHz, runs a.m., c.w. and m.c.w. It provides 40W and measures about 11 by 23 by 13 inches and weighs a massive 70 lbs including the tuning unit.

Four separate spot frequencies can be set up on the ATD using four plug in units. There are normally two on the l.f. bands and one each for the higher bands.

With Paul's permission, I will bring you more of this collection in future issues. I would of course, welcome photographs from your collections.

Please try and keep your photographs in focus (although I realise it's a bit difficult without a single-lens reflex camera). Use

plain backgrounds if possible, and not too dark. Electronic flash is better so long as it does not 'bounce' off the surface of the set.

Fresh PYE

I've recently added a 'fresh' PYE to my collection in the form of a Wireless set No. C12. This WS No. 22 'look-alike' operates on the same band of frequencies as the 22 set.

The C12 even uses the same case as the 22 set. It also had the same problem of broadcast breakthrough as the 22 and 62 sets before it. The photograph, Fig. 5, shows the C12 front, p.s.u. left, a.t.u. top.

Again, I had to fit a high pass filter between antenna input and the receiver section of the equipment before I could resolve signals on the lower bands. However, I think this is just a combination of problems with my location though, being close to several high power broadcast sites.

Running between 5 to 8W, a.m. and c.w., the C12 was, I suppose, a replacement for the number 19 set. Brought out in the mid-1950s, mine is dated 1955 but has a REME (Royal Electrical & Mechanical Engineers) note on it suggesting it was re-built, or at least overhauled, in 1967.

Unlike the No. 19 set though, the C12 is h.f. only, 1.6 to 10MHz in two bands. There was no attempt at incorporating a v.h.f. 'B' set. Fig. 6 shows the C12's insides.

In information kindly supplied by Arthur G8PNC and Hugh G8TMA, I've found that the C12, when fitted with the correct plugs, etc., could even be used with the No. 19 set microphone and

headset arrangement. The p.a. uses the miniature 807 (the 5B245M) and at a maximum of 8W output is highly under rated, in the normal military way of things.

The inside of the C12 closely resembles that of the 22 and 62 sets. Although with the more modern, smaller, components, there is considerably more space to work in than in the older 22/62 sets.

Unfortunately, the C12 has the annoying mode of c.w. operation in that it keys the entire receiver-transmitter change-over on each key press. Though I dislike 'modifying' any item of vintage gear, to use this set on the air with the least trouble, a small modification to the c.w. keying might be in order!

Diary Date

A diary date now! Next month, the National Vintage Communications Fair takes place at the NEC on the 5th May. It's well worth a visit, with easy access and parking, very good facilities for the disabled and plenty of interesting vintage equipment around. See you there!

That's about it then. I would be very interested to hear from any readers with information on any sets or about items they would like included in this column. And although I cannot guarantee that I have, or can obtain, information on just any old set, I know a man who can!

I can be reached on packet via GB7BBS.#28.GBR.EU, via the PW offices, or direct at: 'The Radio Room', 62 Cobden St, Kidderminster, Worcestershire DY11 6RP. And don't forget that "Valves make for warmer QSOs"!

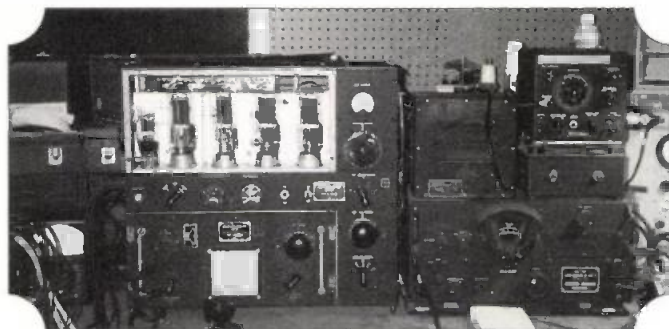


Fig. 3: Showing a BC-375 transmitter unit on the left with a BC-348 on the right, with a LM-14 frequency meter at top right of the picture.

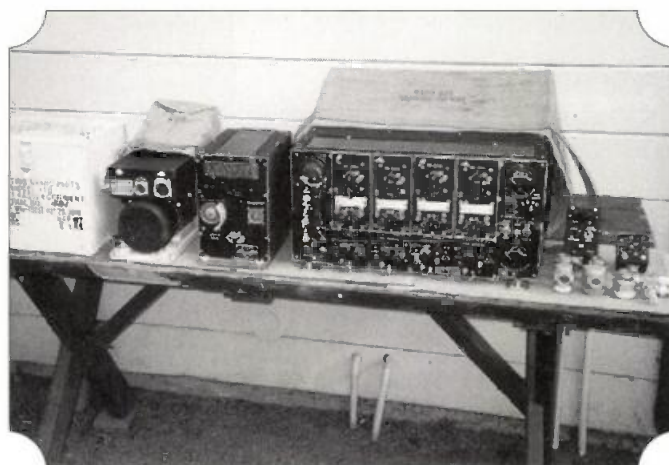


Fig. 4: The ATD transmitter unit with accessories and canvas cover.

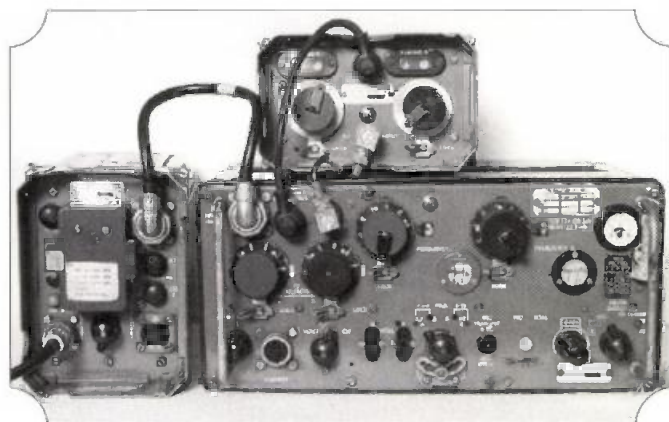


Fig. 5: The PYE C12 transmitter-receiver, p.s.u. on the left and a.t.u. on top (see text).

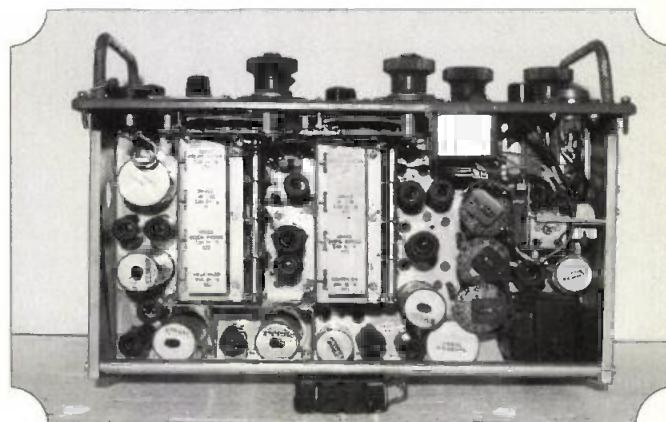


Fig. 6: Inside the C12 - p.a. top right, modulator at bottom right with the twin oscillator sections in the middle of the unit.

Cheerio from Ben, see you in August.

Electronics Servicing For The Radio Amateur

By John Beaumont G3NGD

**John Beaumont
G3NGD I.Eng. FIEIE**
explains why he
introduced an
Electronics Servicing
Course especially for
Radio Amateurs at his
local college.



Cyril Duncan G0PQU
pictured in the electronics
resource room at North
Trafford College.

Ernie Page G0NID and
David Houghton busy
checking the bandwidth of a
small audio pre-amplifier.



Many radio clubs have become increasingly concerned with the falling numbers of young people entering the world of amateur radio. In previous years, young people became interested when they picked up a local radio amateur on a commercial broadcast receiver and upon making a visit to the station were encouraged to become Radio Amateurs. I entered the field of Amateur Radio in this way and my thanks go to the late Granville Marshall G3JT and Jim Woodhouse G4HH.

When I gained my licence in 1958, transmitting equipment was either home-built or modified war surplus. The experience gained through building equipment enabled many young people to find gainful employment in the field of Telecommunications and Electronics.

Many employers preferred to employ Radio Amateurs because they continued to use their skills after a normal days work at home with their hobby. (This leads to more knowledge and possible dedication). Unfortunately due to the proliferation of 'black boxes' in recent years many Radio

Amateurs haven't a clue when it comes to fault finding to component level.

Novice Licence

The Novice Licence was originally

introduced at the time when Trade and Industry became concerned about the declining number of school leavers entering engineering especially electronics. The Novice class of licence was aimed at students in secondary schools and it was hoped that involvement with construction would create interest and lead to possible employment in the field of Electronics.

The practical element is essential for Radio Amateurs and is the weak link in the Radio Amateurs Examination (RAE). So, I planned to improve the situation.

Radio Amateurs' Course

Having taught the RAE at North Trafford College, Stretford, for eighteen years I decided (September 1994) to introduce an Electronics Servicing Course especially for Radio Amateurs. This course has been designed to enable Radio Amateurs to build and repair amateur radio and electronic equipment in a safe and competent manner.

I thought it paramount that the course should lead to a professional qualification thus enabling unemployed people the chance of possible employment in the field of modern electronics. Bearing this in mind the course has been structured on the City & Guilds of London Institute Electronics Servicing Course 224.

The course is run on a one half day per week basis for a duration of thirty six weeks. Before the students are allowed to build their own equipment they must complete a number of practical assignments which are externally assessed.

Plugs Recognised

The simple *Assignment 1* is based on wiring plugs and sockets to a recognised standard. Coaxial plugs must be connected and soldered correctly otherwise Television Interference could result. The various DIN plugs are difficult to solder as usually the insulation gets overheated. IEC plugs can be dangerous if care is not taken especially if care is not taken with those with screwed terminals.

Printed Circuits

Assignment 2 consists of constructing a printed circuit board (p.c.b.). Students must be able to identify component values and observe polarity. They must also be able drill the correct size holes in the circuit board and make good soldered joints.

Working With Veroboard

In *Assignment 3* the student gains experience in designing and constructing and working with an oscillator circuit on stripboard or Veroboard. This experience is essential when building circuits in the absence of a layout diagram.

Using Instruments

One major skill to develop is that of using instruments. This section is often overlooked when teaching the RAE mainly due to the time constraint.

There is little time for the student to gain 'hands on experience' when the

examination is conducted early in May. *Assignment 4* allows the student to compare and appreciate the effects of meter loading using Digital and Analogue meters.

The meter section is then followed by *Assignment 5* where an oscilloscope is used and the student is required to draw waveforms and calculate frequency time constant output voltages of integrating and differentiating networks.

Measure Bandwidth

Radio Amateurs need to measure bandwidth, especially in the audio section of the modulator. *Assignment 6* requires the student to measure and calculate the gain and bandwidth of an audio amplifier using a signal generator and an oscilloscope.

Power Supplies

Assignment 7 is a task-based exercise on and involving half-wave and full-wave rectification for power supplies. The student measures the amplitude and frequency of ripple waveform and the observes the effect of smoothing circuits using a cathode ray oscilloscope.

Overall Competence

Assignment 8 is to test overall student competence in the use of a multimeter and an oscilloscope. Measurements are taken of voltage and current at various parts of a complex circuit and waveforms observed on an oscilloscope are sketched and interpreted.

Finally *Assignment 9* provides an introduction to logic circuits. Here the student has to produce truth tables from observations.

Completion Of Course

On completion of the course a successful student is awarded a City & Guilds Certificate of achievement. If students have enjoyed this introduction to Electronics Servicing (and my current students have indicated so) then next year they can complete the Part I Certificate by taking a Multiple Choice Examination and an Electronics Examination Board External Trade Test.

In this test the student must complete soldering and measurement tests under the watchful eye of an external examiner in a set time. Anyone achieving this is certainly employable.

Basic Requirement

The Electronics Servicing Part I Certificate is the basic requirement for gaining employment in the electronics industry. On completion the student can then proceed to Part II.

The Part II syllabus comprises Digital and Analogue core subjects together with option Control Systems Technology or Radio & Television with of course EE Trade Test.

EQUIPMENT

SPECIFICATIONS

Ian Poole G3YWX unravels some of the mysteries behind transmitter output impedances.

The power output of any transmitter is obviously important. However, to be able to operate efficiently, the output stages need to be properly matched into the antenna system.

Older valve transmitters had to be tuned each time the frequency was changed significantly. Many readers will remember the load and tune controls which had to be adjusted to load-up the transmitter to give the optimum output. This enabled them to operate into a relatively wide range of impedances.

Today's sets do not have load and tune controls, making operation much easier. But it also means that the impedance of the antenna system seen by the transmitter is more important.

Current Dip

When a valve transmitter was loaded up, the 'load' control was advanced slightly, and then the 'tune' control was rotated until the power amplifier (p.a.) current was seen to dip. Once the bottom of the dip was found the load control could be advanced again, and then the tune control could be adjusted again for a dip. This process was repeated until the correct power level was reached.

When a valve circuit is operated at resonance with only a light load, the power dissipation within the p.a. valves is relatively small. This can be seen by the fact that there is a deep null in the p.a. current when the output is tuned to resonance.

As a result the p.a. valve can operate quite satisfactorily provided it is tuned to resonance. Obviously if it's not tuned properly the current will rise and consequently so does the valves dissipation.

In the case of a valve the effect of the matching circuit, which is normally a Pi-tank circuit (Fig. 1) is to transform the

50Ω (nominal) impedance of the antenna to the high impedance of the valve anode circuit.

For transistors the situation is quite different. Firstly most sets use a fixed tuned output designed to match to 50Ω without any further adjustment.

Fixed tuning is a great improvement because it means that the transmitter does not have to be tuned-up every time the frequency is changed. However, it does mean that when the set is operated with an incorrect load it's possible for damage to occur.

The matching circuit on the output of the p.a. transforms the 50Ω of the antenna to a much lower impedance of a few ohms suitable for the operation of the transistors. When there is a mismatch all the power is dissipated in the transistors, and more current may be drawn.

Even with relatively low levels of mismatch the output transistor or transistors can draw significantly more current and damage to the devices can result. I managed to blow up the p.a. of my Ten-Tec Argosy when the voltage standing wave ratio (v.s.w.r.) was about 2.5:1!

A further point is that when there is a poor match, any reactive components will be reflected back to the p.a. If this is seen as an inductive reactance this can lead to instability, and the generation of spurious signals.

Protection Circuitry

To help overcome some of the problems many sets have protection circuitry. These are

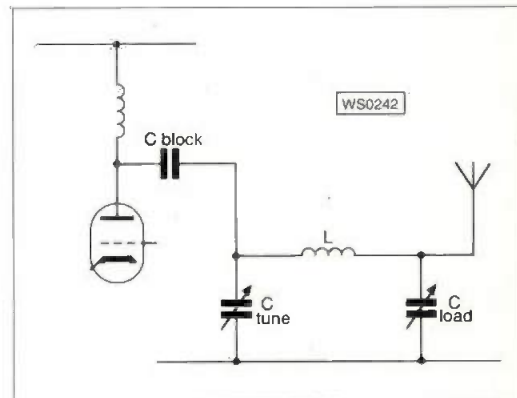


Fig. 1: A Pi-tank circuit.

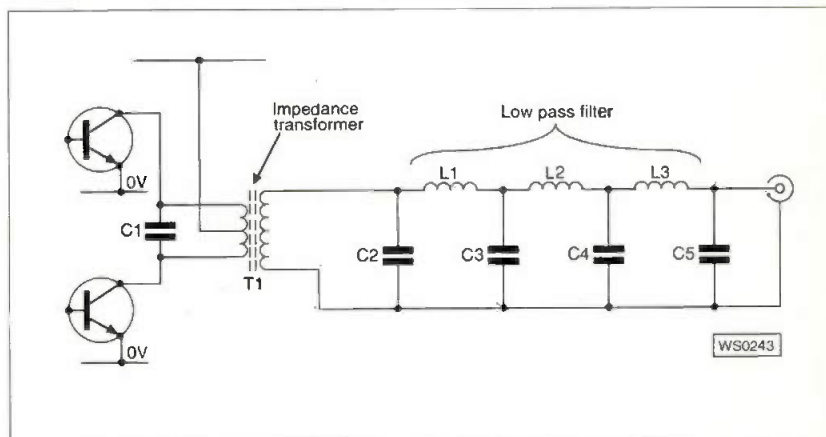


Fig. 2: A transistor p.a. and matching circuit.

included to ensure that the power output is reduced as the match to the antenna deteriorates.

Protection circuits are fine and have saved many a p.a. over the years. (I wish mine had one incorporated!). However, it does mean that the maximum output can only be obtained when there is a good match to the antenna.

The moral of all this is to reiterate that the antenna must be accurately matched to the antenna if the station is to operate correctly. To achieve this at h.f. it is best to include an a.t.u. into the circuit to ensure that even at the edge of the band, a good match can be maintained, and the maximum output obtained.

Most transmitters or transceivers include an allowable v.s.w.r. range beyond which they should not operate. Fortunately most transmitters have some form of protection, which acts to reduce the power output quite significantly when

there is a poor match.

In one review I saw recently there was a reduction of about 30% in the output power for a v.s.w.r. of only 2:1, and about 50 to 60% for a v.s.w.r. of 3:1. This indicates how important it is for the transmitter to be run into its correct load.

Investing in a good a.t.u. for the h.f. bands or a correctly matched antenna for v.h.f./u.h.f. can pay real dividends. It may even mean that it's not necessary to buy a linear to crack the pile-ups!

I hope this has helped to unravel some of your questions and queries, next time I'll be taking a look at f.m. deviation. If you'd like to write to me please send your letter c/o the Editorial Offices.

VHF REPORT

This month David Butler G4ASR takes a look at 50MHz to discover why it's called the 'Magic Band'.

The 50MHz band is probably unlike any other amateur allocation that you've ever come across. This is primarily because of its location within the r.f. spectrum.

Some say 50MHz is neither an h.f. or v.h.f. band. The reality is that it exhibits characteristics of both.

The band's unusual characteristics create a unique fascination. This is because just about every type of propagation mode 'pops up' at one time or another.

Another useful feature of the band is that, in the UK, the allocation provides plenty of space for every type of communication mode with the exception of fast-scan television.

As a generalisation therefore there are two types of operators who make use of the band. The first is the one who uses f.m. and packet radio for local communication and the second is the one who uses s.s.b. or c.w. to work DX stations.

And some operators even do both! It's true to say that the band is an acquired taste. But once you have acquired the taste you generally get hooked for life.

All Allowed

In the UK we are fortunate that all licence classes are allowed access to the 50MHz band. This includes not only A and B class licensees but also the Novice (A and B) class.

The UK allocation is 50-52MHz. The band 50-51MHz is a Primary allocation to the Amateur Radio service with a maximum allowable output power of 400W (3W output for Novices).

Between 51-52MHz the Amateur Radio service allocation is on a Secondary basis with a maximum allowable output power of 100W (3W output for Novices).

Permitted modes of operation include Morse, telephony, facsimile, slow-scan television (SSTV), radioteletype (RTTY) and data communications. Previously there were restrictions on antenna height, mobile, portable and maritime mobile operation but these have since been discontinued.

Band Plan

Fortunately, the International Amateur Radio Union (IARU) Region 1 Band Plan for the 50MHz band is very simple. Between 50.000-50.100MHz you should use Morse (c.w.) and between 50.100-50.500MHz you should use single sideband (s.s.b.) or c.w.

The rest of the band (that's from 50.500-52.000MHz) is designated as 'All Modes'. This area therefore can be used for f.m. telephony, packet radio, SSTV, facsimile, etc.

Within the Band Plan though there are certain frequencies, meeting places if you like, where specialist activities can be found. These frequencies (or sub-bands) are termed 'Usage'.

Generally speaking band usage is co-ordinated across IARU Region 1 but it doesn't necessarily have to be. For example beacon sub-bands, c.w., s.s.b., SSTV and meteor scatter calling frequencies need to be co-ordinated on a European wide basis.

However, localised GB2RS news bulletins, slow Morse transmissions and emergency communications channels don't need the same level of co-ordination. (You'll find an up-to-date listing of band usage in *The 1996 RSGB Amateur Radio Call Book*).

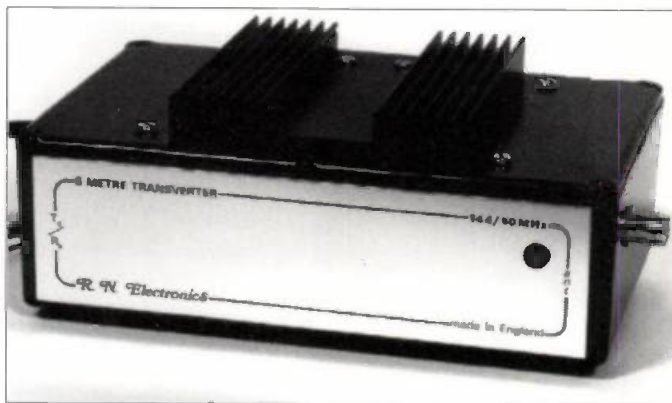
Some frequencies worth noting however, are 50.090MHz for c.w. calling, 50.200MHz for s.s.b. calling and 51.510MHz for f.m. calling. Other specialist frequencies include 50.510MHz for SSTV, 50.550MHz for facsimile and 50.600MHz for RTTY.

The packet radio sub-band is from 50.630-50.750MHz, using 20kHz channel spacing. The f.m. telephony sub-band is from 51.410-51.590MHz also with 20kHz channel spacing.

The long distance (DX) operator also has some centres of activity. These include 50.185MHz for cross-band working, 50.300MHz for c.w. meteor scatter and 50.350MHz for s.s.b. meteor scatter.

Cross Band Working

Cross-band working, by the way, enables operators without 50MHz authorisation (or transmit



David Butler G4ASR says that transverters can provide easy access to the 50MHz, the 'Magic Band'. The model shown is made by R. N. Electronics (see text).

equipment) to participate in the excitement of the band. Typically they can be found on 28.885MHz (or even 144.185MHz) calling for cross-band contacts.

The DXer should also remember that a DX 'window' exists between 50.100-50.130MHz, with an inter-continental calling frequency on 50.110MHz. In theory this DX window should only be used for contacts between stations in different continents.

Additionally, QSOs should not be made on the 50.110MHz calling frequency. After all you don't expect operators to use the s.s.b. calling frequency 144.300MHz for QSOs so why do it on the 50MHz band?

Regrettably QSOs on 50.110MHz is what happens in reality. But worse than this it's also being used for local c.w. and s.s.b. calling, meteor scatter QSOs and virtually everything else!

So, my message to you is to avoid 50.110MHz. Go further up the band and you'll actually discover you can increase your chances of making a contact!

Multi-mode Transceivers

One of the reasons why the 50MHz band has become very popular is the availability in recent years of multi-mode transceivers which cover not only the h.f. bands but also include the 50MHz band.

For example, there's the Alinco DX-70, Kenwood TS-690S, Icom IC-706 or the Yaesu FT-650 to name but a few. And of course there's also a number of v.h.f. transceivers designed specifically for the 50MHz band.

Operators who prefer to operate

only on f.m. (telephony or packet radio) will also find a suitable choice from a number of manufacturers.

If you already have an h.f. or v.h.f. transceiver a relatively inexpensive way of accessing the band is by using a transverter. This unit simply converts the output of your existing transceiver (typically 28 or 144MHz) to the 50MHz band.

On receive the transverter converts the 50MHz band to 28 or 144MHz as appropriate. A number of commercial transverters, such as the **Microwave Modules MMT50-28** (who can be contacted at **Advanced Radio Technology, ART House, 71 Leysholme Crescent, Wortley, Leeds LS12 4HH. Tel: 0113-289 0100**), the **MuTek TVVF50c**, (who can be contacted at **PO Box 24, Long Eaton, Notts NG10 4NQ Tel: 0115-972 9467**) or the **R.N. Electronics 144/50**, (of **1 Arnolds Court, Arnolds Farm Lane, Mountnessing, Essex CM13 1UT. Tel: (01277) 352219**), are available and provide an attractive way of getting onto this v.h.f. band.

Choice Of Antennas

The choice of antenna is normally dictated by the communication modes that you normally use. If you want to work DX on s.s.b. or c.w. then it's best to have some sort of horizontally mounted beam antenna.

Of course, I'm not saying you can't work DX with a simple dipole or even a vertical antenna. It just means you stand much more of a fighting chance with a beam.

As a start you could try a simple 2-element Yagi for this season. Then you could perhaps exchange it for something more ambitious when the bug catches.

World-wide F2-layer propagation will be experienced relatively soon. So start planning your expansion now!

If you're only interested in local omni-directional communication then I suggest you invest in a vertical antenna. Perhaps you should try the design I described in

are not necessarily required to work long distances.

During the summer Sp-E season you can work all round Europe with only 10W and a dipole. Many operators including novices (with even lower power) do this year after year.

It's because of the geographical

attention to the band during this summer. And don't say I didn't warn you!

Further Indications

Further indications of good conditions during this summer are also based on evidence of this winter's Sp-E season. It's normally expected that a minor peak in Sp-E activity will occur during the months of December and January.

This winter season's was even better than last year's (and that one exceeded all expectations in terms of duration and the number of openings). Between December 17 and February 29 there were a total of 19 days when openings were recorded in the UK.

For the record, there were 12 days of openings the previous winter. And in the year before that Sp-E failed to materialise at all!

More Countries

Every year a few more countries around the world obtain authorisation to operate on the 50MHz band. One of the last remaining European countries without a 50MHz allocation is Monaco.

However, I'm pleased to announce that there is a possibility that permits may be allowed in Monaco this year. This follows a meeting in 1995 between the Amateur Radio Association of Monaco (ARM) and Government officials.

The outcome of the Monaco meeting was that no problems were foreseen in allowing permits to be granted to permanent residents. The exact frequency allocation and power levels have still to be confirmed but it's hoped to obtain an allocation in the range 50.150 - 51.200MHz with an output power of 25W.

News

News has it that **SU2MT** in Egypt has equipment for the 50MHz but at the present time he does not have permission to operate on the band. However, this may change soon as he is trying to get a permit for both the 10 and 50MHz bands.

Another station in the African continent to look out for is **9G1YR** in Ghana. He has a Yaesu FT-736 transceiver and appears quite keen in becoming active on the band. If you work him the QSL cards go via G4XTA.

A DXpedition to Sable Island (GN03), using the callsign **CY0AA**, will take place between June 18 to July 2. The group, consisting of **VE9AA**, **WA8JOC** and **W90EH**, will be concentrating their efforts on the 50MHz band, especially beaming towards Europe.

As the Sable Island expedition will occur during the peak of the Sp-E season it suggests a high probability that many contacts will be made throughout Europe. The equipment will include three Icom IC-706 transceivers (100W output), a selection of antennas including an 11-element long boom Yagi and an amplifier or two!

The expedition is extremely costly, so it's hoped that 50MHz DXers will support the project. The UK Six Metre Group has already made a large donation and donations from individuals are also welcomed.

Contributions may be sent to: **Mike Smith VE9AA, 131 Smith Road, Geary, New Brunswick, Canada E2V 2G3**. Please make sure you enclose your callsign with any donation as a record will be kept. Further up-dates can be found on the Internet at either <http://www.cam.org/~dino/sable.html> or at <http://www.accessone.com:80/~vboobk/1996feb/cy0aa.htm>

Members of the Northern VHF Activity Group (G7UEG) will be operating from various Worked All Britain (WAB) squares in the Orkney Islands during the period June 29 - July 7. Look out for **GS7UEG/P** on 50.222MHz and 144.222MHz. Further details can be obtained from: **G7DKX @ GB7GBY** or via the DX Cluster.

From June 6 for four weeks **Brian Alderson G3KJX** will be using the callsign **CT1/G3KJX** from a location in the Algarve. He will be operating on the 50MHz band running 3W from a *PW* Meon transverter into a bi-square antenna.

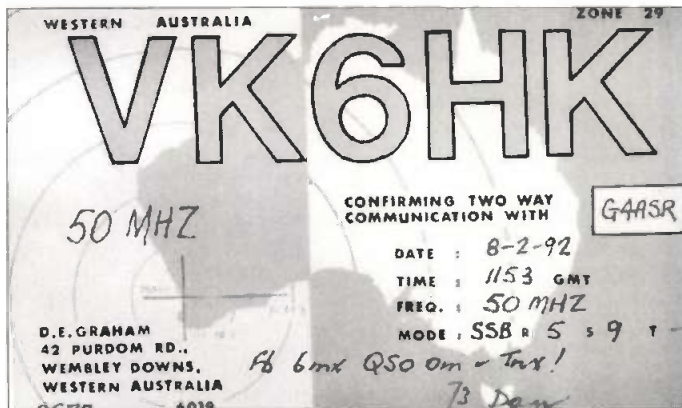
Deadline Time

Deadline time again! As usual please send any news (to reach me by the end of the month) to: **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP**.

You can also contact me via packet radio @ **GB7MAD**, the DX Cluster @ **GB7DXC** or E-Mail via davebu@mdlhr1.igw.bt.co.uk. Alternatively you can telephone me on (01873) 860679.

Cheerio for now!

UK Six Metre Group
Enquiries for membership of the UK Six Metre Group (UKSMG) should go to: **Chris Gare G3WOS, Old White Lodge, 183 Sycamore Road, Farnborough, Hampshire GU14 6RF**.



There's some excellent DX waiting just round the corner on 50MHz!

'Antenna Workshop' in the January 1996 issue.

Propagation Modes

As I have previously mentioned, the 50MHz band experiences propagation modes common to both the v.h.f. and h.f. bands. The v.h.f. modes include tropo, aurora, scatter modes (ionospheric and meteor) and E-layer propagation, the most common type being Sporadic-E (Sp-E).

The various modes occur regularly, year in, year out, and have been fully described in previous columns. Some, such as aurora or Sp-E are linked to the state of the solar or sun spot cycle.

As a generalisation it can be stated that auroras are more prevalent around sun spot maximum and that Sp-E tends to be better around sun spot minimum. The h.f. characteristics experienced on the 50MHz band are also linked directly to the state of the sun spot cycle.

The prime DX mode is F2-layer propagation and occurs during years around the peak of the solar cycle. You have a few years to wait before F2 propagation returns, but when it does you'll certainly know about it! The 50MHz band will literally be open to all continents for months at a time.

World-Wide DX

The attraction of working world-wide DX is one of reasons why so many people become addicted to the 50MHz band. The interesting point is that high power and large antennas

selectivity of Sp-E and the intensity of some openings that surprising results can be achieved with low power.

The same is equally true when F2 propagation is encountered on 50MHz. Some years ago (at the peak of solar cycle 22) I reported that many QRP stations had worked as far as Australia on the 50MHz band. Believe me it's true and it will happen again in four or five years time.

Propagation Summer

It's very possible that Sp-E propagation on the 50MHz band could be very good this summer. This is based on the presumption that Sp-E propagation is more prevalent during Sun Spot minimum. This state of affairs incidentally is predicted to occur some time later this year.

Conditions were very good in 1995 with 10 days of multi-hop transatlantic openings occurring in June. There were then a further eight days of openings during the first two weeks of July.

Note that the events mentioned were between North America and the UK and that a much larger number were recorded to other areas of Europe within the same period. Contrast these results with the 1994 season when only three days of transatlantic openings were recorded in the UK in total.

Indeed, it's interesting to note that in the 11-year period between 1984-1994 only a total of 15 openings were observed in the month of June. And there were even fewer, six in number, during July. (Statistically a good reason to pay particular

HF FAR & WIDE

Leighton Smart GWOLBI takes his regular look at PW reader's h.f. log books.

I'll start this month with some information which came from the pen of **Frank Watts G5BM**. Frank writes about the activities of **GM0HCQ/MM**. The station is operated by **Mike Glostein GM0HCQ** who hails from Argyll in Scotland, and who is Radio Officer on the British Antarctic Supply Ship *Bransfield*, which keeps the bases supplied with stores, etc.

Mike works 10.122MHz c.w. and Frank first contacted him when the *Bransfield* was bound for the Antarctic mainland. There they had 24 hours of daylight and, says Frank, a temperature of minus 6 in the summer!

Unfortunately Mike had a very unpleasant experience on the way when he had to climb the ship's conning tower in a Force 6 snowstorm to repair the commercial antenna. This should make us amateurs feel that we're much luckier as we sit in our nice warm shacks!

The equipment Mike uses is a commercial transmitter, with a separate receiver. For the commercial skeds, a power output of up to 750W is available, and the antenna is a 30m vertical.

Bransfield 'plies her trade' between the UK and the Antarctic via the Falkland Islands (VP8). So maybe it would be a good idea to listen around the 10.122MHz spot where Frank has worked **GM0HCQ/MM** on a fairly regular basis.

Talking of Antarctica, a photograph arrived from s.w.l. **Richard Williams** of **Deddington**, showing the QTH of **CE9/GONKZ** in Antarctica, taken in October last year. **Kenn Everard**, the operator, says he was living in the tent, **Fig. 1**, from October last year to January this year. I reckon he must be made of stern stuff!

Meanwhile, regular s.w.l. reporter to the column, **David Henry** from **Aberdeen**, apologises for missing the deadline, but has a perfectly acceptable excuse - he has passed the RAE and is currently going 'hammer and tongs' for the c.w. So, congratulations go to **David**, who is now also known as **GM7VZV!** Well done!

(Congratulations also from the PW team **David**. **Editor**.)

Other DX News

From *The RSGB DX Newsheet* comes other DX news regarding the proposed **Kermadec Island** expedition. **Ken ZL2HU** has said that preparations are going well, and that it's hoped that they will be operational between the 4th and 14th of May.

There's also news of **Francois TJ1AG**. He is on the air daily between 2000 - 2300UTC in the African Net on 7.065MHz, QSL via **F5RUQ**.

The Amateur Radio Society of India says that **Mani VU2JPS** does not have permission to operate from **Port Blair** in the **Andaman Islands**. It appears that the Indian Government has not approved any operation from there for the past several years.

Band Conditions

Once again it seems that our reporters are more or less in agreement over prevailing conditions on the bands. Overall conditions seem to have ranged from 'poor' to 'good at times'.

Although personally I've been concentrating on the lower frequency bands of late. And I have found them reasonably good for the time of year (February).

It's at about this point in the year when the l.f. bands (1.8, 3.5 and 7MHz) start to deteriorate. What were powerful signals from **Australia**, **New Zealand**, etc., start to fall into the increasing noise levels.

However, all is not lost, as our monthly reporters show! It's possible to work DX even when conditions are judged by most of us to be 'poor'. More often than not, it's just knowing where, and perhaps more importantly, when, conditions are liable to peak to certain parts of the world.

I remember that, when I was first licensed, for some reason I always thought that the only time to work



Fig. 1: Kenn Everard GONKZ, operating as CE9/GONKZ lived in this tent in the Patriot Hill of Antarctica from October 1995 to January 1996. A tough operator indeed! (see text).

Australia was in the early hours of the morning, just past midnight on 14MHz. Therefore, my only contacts with this part of the world was at around 0100UTC onwards, and I had to struggle at that!

Later, through the experience of others, I learned that mid to late afternoon was a good time to contact **Australia**. Albeit by a different path.

I found that my **Australian** contacts at the later time of day were not so difficult, and for that reason were far more enjoyable. It just goes to show what a little knowledge can do for your operating doesn't it?

Your Reports

I'm starting your 1.8 and 3.5MHz reports this month with **Don Mclean G3NOF** in **Yeovil**. **Don** in his regular monthly propagation report indicates that conditions have been very similar to last month.

Don says that on 3.5MHz there were strong signals from **North America** and the **Middle East** from 2100UTC onwards. Using a **Kenwood TS-950** transceiver and trapped dipole antenna, he reports working **KG4SH** (**Guantanamo Bay**) at 0043UTC, and **K01F** (**USA**) both on s.s.b.

Ted Trowell G2HKU in **Kent** meanwhile lists his 1.8MHz c.w. contacts using around 70W of power with **N2NT** (**USA**) at 0600UTC, **OY9JD** (**Faroe Islands**), **UA9FX** (**Asiatic Russia**), **ZA1AJ** (**Albania**), and **4X4NJ** (**Israel**) all at around 2200UTC. For 3.5MHz, **Ted** offers **XF3/OH3JF** (**Mexico**), **T14SU/5** (**Costa Rica**), and **J77A** (**Dominica**)

at 0800, plus **W4QM/MM** off the coast of **Bahrain** at around 2000UTC.

Now to s.w.l. **Charlie Blake RS96034** in **Milton Keynes**. **Charlie**, using an **NRD 525** receiver and long wire receive antenna reports 3.5MHz s.s.b. reception of **4S7EA** (**Sri Lanka**) working **HA8XX** (**Hungary**) at 2223UTC, and **V01RAA** (**Newfoundland**) in contact with **IC8SDL** (**Italy**) at around 0629. Keen QRP operator **Richard Evans G0VCW** in **Northamptonshire** lists one contact on 3.5MHz with **VP2MEY** (**Montserrat**) at 3.797MHz with a mere 8W of s.s.b.

The 7MHz Band

Up to '40' now, and **Carl Mason GWOVSW** in **Skewen**, southern **Wales**, who has been busy on the 7MHz band. He worked **429FIG** (**Karkur, Russia**) at 0017, **SV1CDN/3** (**Greece**) at 1853UTC, and **SM5DYC** (**Sweden**) at 1647, on c.w., while s.s.b. accounted for contacts with **ON4AGH** (**Belgium**), at 0856, and **EW1MM** (**Byearus**) at 1551, with a **G5RV** dipole and 100W output.

Ted G2HKU reports his c.w. contacts with **VK3RP** (**Australia**) at 0800UTC, **P40WA** (**Aruba**, **Netherlands Antilles**) and **HAM6NA** (**Hungary**) at 0900. He also worked **R1FJZ** (**Franz Josef Land**) at 1600UTC, and at around 1900 **K1JKS** (**USA**), and **EA8CN** (**Canary Islands**, **North Africa**).

The regular listening spot for **Charlie RS96034** is 7MHz. But **Charlie** says that "listening between 0600 and 0800UTC has been a waste of time". His log indicates s.s.b. reception of

Practical Wireless Listening & Operating Watch

All times in UTC

EA3FWZ (Spain) in contact with Kevin G00MS at 0731UTC, 7X2GD (Algeria) working OeM8MOK (Austria) at 0710, CP6VP (Bolivia) in contact with F6EZR at 0720.

Charlie also heard LZ5DB/M (bicycle mobile in Bulgaria, using a 144MHz v.h.f. link!) working S51WP in Slovenia at 0719UTC. There was also HB0/PA3EBT/P (Lichtenstein) working Jim G4WXX at 1548, A71DI (Qatar) working IK8HOB (Italy) at 2246, and JA9CNG (Japan) in contact with SM5VS (Sweden). Richard G0VCW reports just the one low power c.w. contact on 7MHz, with 1A0KM (the Sovereign Military Order of Malta) with 5W.

The 14MHz Band

Again, the 14MHz band is 'where it's at' these days. Don G3NOF's propagation report informs us that the higher bands have only been open during daylight, and that on 14MHz, the long path has been open to the far East and Australia from 0900UTC onwards. In the afternoons, there have been good conditions to North America from 1500, and African stations have been heard at around 1700.

Don lists s.s.b. contacts with EL2AY (Liberia) at 1803UTC, QSL to WA3HUP, FG5FC (Guadeloupe) at 1735, IM0MBP (St. Peters Island) at 0900, J53UAW (Guinea Bissau) at 0953. He also logged JA2KSI (Japan) at 0950, JX9ZP (Jan Mayen Island) at 1106 QSL to Box 8099, Jan Mayen Island, Norway, PT2GTI/PY1 (Babo Fro Island) at 1001.

Also logged were VK4AAR (Australia) at 1000UTC, VP5/JJ2QXI (Turks & Caicos Islands) at 1830, Y09CWV/D2 (Angola) at 0934, ZSM6A (South Africa) QSL to WA3HUP, ZV3A (Torres Island) at 1005 QSL to PY3ACC, 9G1BJ (Ghana) at 1809. Finally there was 9L1PG (Sierra Leone) at 1911UTC.

Now over to s.w.l. Len Stockwell, in Grays, Essex, who uses a Yaesu FRG100 receiver and a G5RV dipole 7m above ground. Len's 14MHz s.s.b. report includes reception of ES7FQ (Estonia) at 1246UTC, TA2IN (Turkey) at 1337, 4X6UO (Israel) at 1350, NI8LNI (USA) at 1351, 3V8BB (Tunisia) at 1355, 9K2YY (Kuwait) at 12.16, and ZB2HW (the rock of Gibraltar) at 1352UTC.

"The shack has been rather cold!" says our intrepid Bristolian reporter Gordon Foote G7NCR. (This explains his shorter than usual log

this month!). That's okay Gordon, we'll forgive you!

Gordon has logged s.s.b. reception of IK7QHF (Italy) working John G0KQP in Leeds and Jim G3ZQQ in Kidderminster. He also heard N2IL (USA) working Tony G3JSF in Hastings.

Carl GW0VSW ran 100W s.s.b. and c.w. to contact CX5RV in Uruguay, (otherwise known as G5RV) at 0028UTC, LU6Z (Argentina) at 0917, 9L1PG (Sierra Leone) at 1708. He also worked V31A (Belize) at 1911, JF4AIS (Japan) at 0834, 9H1BO (Malta) at 1225, and WB1GQR (Vermont, USA) at 1635UTC.

Charlie RS96034 reports reception of YI1GHF (Baghdad, Iraq) working UR5MGQ at 0746, EA5/G3PNF (Spain) in contact with Jim G3PRR at 1105UTC. Also logged were 3V8BB (Tunisia) working N4GNR at 1324UTC, A4LD (Sultanate of Oman) in contact with UT2LF at 0800, R1/G4XLA (Russia) working UR5FF at 1029, and Z31ET (Macedonia) working 4X1EL at 1026UTC.

Ted G2HKU has been busy on 14MHz too. He's listed two-way c.w. contacts with OY1CT (Faroe Islands) at 1100UTC, VU2BK (India) at 1200, 4X4NJ (Israel) and 5N3/SP5XAR (Nigeria) at 1500, VE3BHZ (Canada), N4AR (USA) and EA8CN (Canary Islands) at 1600UTC.

The 18 & 21MHz Bands

The 18 and 21MHz bands still show signs of life, and it's hoped that we will see a marked improvement over the coming two or three years. However, only time will tell!

Now on to reports starting with Richard G0VCW who reports QRP contacts with CU1AC (Azores Islands) and ZL4DJ (New Zealand) with up to 10W s.s.b., and KZ1H (USA) with 3W c.w. on 18MHz. His 21MHz contacts included 9K2HN (Kuwait) with 5W s.s.b., and KB2TWK (USA) with 3W of c.w.

Don G3NOF found some interesting stuff on 18MHz. These included A4KT (Oman) at 1132UTC, FG5HR (Guadeloupe) at 1652 QSL via F6BUM, special event station K8YSE/200 (USA), LU1FXD (Argentina) and PJ8AD (Leeward Islands) at 1249UTC.

Also logged by G3NOF were SV2ASP (Greece) at 1328UTC, TA2ZP (Turkey) at 1340 QSL to JA2BDR, VE7GAS/VP9 (Bermuda) at 1455, VK6ZB (Australia) at 1052,

VK9CR (Cocos-keeling Island) at 1050UTC.

Still busy, G3NOF reports VP5/JJ2QXI (Turks & Caicos Island) at 1450UTC, YB2ARW (Indonesia) at 1305, Z21GN (Zimbabwe) at 1551, ZP5KW (Paraguay) at 1500, 5N0PYL (Nigeria) at 1508, 8P9FC (Barbados) at 1324, 9G1BS (Ghana) at 1544, 9K2HN (Kuwait) at 1200. Also logged were 9L1PG (Sierra Leone) at 1213, 9U/F5FHI (Burundi) at 1602 QSL to F2VX or own call via bureau, and finally 9Y4NW (Trinidad & Tobago) at 1623UTC.

Penultimately, we return to Charlie RS96034 now, who lists 18MHz reception of 5N0/DK1MU (Nigeria) at 1134UTC (QSL via OK1DCH), LZ1KVZ (Bulgaria) working Steve G0UIH/M at 1106UTC. Then he logged EA8BYR (Canary Islands) working Len G4VRI, 9H4CM (Gozo Island) working SM4IJ, as well as N1BIE/MM in the Persian Gulf working GM4ZJ at 1336UTC.

And finally for this month, it's back to Ted G2HKU, who says he found conditions this past month not too good when he's been around! His list includes c.w. contacts with RW6AM/MM on the MV *Omskiy* in the Sea of Azov, bound for Yalta at 1100UTC, 5N0DK1MU (Nigeria), and VP5/KV1Y (Turks & Caicos Islands) at 1500UTC all on 18MHz.

Ted's short list for 21MHz offers LU500F (Argentina) at 1300. And to round off he reports W4/G0IHM (USA) and P4/K2LE (Aruba, Netherlands Antilles) at 1500UTC.

QRT Time

Well that wraps things up for this month as it's QRT time! It would have been easier if my computer hadn't 'died' just as I started to put the column together, forcing me to remain at work the following evening until 11.30pm to get it typed up! (Your dedication is appreciated by all Leighton! Editor).

Again, my grateful thanks to our reporters for their invaluable assistance and commitment to the column. Cheerio for now and keep reporting.

As usual, reports and information to me by the 15th of each month to: Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Mid-Glamorgan, CF46 6DB. Tel: (01443) 411459.

Charlie Blake RS96034 listens: 0500-0700 on 7.061MHz s.s.b. with an NRD 525 receiver & sloping wire antenna.

Steve Locke GWOSGL operates: 1100-1500 most days around 14.180MHz s.s.b using a Kenwood TS-940 transceiver and TH7 beam antenna.

Don McLean G3NOF operates: 1030 Saturdays on 3.685MHz on the International Short Wave League net or 1030 Sundays on the Yeovil ARC net using a Kenwood TS-950 transceiver and trapped dipole antenna.

Leighton Smart GW0LBI operates: Every Sunday at around 1100 on 28.500MHz s.s.b. using a Ham International Concorde transceiver and wire dipole antenna.

Rob Mannion G3XFD (although temporarily QRT because of gale damage to antennas in February, and awaiting fine weekend to re-install them!) normally listens and operates: (weekdays & weekends) 1800-1830 on 3.7MHz 100W s.s.b. & 3.530MHz QRP c.w. using a KW2000B/Trio TS-120V and trap dipole/long wire antennas. Also at 2300 on either 3.530, 7.025MHz (c.w.) or 3.7MHz s.s.b. Occasionally on 7.025MHz c.w. between 0100-0200.

Gordon Foote G7NCR listens: 1730-1930 & 2030-2200 (weekdays) and 1430-1630 (weekends) on 14.250MHz s.s.b. using a Howes DcRx receiver and loft mounted receive antenna.

T. Ibbotson G0VTI operates: each evening between 1900-2000 on or around 7.020MHz c.w. or 14.035MHz c.w. using a Ten Tec Scout transceiver at 50W.

BITS & BYTES

- COMPUTING
IN RADIO

Mike Richards G4WNC has news of a new Scientific CD-ROM, and a computer based callbook but starts off with details of his new E-mail address.

Please note my new E-mail address at the foot of the column. Having looked around at what's available, I decided that the Pipex offer to ex-BBC Networking Club members was a pretty good deal.

As the BBC Networking Club used Pipex to supply their Internet access, I've effectively been using Pipex for the past year. Throughout that time I've received very good access at local call rates and can't remember the last time I heard the engaged tone! Another attraction of the Pipex deal is their offer to divert mail from my old E-mail address (at no extra cost) until November '96.

Latest Shareware



Rod Smith of the Public Domain and Shareware Library (PDSL)

has written with details of the latest shareware CD-ROM. The Scientific and Technical Library contains a host of hard-to-find specialist technical programs for DOS and Windows.

There are over 2000 programs on the Scientific and Technical Library CD-ROM covering topics such as Artificial Intelligence, Astronomy, Communications, Electronics, Ham Radio, Technical Drawing and Utilities to name but a few. The CD-ROM costs £29 and is available from the Public Domain Shareware Library, Winscombe House, Beacon Road, Crowborough TN6 1UL. Tel: (01892) 663298.

Disk Call Book

I've just received a review copy disk of the latest CD-ROM from the US company Radio Amateur Callbooks. The CD-ROM operates with Windows 3.1, '95 and good old DOS.

Installation on Windows '95 and 3.1 was very simple and used the standard SETUP.EXE method. The installation routine took-up minimal space on the hard disk as all the data and search files were kept on the CD-ROM.

When operating, the callbook displays the licence details one

entry at a time with the amount of information available dependant of which database had been selected. There are two options here - International listing or North American.

The North American listing provided very comprehensive information right down to the station's latitude and longitude! Searching within the North American database could be done on most of the fields.

The International listing was restricted to either callsign or text searches. However, the text search was particularly impressive. As you type in the search word, the program would present a list of near matches that you could use to complete the entry.

Once the search word had been entered, the number of database hits is displayed. This is great for gauging the effectiveness of your search parameters. You can add up to 14 words to this search which should prove more than adequate. This highly flexible search was great for finding people when you know just a just a few of details, e.g. surname and town.

The search was also very rapid, taking just 2-3 seconds, even with my ageing double speed CD-ROM drive. But although the search facilities were well thought out I didn't like the way ex-directory entries were shown.

Instead of the usual 'particulars withheld' combined with the first three characters of the postcode, the database just reported QSL via the bureau. Not only was this misleading because the licence holder may have no interest in QSLing, but the loss of postcode data means you have no idea where they live.

Another odd point was the incremental steps provided for manual searching. Once a record has been selected you can step up or down by 1, 10, 100 or 1000 records at a time - why on earth would anyone want to step through a callsign database 1000 at a time?

As to the integrity of the database, I certainly managed to find a few anomalies. For example, my old B licence G8HHA is still shown even though it was superseded by my A licence in 1983!



I tried the test with a few other old calls - some were shown others weren't. I wonder just how many of the claimed 1 314 000 listed amateurs are out-of-date duplicates?

In addition to the main database functions, this CD-ROM included a selection of text files covering a wide range of radio data. A few examples were beacons, country list, Q Codes, Prefixes and Telegraph codes.

The 1996 Radio Amateur Call Book is available from the PW Book Service price £35 plus P&P. My thanks to PW Publishing for the loan of the review copy.

Surfing Interconnections

Whilst surfing the 'Net the other day I came across a useful site that provides full interconnections data for a wide range of TNCs/Data Controllers and radios. The site is provided and maintained by Gloria Medcalf KA5ZTX and can be found at <http://www.idir.net/~medcalf/ztx/wire/index.html>

That's all the computing news I've got for this month, so until next time 'happy computing' and don't forget to keep your letters coming to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3ZD. CompuServe 100411,3444; Internet mike.richards@dial.pipex.com

Special Offers

Here's the full list of reader's offers with all the latest software. Please leave up to two weeks for delivery.

IBM PC Software (1.44Mb disks):

- Disk A (Order Code DKA) - JVFAX 7.0, HAMCOMM 3.0 and WEFAX 3.2.
- Disk B (Order Code DKB) - DSP Starter plus Texas device selection software.
- Disk C (Order Code DKC) - NuMorse 1.3.
- Disk D (Order Code DKD) - UltraPak 4.0.
- Disk E (Order Code DKE) - Mscan 1.3 and 2.0.

Printed Literature:

- Beginner's Utility Frequency List (Order Code BL).
- Complex Signals Utility Frequency List (Order Code AL).
- Decode Utility Frequency List (Order Code DL).
- FactPack 1 Solving Computer Interference Problems (Order Code FP1).
- FactPack 2 Decoding Accessories (Order Code FP2).
- FactPack 3 Starting Utility Decoding (Order Code FP3).
- FactPack 4 JVFAX and HAMCOMM Primer (Order Code FP4).
- FactPack 5 On the Air with JVFAX and HAMCOMM (Order Code FP5).
- FactPack 6 Internet Starter (Order Code FP6).

For the printed literature just send a self addressed sticky label plus 50p per item (£1.50 for four, £2.50 for seven and £3.00 for nine). For software send £1.00 per disk (£1.75 for two, £2.50 for three or £3.00 for four and £3.75 for all five) and a self addressed sticky label (don't forget I provided the disk!). Please make cheques payable to M. Richards.

BROADCAST ROUND-UP

Peter Shore takes his monthly trip around the broadcast bands with news from Radio Canada, the BBC World Service and a selection of interesting programme schedules.

reported last month that **Radio Canada International's** (RCI) future looked more secure than it did just before Christmas, when all staff were issued redundancy notices. The end of March was the date given for the station to close because the Canadian Broadcasting Corporation (CBC), faced with an enormous shortfall in its budget, had decided it could no longer afford to pay for an international service. The Canadian government also refused to meet the cost.

But **Prime Minister Chretien** reshuffled his cabinet, and in came two people more enthusiastic about the need for Canada to present itself to the outside world by international radio. **Sheila Copps**, Heritage Minister, said RCI 'was a strong voice and should not be allowed to die'.

And somehow Sheila managed to persuade her new colleague, the Foreign Affairs Minister **Lloyd Axworthy**, to find part of the money to run the station for the twelve months from April 1996. The CBC agreed to find the balance.

Therefore Radio Canada International continues on the international airwaves in much the same form as before. It remains to be seen what happens later this year when budgets are set for the 1997-98 financial year.

Back on this side of the Atlantic, Britain's *Daily Telegraph* newspaper reported on March 5 that **BBC World Service** is to launch a news and information channel in addition to the existing English language network.

Popular programmes like *Outlook* will be heard on both channels. No firm information is available about possible start dates.

The new schedules launched at the beginning of April do not seem greatly different from those in previous years. Except, that is, for the fact that *Waveguide* has disappeared.

The weekly *Waveguide* programme has been on the air since 1980, and followed on from the long-running *World Radio Club*. The reason for the sudden demise of the show? Apparently no ten minute slots are available in the BBC's

international schedules any more. But there will be a special series of the programme running for eight weeks in the autumn.

The special *Waveguide* series was not enough to quell the passions of people on the **rec.radio.shortwave** Internet newsgroup. They complained bitterly, and some suggested that the BBC was intentionally driving listeners to **Radio Netherlands** and the **Voice of America**, both of which have half-hour media and communications programmes.

Maybe if enough listeners protest, the decision will be reversed. After all, it happened with Radio 4 and the I.w./f.m. arguments! (see 'Keylines' in this issue. Editor).

Extra Radio Signals

St Patrick's Day was auspicious this year. As always it fell on March 17, but on this occasion the saints' heavenly view of earth might have been a might more obscured than usual, as the ether had extra Irish programmes travelling in it!

Mid-West Radio in County Mayo took itself on to the international wavebands with several hours of programmes beamed to Europe and North America. The station hired time on two 250kW transmitters in the UK (no prizes for guessing that the BBC World Service was the renter - it provided transmission facilities for the All Ireland Hurling Final last year), beaming on 11.715MHz to Europe from 1200 to 1600UTC, and from 0000 to 0200 the following day on 7.325MHz for a North American audience. Programmes were in English, German, French, Italian and Gaelic.

American Forces Radio

The American Forces Radio and TV Service, AFRTS, was noted in early March on a short wave feeder, noted around midnight UTC on 6.7395 u.s.b. Some reporters suggested that the signal originated in Puerto Rico.

Whether this corresponded with an increase in activity in the Caribbean following the shooting

down of two US-owned planes searching for Cuban boat people between the island state and Florida, can only be guessed at.

If you want to tune in to the Cuban side of the story, English is beamed to Europe at: 2100-2200 on 9.550 and 2200-2300 on 6.180 and 9.505MHz.

Schedules

Monitor Radio International's schedule until the end of September shows English for Europe at: 0400-1000 on 7.535; 0800-1000 on 15.665; 1600-1800 on 11.55; 1800-2000 on 13.77; 1800-2100 on 15.665 and 2100-2400 on 13.77MHz

Following tests, **WWCR** has put its fourth short wave transmitter into operation. The station's schedule for the new transmitter in the summer period is 1100-2300 on 9.475 and 2300-1100 on 7.435MHz. The **WWCR** station is also on the air using its other three transmitters as follows:

WWCR-1 at: 0000-0900(C) 3315; 0900-1100(C) 7435; 1100-2100(C) 15685; and 2100-2400(C) 9475MHz.
WWCR-2 at: 0000-1400(C) 5935 and 1400-2400(C) 13845MHz.
WWCR-3 at: 1200-1500(C) 7435; 1500-2300(C) 12160 and 2300-1200(C) 5065MHz.

Georgian Radio has issued a programme schedule that lists several English language programmes. Try: 0630-0700, 0830-0900 and 0930-1000 on 11.91; 1600-1630 on 6.23 and 1830-1900 and 1930-2000 on 6.08MHz.

If anyone manages to confirm reception of Georgian Radio, please drop me a line c/o the *PW* Editorial Offices.

Radio New Zealand International (RNZI) has sent me its latest programme schedule, but it contains the rider that reception this far north is likely to be only marginal during our summer.

Nevertheless, if you like a challenge, here are the frequencies to try: 0458-0716 on 9.57 (continues to 0758 at weekends); 0716-1206 on 6.10; 1650-1950 on 6.145 (weekdays); 1950-2215 on 11.735; 2215-0106 on

15.115MHz

The RNZI station has altered its WWW home page address slightly. It can now be found at: <http://www.actrix.gen.nz/biz/rnzi>

Berlin News

There have been some strange goings-on in Berlin. First came news at the beginning of March that BBC World, the television news and information channel with global ambitions, has secured a terrestrial TV frequency in the German capital.

The news from Germany probably the first time that any country in the western world has invited another country's television on to its own domestic airwaves. Then it was reported that the **Voice of Russia** is being carried on 693kHz m.w. from a 5kW transmitter in Berlin!

English and German is apparently carried on the transmitter although the *1996 World Radio TV Handbook* suggests that this channel is used by *Jazz Radio Berlin*, and it has a 20kW transmitter. (More information as soon as it becomes available).

Challenge Accepted

I threw down a challenge to readers earlier in the year. Whoever sent me the first QSL card for the new English language programme from **Radio Denmark** would receive a small prize.

I have to say that the response was not overwhelming, but **Michael Beesley** of Romsey in Hampshire did send me a copy of his Radio Denmark QSL, so a gift will be on its way to you soon. Well done!

And that's all there is room for this month. Let me know of any interesting things you find while trawling the global broadcast bands, and I'll be happy to pass the word on to other readers. Good listening!

END

PACKET PANORAMA

Roger Cooke G3LDI begins his look at the packet world with a correction to a picture caption, then heads up north before settling down to look at books for your collection.

Before I begin the column proper, I must make a correction to my last column. There was a picture with a caption saying that it was the shack of Jack VE7FMY, with Dave VE7IM visiting. In fact, it was Dave's shack with Jack visiting!

Furthest North?

I had a long letter from John Eden GMOEXN, at Dunnet Head not far from John O'Groats. John has been active on most digital modes for some time and wonders if he is the most northerly active station? No doubt I'll receive some feedback if this isn't the case!

John runs a node DUN8HD with cross-band connections available. The set-up includes Kenwood gear for both h.f. and v.h.f. He runs KAM GOLD software and can operate the usual digital modes on h.f.

The antenna side of things at Dunnet Head are quite a challenge. At a site with wind speeds in excess of 85 knots on the cliff-top, antenna work is frequent!

John wisely employs another local amateur to work on his antennas, wise man! In Fig. 1, you can see John Robertson, with youth and a carefree attitude on his side, putting up the main h.f. antenna.

John is always happy to have h.f. digital contacts, but he also runs an inn and tea-rooms. So, if you are that way for a Sunday afternoon drive, or on holiday, I am sure he will be pleased to see you.

Packet Jargon

Many people may be discouraged from using packet, by the jargon used. Although it looks a complex side of the hobby, for the average user, nothing could be further from the truth. After a few evenings of reading, even the beginner can soon master the basic steps.

Several books have been written to help and two have just become available that I would thoroughly recommend. The first is the *Packet Radio Primer (PRP)*, by Dave Coomber G8UYZ, and Martyn Croft

G8NZU. Written and published first in 1991, it was small with 130 pages. It's now been re-written in a larger format, with twice as many pages.

Good paragraph headings make finding various topics easy. There are also cartoons from Paul Thompson G6MEN helping to give a light-hearted touch to what seems to be a complicated subject for many.

The basics are covered very well in the first few chapters of *PRP*, enabling even the raw beginner to assemble his station and get on the air. A complete chapter covers common parameters of TNCs. The timing parameters are most important and workable values are given in this chapter.

There is a section in *PRP* which contains information on Nodes and the Network, another grey area for beginners, with sample commands and responses shown. Additionally there's a short description of Demand-Assigned Multiple Access (DAMA). This is a node system designed to reduce collisions.

The Baycom packet system is described, from the singular modem to the four-port special PC card that allows multi-speed modes, all at the same time. Other high-speed modems are discussed, leading automatically to the next chapter devoted to Satellite packet operation.

The second half of the book is a very useful compendium of appendices, ranging from TNC commands and BBS descriptions, through to cable and port wiring diagrams. There's also a very brief description of TCP/IP working.

Packet radio Primer provides an overview of PC-based packet software, protocols, a glossary of terms, and some operating guidelines, makes this a very useful section.

The book finishes with a listing of BBS and nodes for the UK and a CLIVE information file.

I wonder why the Norfolk 144MHz repeater node was left out of the listing? However, a great deal of hard work has gone into the book, with lots of useful information for the beginner and anyone already active on packet.

Fig. 1: John Robertson showing willing by shinning up the pole to work on the antenna at GMOEXN's site at Dunnet Head.



Keeping up-to-date is difficult as I've found with my own *BBS Survival Guide*. Often, a complete re-write is necessary every few years, due to the rapid change in the data communications.

Second Book

The second book is *Practical Guide to Packet Operation in the UK* by Mike Mansfield G6AWD. This book has been kept in the same binder format as the previous version, but has been much updated.

Chapters deal with the basics, setting up a station and so on, with a trouble-shooting section, to help the beginner. There's even a section with connections for commonly used radios. For the more experienced operator, there's a section devoted to Packet Satellite operation.

Other modes such as AMTOR, PACTOR and Clover are also covered (the first time I've seen anything written about Clover). Several pages of h.f. AMTOR and PACTOR Gateways are given. Looking at this list, it makes one wonder how we manage to communicate on h.f. at all with the number of active stations!

A section aimed at the beginner follows, with descriptions of how to obtain files, use a PMS, the DX-

Cluster and even a Chat Node and a Weather Node are included here. There's a large section of help-files from various BBS operating systems. Then follows a similar appendix of a BBS stations, HR addresses and a listing of world-wide h.f. BBS.

Once again, I wonder if Mike reads this column at all, as I see yet again GB7LDI (the first h.f. BBS in the UK and active for the last 11 years) is not listed! The list includes about 12 pages to a North American listing, including Canada.

I would say that both these books are a valued addition for the bookshelf, despite two Norfolk omissions, hopefully this will be put right in the next re-write of both books!

Again space eludes me. Messages for me as: packet G3LDI @ GB7LDI, or 'snailmail' Roger Cooke The Old Nursery, The Drift, Swardston, Norwich NR14 8LQ.

END

BARGAIN

b a s e m e n t

Compiled by Zoë Shortland

Free adverts? Yes it's true! As of now, (with effect from the June 1996 issue) all adverts will be FREE of charge, to readers and subscribers.

Now's your chance to send in a photograph of your equipment (a good idea if it's really unusual) to accompany your advert. Please note that **all photos** will only be published at our discretion and are non-returnable.

When sending in your advert, please write clearly in **BLOCK CAPITALS** up to a maximum of 30 words, plus state your contact details. Please use the order form, which is published every other month. In the months between, a photocopy of the order form (with corner flash), or your advert written on a postcard (with corner flash) will be accepted - no corner flash - no advert!

Adverts are published on a first come, first served basis. All queries to Zoë on (01202) 659910.

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condition with new front
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Relay ? 12V v.h.f./u.h.f.,
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Yaesu FT-757GX h.f. transceiver. FT-757AT automatic tuner and MD1 microphone. Also **Yaesu FT-208R 2m** (144MHz) hand-held transceiver, little used, all boxed and manuals, £550. Tel: Didcot (01235) 813426.

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100W h.f. transceiver, c/w h/mic., manual and m/mount. **Yaesu FP-707** HD p.s.u./speaker, £725 o.n.o. **Icom IC-575H** 6/10m 100W transceiver, c/w h/mic., manual and external speaker, £495 o.n.o. Tel: Norfolk (01493) 853089.

Yaesu FT-ONE general coverage all mode solid state transceiver, memory board, extra filters. **Yaesu MH-1** mic., with up/down buttons, owners and service manuals, excellent condition, £750. G3RDG, NW London. Tel: 0181-455 8831 anytime.

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WANTED

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You should state clearly in your advert whether the equipment is professionally built, home-brewed or modified.

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Practical Wireless, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. We will always try to help readers having difficulties with *Practical Wireless* projects, but please note the following simple rules:

- 1: We cannot deal with technical queries over the telephone.
- 2: We cannot give advice on

- 3: All letters asking for advice must be accompanied by a stamped self-addressed envelope (or envelope plus IRCs for overseas readers).
- 4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
- 5: Only one problem per letter please.

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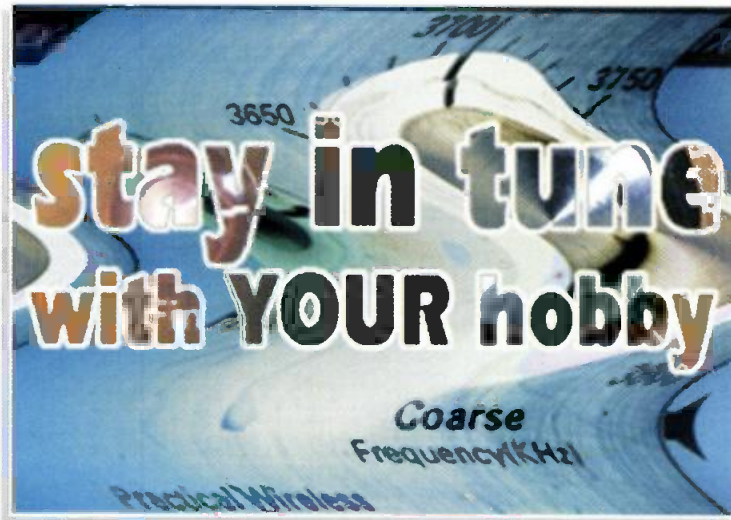
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Practical Wireless - THE VITAL COMPONENT!

FEATURES!

The 1996 QRP contest rules

The facts behind Aurora

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The Yaesu FT-3000M mobile transceiver

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Left/right movements of the joystick allow pitch bend. And the CDJ2600 is as tough as it is talented.

The robust twin transport has been designed to survive life on

the road, while damped mechanisms offer a very high degree of mechanical isolation, to maximise playability in any conditions. High quality sound reproduction is ensured by 16 bit, 8x over-sampling DAC technology, and ease of set-up is guaranteed by the unit's intelligent design.

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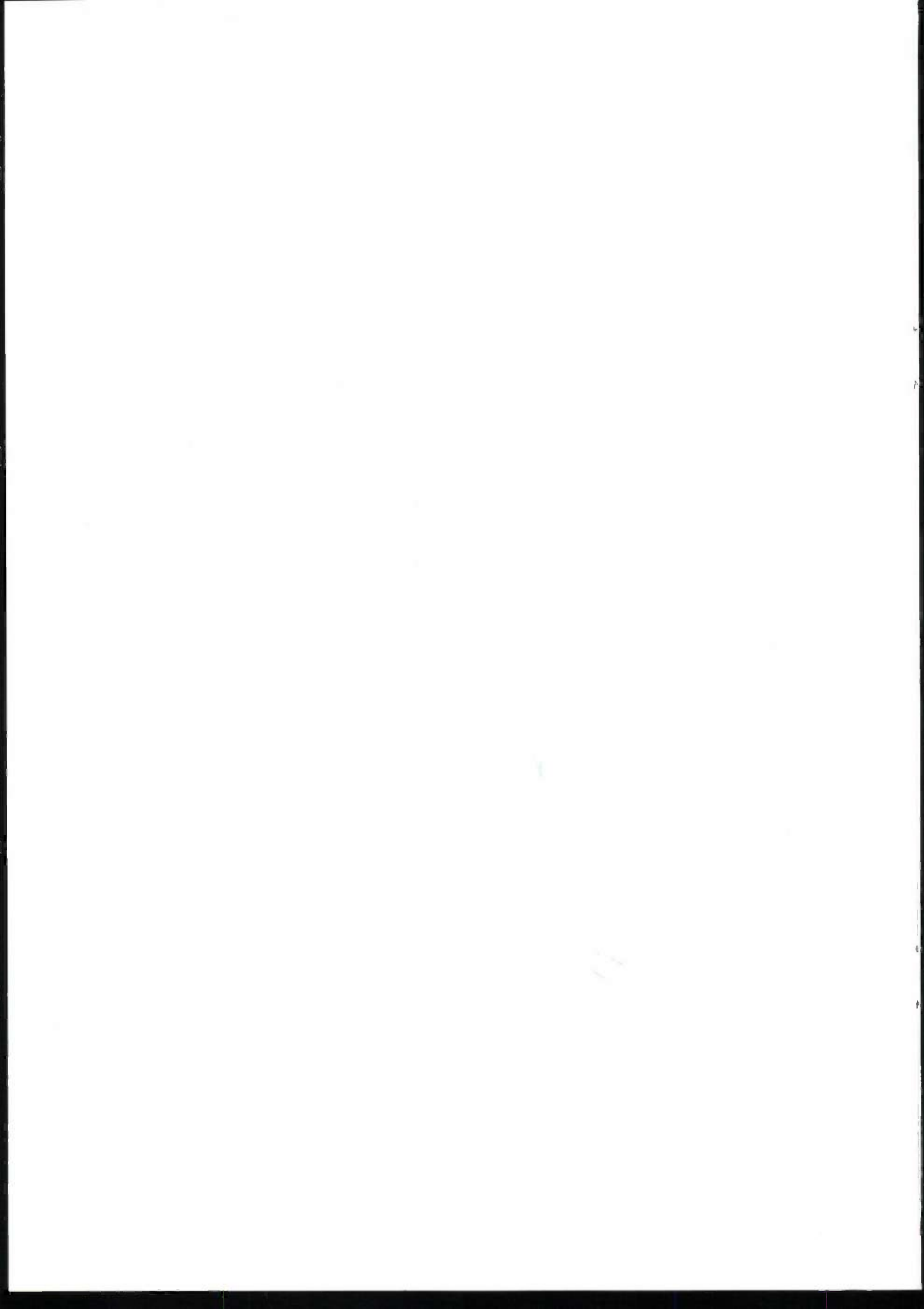
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The data on this chart was prepared for *Practical Wireless* by John Heys G3BDQ, regular contributor to 'Antenna Workshop' and author of the books *Practical Wire Antennas* and *Practical Antennas For Novices*.

The Practical Wireless Antenna Reference

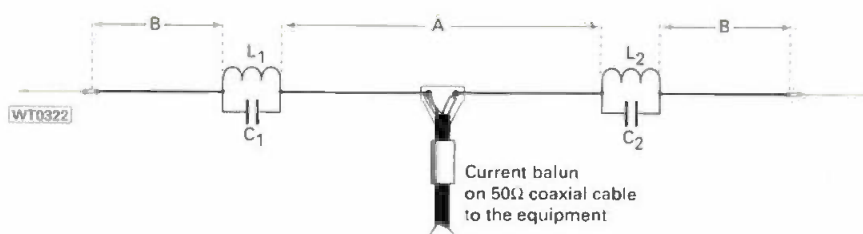
Trapped Dipoles

The 20pF, 25pF and 50pF capacitors must be rated at 3Kv and can be made from short lengths of UR-67 coaxial cable. This is good for 4000V. 'Grid dip' the traps before connecting them to the antenna using a g.d.o. and digital frequency meter or the station receiver. Protect coils and capacitor ends with silicone rubber sealant. Wire gauge shown is in millimetres diameter.

Bands covered	Length 'A' (metres)	Length 'B' (metres)	Coils L1 & L2			C1 & C2 (pF)	Resonance of trap (MHz)
			Turns / gauge	Dia	Len		
14 & 21	6.73	1.10	14.5 / 2.03	25	50	20	20.85
7, 14, 21, 28	10.19	3.20	9 / 2.03	65	40	25	14.00
3.8, 7, 14	19.55	6.70	15 / 2.03	65	65	50	7.00
1.8 & 3.5	40.10	15.37	8 / 4.1	50	25	500	3.50

WT0323

Protect coils and capacitor ends with silicone rubber sealant. Wire gauge shown is in millimetres diameter.



Half-Wave Dipoles

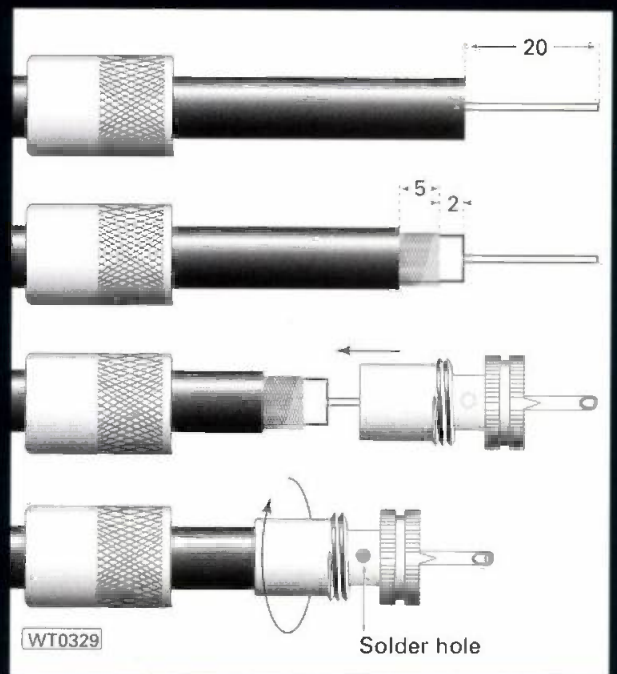
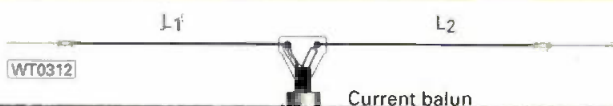
The use of a current balun just below the feedpoint is recommended but is not essential.

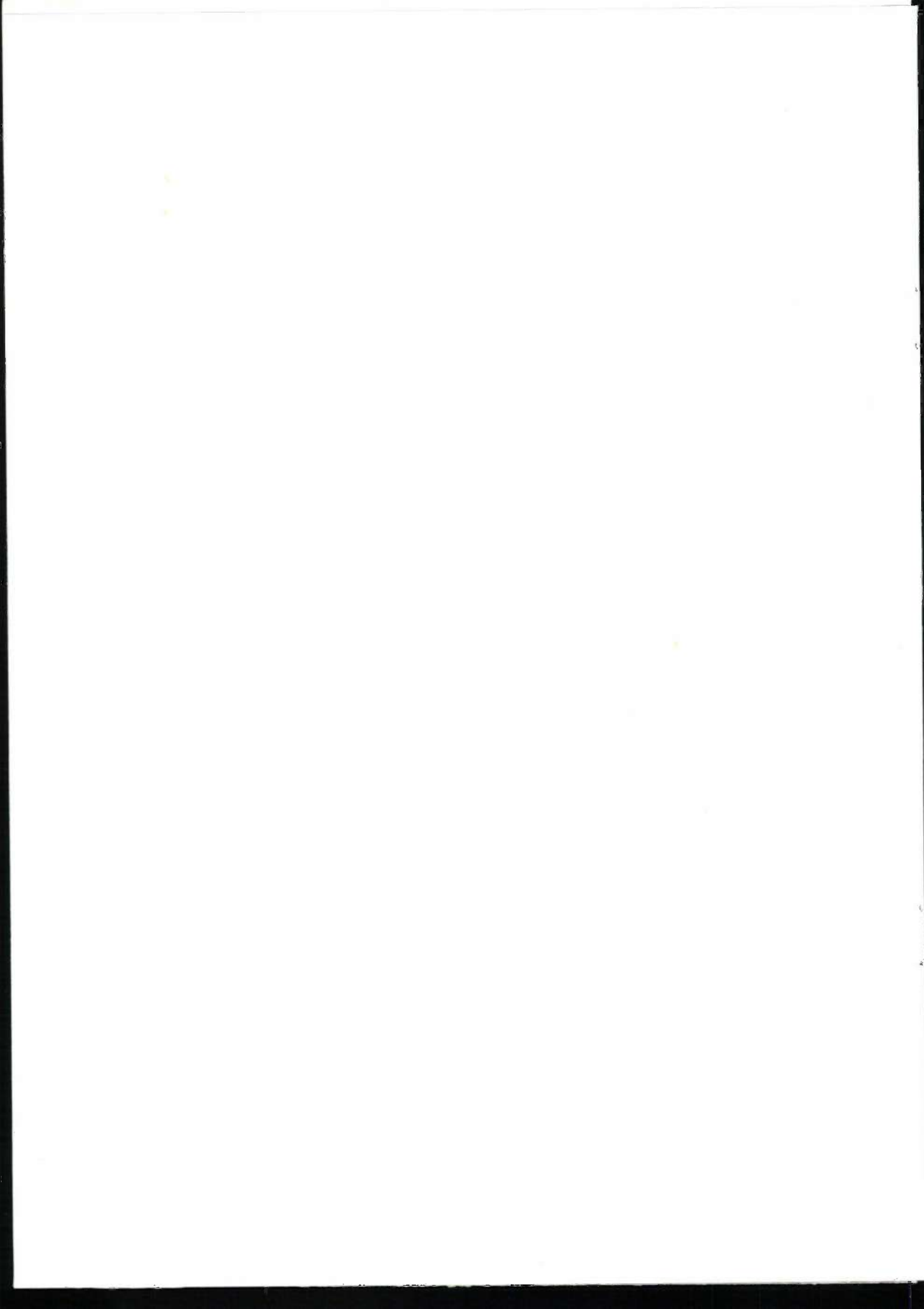
Half-Wave Dipoles			
Frequency (MHz)	Total length (L1 + L2)	Frequency (MHz)	Total length (L1 + L2)
1.850	77.29m	50.100	2.85m
1.950	73.33m	51.000	2.80m
3.550	40.28m	70.250	2.03m
3.750	38.13m	144.500	0.989m
7.050	20.28m	145.000	0.986m
10.100	14.15m	431.000	0.331m
14.100	10.14m	435.000	0.328m
14.250	10.03m		
18.100	7.9m		
21.100	6.77m		
21.300	6.71m		
24.940	5.73m		
28.100	5.08m		
28.500	5.01m		
29.000	4.93m		
29.500	4.84m		

To find overall dipole length.
With end insulators use:
$$L_1 + L_2 = \frac{143}{F(\text{MHz})}$$

Without insulators use:
$$L_1 + L_2 = \frac{145.7}{F(\text{MHz})}$$

WT0313

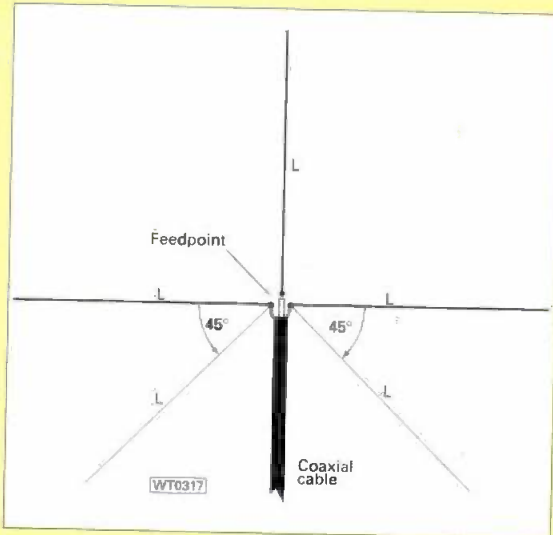




on 50Ω coaxial cable
to the equipment

Quarter-Wave Ground Planes

The vertical radiator (L) and the radials (L) should be positioned as high above the ground as possible. Their lengths are a quarter-wave and each is the same size as one leg of a dipole cut for the same frequency. The vertical radiator connects to the inner conductor of the coaxial



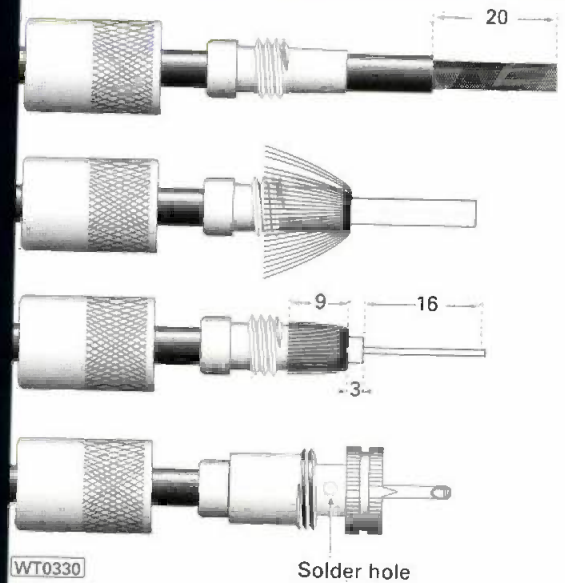
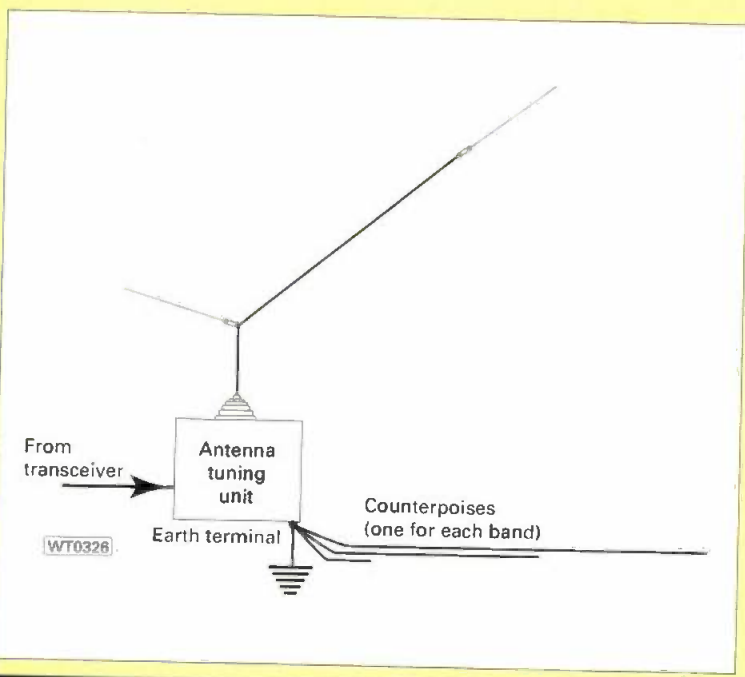
feeder and the ground planes connect to the cable's copper braid.

The feed impedance will be about 35Ω when the radials (ground planes) are horizontal, but this increases to a more useful 50Ω when the radials slope down at an angle of 45°.

Long Wires

An end-fed wire antenna becomes a long wire when its total length is more than one wavelength at the operating frequency. It is the simplest of antennas and may be arranged to fit into available space. It can be horizontal, part horizontal, bent or sloping. If possible, any bends should be at an angle greater than 100° otherwise there will be some cancellation of the radiation.

An a.t.u. between the wire and the equipment is essential and there must be a quarter-wave long counterpoise for each waveband used. The counterpoise wires can be run indoors or be laid in inconspicuous positions outside. They must all connect to the earth terminal of the a.t.u. and will remove or reduce any r.f. feedback or transceiver instability that may be caused by r.f. voltages in the house or shack. Long wires are also likely to give rise to TVI problems, a matter to consider when contemplating their use in urban environments.



Doublets

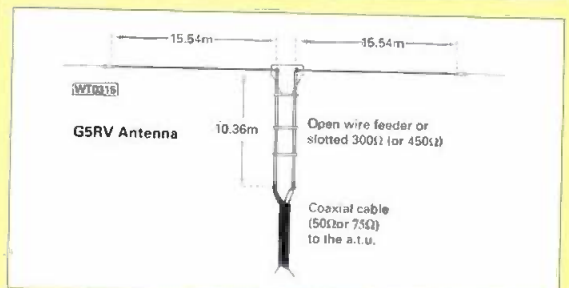
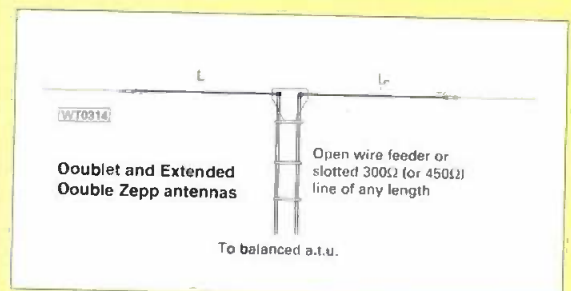
L and L are of equal length. The lowest effective frequency for a doublet is when its total length is more than a quarter wavelength at the operating frequency. A balanced a.t.u. must be used to match the feedline to the transceiver. Balance-to-unbalance 4:1 baluns are often used to connect balanced feedlines to an unbalanced 'single ended' a.t.u. This system is rarely effective on all the h.f. bands and when this is the case, balun heating and loss of power becomes serious.

Frequency (MHz)	Leg length (L)
7.000	26.0m
10.100	18.10m
14.200	12.64m
18.100	10.11m
21.200	8.53m
24.900	7.33m
28.500	6.4m

WT0318

The G5RV antenna is something of a compromise on several bands and must be used with an a.t.u. (unbalanced).

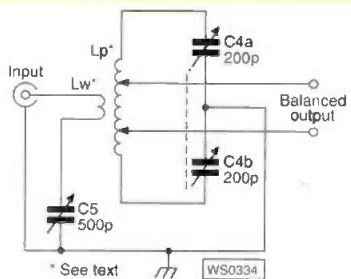
When each doublet leg is 0.64 of a wavelength long, the antenna then becomes an Extended Double Zepp. This has about 3dB gain over a half wave dipole. This gain is at right angles to the run of the doublet.



A Pi-network can be used with unbalanced antenna inputs.

$C1 = 350\text{pF}$ $C2 = 350\text{pF}$ $L = \text{approx. } 25\mu\text{H}$ (26 turns of 16s.w.g. on a 35mm diameter former spaced over 50mm and tapped every two turns).

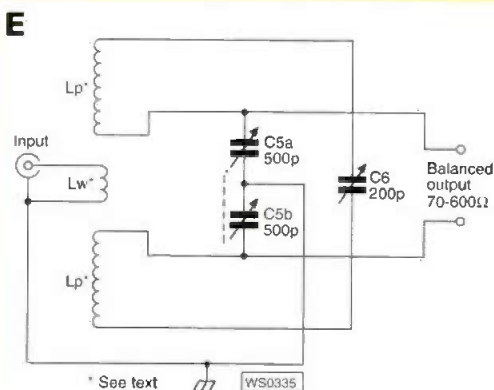
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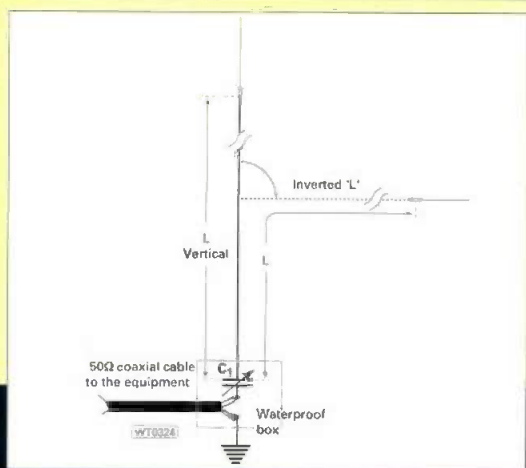
A simple a.t.u. for balanced antenna feeders. C4a and C4b are the same as suggested for circuit no. 3. C5 is a 500pF variable and LP is a plug-in coil. LW is a two turn link winding over the centre of LP.

A T-Match a.t.u. which does not have such a good low-pass function as the Pi-network but which is satisfactory when used with modern transceivers. L can be as in circuit no. 1 or instead can be 'roller coaster' variable inductor. C1 and C2 are both 350pF variables.

The SPC (series parallel) a.t.u. which has some degree of low-pass filtering. VL is a variable inductor with a maximum inductance of from 20 to 30μH. C3 is a 250pF variable and C4a and C4b are the sections of a split stator 200 + 200pF variable capacitor.



A sophisticated balanced output Pi-network a.t.u. which can match a wide range of antenna feeder impedances. LP and LW are plug-in coils and C5a and C5b are the sections of a 500 + 500pF split stator capacitor. C6 can be a 150 or 200pF variable capacitor.



The Extended Marconi

If a quarter-wave wire is lengthed to 0.28 wavelength a very good match to 50Ω feeder can be achieved by using a series capacitor at its lower end. The maximum r.f. current in a wire this long will be up above the feed point. This reduces absorption of radiation from any surrounding objects. The wire may slope, be vertical or arranged as an inverted 'L'. The minimum s.w.r. is found by adjusting C1. If it does not fall upon the desired frequency, the wire length can be increased or reduced by a few centimetres.

Practical Extended Marconi

Frequency (MHz)	'L' (metres)	C1 (pF approx)
1.85	41.15	500
1.95	40.96	500
3.55	22.49	300
3.75	21.29	300
7.05	11.32	150
10.10	7.89	110
14.20	5.62	75
18.10	4.42	60
21.20	3.77	50
24.90	3.20	45
28.50	2.80	35
29.50	2.70	30
50.10	1.58	25

WT0325

Delta & Quad Loops

Delta & quad loops are full wave antennas having a feed impedance of about 100Ω. To achieve a good match to 50Ω coaxial, a quarter wave matching section of 75Ω coaxial cable must be used as shown. The velocity factor of this matching coaxial cable must be considered when calculating its length.

The quad loops may be fed at the points marked 'X'. Delta loops may be fed at any of their corners, but the polarisation and angle of vertical radiation depend upon which corner is used. The points marked 'DX' provide low angle radiation for long distance working.

Those marked 'HX' give short range high angle radiation and the points marked 'MX' give radiation angles somewhere between the two. Deltas & Quads can be fed with balanced feed lines and then they can be used on higher multiples of their design frequency.

Delta or quad loop		
Frequency (MHz)	Total length (metres)	Length of 'M' (metres)
3.600	85.0	13.73
7.000	43.76	6.68
10.100	30.32	4.89
14.150	21.64	3.49
18.100	16.92	2.73
21.200	14.44	2.33
24.940	12.55	1.98
29.000	10.56	1.704

To find overall length of the quad or delta loop use:

$$\text{Length} = \frac{306.32}{F(\text{MHz})}$$

WT0321

