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LOW PROFILE ANTENNAS

SGC-239



reviewed

Kenwood

TS-50

A Modern Classic



SEPTEMBER 2001 £2.75



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Fax: 01702 205843



£799.95

Plus £8.00 Carr.

FT-817 is an incredible design feat by Yaesu, and world reviews agree that there has never been anything like it. It's not expensive either. So why not get out in the fresh air, or put one in the car, and put the fun back into your radio. Check out the exciting AT & ATX portable antennas on elsewhere on this page.

QAMP Single band 20 Watt Linear



Ideal for the FT-817 but only available as a kit. Models for 80m, 40m, 20m
£49.95 Case £13.95

OTT-1 One Touch Tune



Plugs into rear of FT-817 and gives immediate carrier for adjusting ATU or checking VSWR
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Z-11 Auto ATU for FT-817

160m - 10m **£199.95**

Kit **£169.95**



YAESU FT-1000MP Mk-V 200W HF All Mode Transceiver



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In choosing the FT-1000MP Mk V, you will be proud to own a rig with an impressive specification, reputation and lineage. Its outstanding performance and attention to detail, makes this the premier HF transceiver for the 21st Century. This radio is a class leader.

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19.4% APR: Deposit £299 and 36 months at £90.27.

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The FT-847 has firmly established itself as a true all-band, all-mode transceiver. Loved by the VHF & UHF operators, and superb for satellite operation, it also offers great HF performance. We have sold more than any other dealer, which says a lot about our reputation and our price. Phone for free leaflet today. And remember, our stock is genuine UK, not modified overseas models!!

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YAESU FT-1000MP AC 160 - 10m All Mode 19.4% APR Available



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ICOM IC-746 160m - 2m All-mode



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ICOM IC-766PRO 1.8 - 62MHz 100W



£1895

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You've read the rave reviews, and you have seen our recommendation on the web site. This radio with its amazing receiver and digital filtering, also includes auto ATU and real-time spectrum scope. A great DX rig.

19.4% APR: Deposit £229 and 36 months at £71.13.

YAESU FT-920AF HF 160m-8m-100w



£1099

Plus £8.00 Carr.

Includes full DSP and internal ATU. High tech receiver with dual tuning controls. Uses many of the FT1000 MP features but at a more attractive price. Full break-in on CW and includes a data port for TNC.

19.4% APR: Deposit £129 and 36 months at £35.02.

ICOM IC-775 DSP 200W HF Last of The Many



£2099

Plus £8.00 Carr.

ICOM IC-706IIE 160 - 70cm All Mode FREE Heil HS-706



£999

Plus £8.00 Carr.

Still a firm favourite with mobile operators and those who want a compact all-mode, all-band station. Phone for latest leaflet.

KENWOOD TS-670DE 160 - 10m All Mode



£849

Plus £8.00 Carr.

Probably the most underestimated transceiver on the market. Don't be fooled by the low price, the TS-570 has one of the best receivers around. One of the best buys if you want top HF performance on a budget.

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TS-870S HF all-mode **£1349**

KENWOOD TS-605 HF 100W



£599

Plus £8.00 Carr.

Kenwoods TS-605 has stood the test of time. 100W from 160m to 10m makes this a great value rig. Ideal for mobile or portable.

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£159

Plus £8.00 Carr.

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freephone orders: 08000 73 73 88

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TH-F7E

NEW

LOWE

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£199
Plus £6.00 Carr.

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£359.95

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Covers 1.6 - 30MHz and handles 3 - 200W. Designed for end-fed wires, just connect to 12V and feed with RF via coax. Can be mounted outside or at top of mast.

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SR-100	2m 4-25W in / 100W out	£169.95 B
SR-200	2m 10-50W in / 200W max out	£299.95 B
VUR-30	2m/70cms 1-5W in / 20/30W out	£199.95 B
RU-20	70cms 3-15W in / 20W max out	£119.95 B
RU-45	70cms 3-15W in / 45W max out	£165.95 B
RU-432-95	70cms 6-12W in / 95W max out	£499.95 C

WCN-3 Adaptor. For all transceivers using SMA connector. Converts to BNC £3.95 A

SPEAKER MICS.

Including Yaesu and Icom 4-way jack.
QS-112-Y Yaesu £16.95
QS-112-K Kenwood £16.95
QS-112-Y4 4-way £16.95
Phone if in doubt about suitable model.

HANDS-FREE MOBILE MICS.

£42.95

Plus £2.00 Carr.

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2 El. on:	20m, 15m 10m	
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F/B	10dB, 12dB, 22dB	
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Boom:	2.2m	
Element	5.2m	
Radius	2.7m	

A3-S 10-15-20m 8dB 2kW	£389.95 D
A-743 10/7MHz kit	£129.95 C
A4-S 10-15-20m 9dB 2kW	
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R-5000 6 - 20m vert.	£299.95 D
R8 6-40m vert 8.7m	£399.95 D
TEN-3 10m 3 el.	£159.95 D
D4 10-40m 10.92m 2kW	
D3 10 - 20m 7.86m 2kW	£259.95 D
rotary dipole	
D3 10 - 20m 7.86m 2kW	£189.95 D
rotary dipole	
XM240 40m 2 el	£569.95 D
XM520 5el 20m	£629.95 D
XM515 5 el 15m	£359.95 D
Phone for catalogue.	

MFJ-269 ANALYSER

160m - 70cm
On-site
Antenna
Analyser.

£299.95

Plus £8.00 Carr.

MFJ-259B 1.8 - 170MHz

Imagine being able to plug into your antenna or feed line and make meaningful adjustments on site. Or be creative and turn hours into minutes and ideas into antennas! Read what RadCom says and make your own mind up. One of the best investments you will ever make!

HEIL AUDIO

Appointed by Heil as UK Distributor

Proset-4	H'phone/boom mic	£129.95
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Micro-4	Lightweight ver.	£99.95
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HM-10-5	Stick mic	£69.95
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HC-5	Spare insert	£32.95

You can convert your mic to Heil by simply purchasing HC-4 or HC-5 insert.

HEIL HS-706

NEW



This new mobile/base headset from Heil is a winner! With single earpiece, head-telephone and amplified boom microphone, you get the Heil quality and true hands-free convenience (using VOX). Just plug into mic socket, no other connection or accessory needed. Bags of audio, even on older models. PTT switch included. We were amazed at the quality, price and ease of use!

AVAIR AV-600

£59.95

Plus £8.00 Carr.

1.8 - 525MHz VSWR Meter 5/20/200W scales. Dual sensors, PEP reading. More accurate than built-in meters.

THE TOUGHEST JAPANESE ROTATORS

These are tough rotators that weigh almost twice as much as similar priced units and have great turning capacity. Made by Create of Japan, they will handle 4 element HF yagis with ease. Our own Create model has been on our roof for 12 years turning a 4-element HF beam. We wouldn't use anything else!



RC5-1 Standard control box, OK for 4-el Yagis - needs 7-core cable **£349.95C**

RC5-3 Control box features pre-set or manual control. Otherwise the same as RC5-1 above **£449.95 C**

MC-2 Lower mast clamps **£49.95 B**

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Hunter	HF 1 x 3-500ZG 750W out	£1195 C
Hunter	6m 1 x 3-500ZG 800W out	£895 C
Ranger	HF 4 x 811A 800W out	£895 C
Discovery	2m 1 3CX800 400 - 1KW out	£1395 C

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Hitachi H4-W51

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Plus £8.00 Carr.



Sony WS-1000

£149.95

Plus £8.00 Carr.



CAROLINA WINDOMS

CW-80 Special

Just 66ft long yet covers 80m - 10m. It will outperform a G5RV and give lower angle of radiation because of the 10ft vertical section which is forced to radiate. It will handle 1.5kW

Carolina Windom 80 Special



£89.95

Plus £8.00 Carr.

Other Models (all with low angle radiator stub)

CW-160	160 - 10m 171ft long	£109.95
CWS-160	160 - 10m 133ft long	£99.95
CW-80	80 - 10m 133ft long	£84.95
CW-40	40 - 10m 66ft long	£79.95
CW-20	20 - 10m 34ft long	£77.95

80-40-20M MINI DIPOLE

The "80 plus 2" Mini - Dipole was designed by our Director, Peter Waters, G3OJV. Just 52ft long, it uses linear loading - no tuned traps. It can be directly fed without ATU and also operates at 2.5:1 VSWR on 15m. Amazingly efficient, it handles 400 Watts and is balun fed. Erect it as an inverted V and it takes up less than 40ft of space. If you have a small garden, don't miss out on the LF bands anymore. £79.95 Carr. £6.00

POWER SUPPLIES



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23 Amps - 3.2lbs!

Back In Stock

Beware of cheap noisy supplies that have poor filtering & construction!

Lighter than an IC-706 and about the same size! The SEC-1223 switch mode power supply delivers 23 Amps at 13.8V Thermo fan cooled, it measures just 57 x 177 x 190mm. Will power all 100W rigs and can be changed for 115V AC

WATSON



£89.95

Plus £8.00 Carr.

Watson power supplies guarantee the very best performance and value for money. Tried and tested, they have been submitted for independent laboratory testing for safety and electrical performance.

W-3A	3 Amp fixed supply.	£22.95 B
W-5A	5 Amp fixed supply	£29.95 B
W-10A	10 Amp variable supply	£59.95 C
W-25A	25 Amp variable supply	£89.95 C
W-30A	30 Amp variable supply	£119.95 C

COMPACT 10 AMP SWITCH MODE PSU

The W-10SM is small enough to fit in a brief case. Measuring just 230 x 100 x 65mm, it's ideal for 50 Watt mobile's etc. Over voltage and current protection.



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Cover Subject

The British Telecom International Criggion Radio transmitter is situated within the triangle formed by the towns of Shrewsbury, Oswestry and Welshpool and is somewhat unusual in the fact that it takes its antenna wire anchorage from a Welsh mountainside.

Although the Kenwood TS-50S has been around for a good few years it is still a popular choice among Amateurs. So much so that we got GORSN to take it on a caravanning trip to test its performance.

Main photograph by: **David Williams**

Inset photograph by: **Tex Swann G1TEX**

Design by: **Steve Hunt**

September features

16 Radio Basics

Following on from last month **Rob Mannion G3XFD** continues explaining his clock project, designed to help you monitor the International Beacon Project. Keen to have a go? - Well don't delay find out how by reading RB today!

18 RAE Courses Listing

Thinking about taking your Radio Amateur's Examination? Well don't just think about it - do it! Check out our list for courses in your area and find out who to contact if you can't find one.

22 Looking At....

Gordon King G4VfV presents the second part of his look at audio stages.

23 Out of Sight - Out of Mind?

Putting up antennas can cause problems, in that your neighbours get upset at the thought of living next to an antenna farm. **Bill Brown G3NqX** shares some ideas for antennas with very little visual impact.

25 Craggy Criggion - Wartime Wizardry

Criggion is a unique radio transmitter as its antenna wires are anchored to the side of Welsh mountain! **Hari Williams** shares the fascinating history of the station.

32 Reviewed - The SG-239 Smartuner

The latest version of SGC's Smartuner is put through its paces by **Rob Mannion G3XFD** and he discovered that it has some significant advantages over its predecessor.

34 Practical Circuit Board Construction

Do you frown and puzzle over how you can make your own printed circuit boards without the need for chemicals? Take a look at **Ian Liston-Smith's** ideas to produce boards that look good and are chemical free.

38 Antenna Workshop

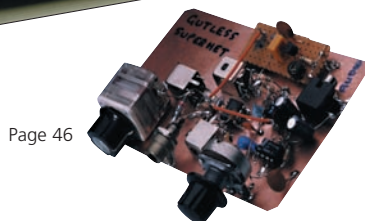
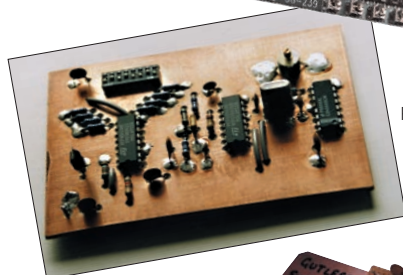
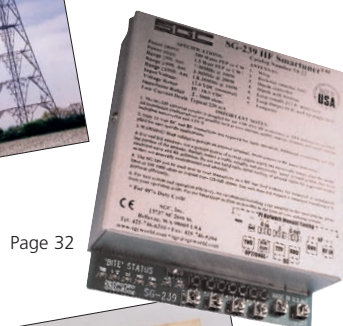
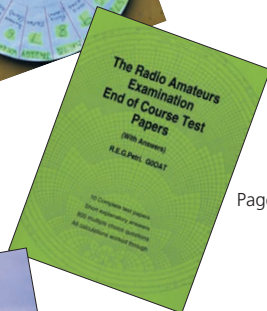
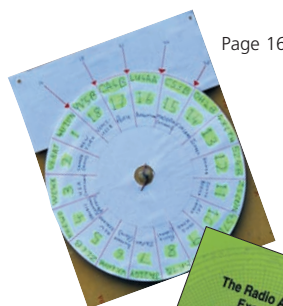
Joe Carr K4IPV may no longer be with us but his ideas live on. This time he 'discusses' the Inverted-L antenna for use on the low h.f. bands.

42 It's a Modern Classic!

Kenwood's TS-50S compact h.f. transceiver has quickly become a classic of its type. Still available and very much sought after, this rig oozes professionalism as summed up by reviewer **Richard Newton GORSN**. Read Richard's review to see why its still a very tempting buy.

46 Carrying On The Practical Way

Find out how to go from direct conversion to superhet in one easy lesson with **George Dobbs G3RJV** this month.



- 9 Rob Mannion's Keylines**
Rob G3XFD introduces another cram packed issue with comments and news.
 - 10 Amateur Radio Waves**
Readers make 'waves' by writing in with their comments, ideas and opinions.
 - 11 Amateur Radio Rallies**
A round-up of radio rallies taking place in the coming month.
 - 12 Amateur Radio News & Clubs**
Find out what's hot in the world of Amateur Radio, this month there's news of new distributor appointments and a very special initiative designed to introduce the heritage of communications to all. Don't forget to check out what activities your local club has planned too.
 - 48 Valve & Vintage**
The current hungry PM2DX valve is the topic of much discussion as **Phil Cadman G4JCP** takes his turn in *PW's* very own vintage wireless 'shop' this month.
 - 50 VHF DXer**
The bands are alive! **David Butler G4ASR** reports on contacts with all continents on the 50MHz band thanks to your logs and feedback.
 - 52 HF Highlights**
Carl Mason GWOVSW reports on the recent happenings on the h.f. bands with the help of your logs and reports.
 - 55 Keyboard Comms**
Roger Cooke G3LDI asks the question is the packet network doomed as well as geiving details of some radio related websites for you to check out.
 - 58 Down Under**
A report on the Dayton Show and **Chris Edmondson VK3CE's** visit to the *PW* offices form the basis of the column this time.
 - 61 Tune In**
Tom Walters has all the latest h.f. broadcast schedules and news.
 - 62 Bargain Basement**
The bargains just keep on coming! Looking for a specific piece of kit? - Check out our readers' ads, you never know what you may find!
 - 64 Book Store**
The biggest and best selection of radio related books anywhere!
 - 69 Topical Talk**
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Our Radio Scene reporters' contact details in one easy reference point.

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rob mannon's **keylines**

Welcome to 'Keylines'! Each month Rob introduces topics of interest and comments on current news.

As I write this edition of 'Keylines' the memory of the superb weather we enjoyed at the Longleat Rally in late June is fading. However, much to my surprise (bearing in mind just how hot it was on Sunday 24 June) I've just seen some photographs I took on the day and was astounded to see **that there was one cloud above** the show ground! The tiny white puff of cloud seemed to watch over us all day as it seems to have appeared in all my photographs. What a delightful day it was!

Although I was sat at one end of the PW Publishing rally stand - the official staff members working there were **PW News & Production Editor Donna Vincent G7TZB** and **Peter Eldrett** - PW Publishing's very own Falconry enthusiast (and moustachioed wit!) from the Advertising Department. They very kindly allowed me to park my seat there to chat to readers!

Whilst perched on my stool - borrowed from my new workshop at home - I had the opportunity to meet one extremely honest reader who came to thank me face-to-face for complying with his request (and of other readers) not to appear photographically in *PW* very often. I understood his frank comments on my previous photographic over-exposure and he was pleased when I said my future appearance would be strictly limited to the Keylines pages and then only rarely! I hope he left assured that leading a magazine production team is certainly not an ego trip on my behalf!

Who's The Editor?

Strangely enough, not long after I'd had the opportunity of meeting the frankly spoken reader - I arrived back at the *PW* stand after looking round the rally to a surprise. I was met by comments from Donna along the lines of "We've had questions asking 'where you've got to on your Keylines pages lately?' from readers!"

It appears that a number of readers had approached Donna G7TZB to ask for my photograph to feature on the Keylines page so that they know what I look like if they attend the major shows/rallies. One reader - fairly new to the hobby - said he only knew what I looked like after seeing a news story in **Echo Ireland**, the **Irish Radio Transmitters' Society** Newsletter before making the rally part of his holiday from his home in Limerick.

So, the point was made...**OCCASIONAL** photographic appearances of yours truly do serve a purpose and help new readers. I'll be pleased to comply (and with help of the digital technology in the Art Dept. We'll even make me look thinner and perhaps grow a replacement arm and better legs too?).

New Workshop

The latest photocall also gives me the opportunity to share views of my new workshop, from which several new ideas have already come for use in *PW* - especially Radio Basics.



The first view shows yours truly, having set the camera's self-timer, sitting in the doorway of the workshop, with the door being held open by the extremely versatile *PW* 'Tenna-Tourer portable mast base doubling up as an extremely effective door-stop!

Basically, the workshop is an 8 x 6ft (it's sold in imperial measurements) modified summerhouse design. The door was made wider because of my size and the height of the entire building is increased by a foot because of my own height. I chose the front (right-hand opening) opening door so that during hot weather - **always the bane of portable buildings** - almost half of the front 'opens up' so that it can be both cool and well ventilated. The exceptionally high bench (built to combat my back problems) runs from the doorway to the end of the building, under the window.

The second photograph shows an inside view of the workshop. Rather than to illustrate the equipment, it's to show that everything's within my reach. However, the most important aspect seen is the panelling which covers the insulation.



The basic pinewood tongue & grooved building cost £600 including delivery and erection. However, for another £200 the walls have been insulated with a layer of two inch thick industrial grade wall-insulation polystyrene foam.

The floor insulation on the other hand (or foot perhaps?) is nearly four inches thick. And this is carpeted with cheap B&Q carpet tiles which are easy to replace, remove for cleaning, etc. All rather extravagant you might think...but even in February when the building was ready for use it was kept comfortably warm by a solitary 150W light bulb. And during our brief hot spells it's been very cool when the door has been opened.

Extra ventilation has been provided by a fan removed from a life-expired microwave oven! This draws air in through the one opening window. A wireless intruder alarm system kit cost less than £50 and this is powered by a £6 solar panel.

Altogether I'm very happy indeed and whenever I move home, it's all designed to move relatively easily with me. It's proved to be wonderfully therapeutic having my own workshop again!

Rob G3XFD

practical wireless **services**

Just some of the services *Practical Wireless* offers to readers...

Subscriptions

Subscriptions are available at £28 per annum to UK addresses, £35 in Europe and £38 (Airsaver), £45 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Practical Wireless* and *Short Wave Magazine* are available at £55 (UK) £68 (Europe) and £74 (rest of world), £85 (airmail).

Components For PW Projects

In general all components used in constructing *PW* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *PW* projects are available from the *PW* PCB Service, **Kanga Products, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of *PW*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *PW* are £2.50 each and photocopies are £2.50 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for *PW/SWM* is also available from the Editorial Offices for £1 inc P&P.

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Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone (01202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone (01202) 659950.

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Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *PW*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

Make your own 'waves' by writing into *PW* with your comments, ideas, opinions and general 'feedback'.

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.



Puzzling Comments On Air

Dear Sir

While the vast number of QSOs on the Amateur Bands are both interesting and stimulating, I never cease to be puzzled by hearing the following:

- * The XYL does not approve of my hobby.
- * Subject to the XYL's approval.
- * My XYL would not permit.
- * My XYL will not allow me to have a rig in the car.
- * I can only go on the air when the XYL is out.
- * My shack is in the shed as my XYL would not allow me to have it in the house.
- * I'll have to ask the XYL – this normally is before deciding to attend a radio convention/event.
- * My XYL will not let me put up a decent antenna.
- * **AND EVEN:** I must consult the boss!

I normally take my equipment on holiday especially when going abroad and have a couple of sessions on the air lasting an hour or so each day. I never cease to be amazed about the number of UK Amateurs I work who say "I'd love to take my rig on holiday but my XYL would not permit me" and "You must have a very understanding XYL".

What's wrong with these guys and, more to the point, what wrong with their partners? Why do the partners resent the hobby? Amateur Radio is a most wonderful pastime. These XYLS should consider themselves fortunate to be associated with a Radio Amateur as my wife June does.

We have both met and made lifelong friends with many super people in all walks of life from many parts of the globe. June agrees with me that it's difficult to imagine life without Amateur Radio.

However, these negative thinking partners must be in the minority. It's a shame that the hobby does not attract more females. Is there anything we can do constructively to remedy the situation?

Jack Drake GM4MOX
Fife

Editor: Some interesting points Jack, and I feel sure we'll hear some other opinions on the matter very soon indeed! And if you're ever listening to 80m during the 'wee small hours' I've no doubt that one of the 'chat gangs' who inhabit the frequencies between 3.7 and 3.760MHz each morning - between midnight and cockcrow - will discuss the topic! Most of these (seemingly anonymous as I never hear callsigns given) Amateurs have apparently adopted night-shift operations for similar reasons to those Jack has highlighted!

Passing My Morse Test

Dear Sir

You may remember that I rang your office a few weeks ago about the problems I was experiencing arranging a 5w.p.m. Morse test. Thanks you for your offer of assistance, but fortunately a helpful lady (Catherine) at the RSGB was able to get me a test at the Somerset centre. This I have now sat and am reasonably confident that soon I shall be on h.f. as an M5.

The Somerset team were very 'professional' Amateurs and really made me feel at ease, which is pleasing to report following my experience with the Devon team. Surely I am not alone in the struggle to get a test? Cornwall have no scheduled tests for 2001 at all and Devon have had one in March I believe and now only will be testing at Torbay in August.

The Radiocommunications Agency (RA) inform me that RSGB should be testing in every county on a quarterly basis, what

do you think about that? The Amateurs that kindly taught me - **MOBHK** and **G3RYZ** - put in a lot of effort and give back to the hobby in true Amateur spirit, what a shame that the testing service does not follow suit, another reason perhaps for the decline in our hobby?

I passed your regards to our mutual friend **Angus G3TXL** who also gave me a bit of Morse practice. Regards also to all at *PW* and keep up the good work.
Dave Parker M1BVU
Cornwall

Editor's comment: I look forward to working you as an **M5 Dave**. I've had much pleasure in working **M5s** recently and it's my opinion that they are breathing new life into the h.f. bands. As regards the RSGB Morse testing service - we've got to remember it is a system run by volunteers. However, it would no doubt prove very interesting indeed if we can get some feedback from

those involved in the system on your side of the River Tamar. Let's hope we do!

Corner Flash Problems...Again!

Dear Sir

I have just read/browsed through the June & July issue's of *PW*. I have never taken the magazine on a regular basis, but I will be from now on. I like it...a great deal!

However I do have one big criticism. Though you run some brilliant competitions and prize draws, I like to be able to keep all of the different types of magazines that I buy intact. And although I like your concept about being able to photocopy the relevant page, and cut the 'Corner Flash' from the page...it is often on a page that has editorial or some sort on the other side of the page that I would wish to keep.

For example. I especially like your technical pages. In the June issue this year the SGC-237 Automatic Antenna Tuner

competition was on the reverse side of **Tex's Tips & Topics**. This meant that to enter the competition I would have lost some of the editorial at bottom of Tex's Topics even if I had used the option to photocopy an entry.

However, I saw the competition page for the July issue too. That really was brilliantly placed as it was on the reverse side on a page of adverts. I would have sent the complete original page for that one!

My point is this: could you please put all the competitions on pages that only have advertisements on the reverse side of the same page please? I am sure that I am not the first, nor will I be the last to mention or request this.

In my case I was unlucky enough to get both copies of the magazine (purchased together) too late to enter the contests.

Ray M5ADB
Kent

Editor's comment: Everyone on the Editorial team are delighted you're enjoying *PW* so much Ray. However, regarding the awkward placement of 'proof of purchase' corner flashes, as you say, you're not the first to raise the subject! But please be assured that we try to avoid placing them against editorial text wherever possible and are alert to the annoyance caused when this proves difficult. We'll always try to avoid it you can be sure!

Standing Orders & Final Notices

Dear Sir

Just out of interest, I have been paying my licence fee by standing order for over five years now, and every year I get a reminder, then a 14 day notice, then a final notice, then I get the validation document. For the RA to blame this on recent postal strikes is a bit off, considering it is their normal performance!

Rob Jarvis G8UBU/OH8GAD
Colchester

Editor's comment: You're not alone Rob! Several *PW* staff who

pay their licence fees in this way have had the same problem. I've contacted the Radio Licensing Centre in Bristol and we hope to have some comments from them to publish in the next issue of *PW*.

Henry Round & Light Emitting Crystals

● Dear Sir

I was intrigued by the Rev. George Dobbs' reference - in his August **Carrying On The Practical Way** column - to an American experimenter **Henry J. Round** who discovered that crystals could emit light. Was this the same H. J. Round who met Marconi in 1903 and worked for him from 1908 for many years?

If so, he was English and pioneered the development of valves by introducing the famous Round soft valve. This was kept working properly by applying a lighted match to the glass tip which contained a piece of asbestos whose outgassing restored sensitivity by adjusting the vacuum. Capt. Round also designed the miniature Q and V24 Marconi tubular valves which were widely used in shipboard sets and were still made as spares until 1937. He also invented the grid leak circuit. Did he invent the l.e.d. too?

Anthony Hopwood
Worcestershire

Moving Coil Meters

● Dear Sir

Reading the **Radio Basics** article about moving coil meters Page 22 July issue) I wish to bring to your attention the small 200µA meters often found in CB equipment, and also the larger type of meters found in the above equipment. When making radio frequency (r.f.) measurements they can be totally useless at the lower

frequencies (e.g. below 10MHz) but they seem to work well at 14MHz and above and are suitable for audio measuring equipment.

I wonder if any other home-brew readers have found this problem? If building a QRP power meter perhaps it's better to give these meters a miss and buy a quality moving coil meter.

J. Walter G0WMJ
Merseyside

Interesting Text

● Dear Sir

Having been an Amateur Radio operator now some 18 years I decided to tidy up my shack. I found the enclosed text and thought it applies to our times, judging from the conversations heard on the South London repeater!

"Go placidly amid the noise and haste & remember what peace there maybe in silence. As far as possible without surrender be on good terms with all persons. Speak your truth quietly and clearly; and listen to others, even the dull and ignorant; they too have their story.

Avoid loud and aggressive persons, they are vexations to the spirit. If you compare yourself with others you may become vain and bitter; for always there will be greater and lesser persons than yourself. Enjoy your achievements as well as your plans.

Keep interested in your own career, however humble, it is a real possession in the changing fortunes of time. Exercise caution in your business affairs; for the world is full of trickery. But let this not blind you to what virtue there is; many persons strive for high ideals; and everywhere life is full of heroism.

Be yourself. Especially, do not feign affection. Neither be cynical about love; for in the face of al aridity & disenchantment it is perennial as the grass.

Take kindly the counsel of the years, gracefully

surrendering the things of youth. Nurture strength of spirit to shield you in sudden misfortune. But do not distress yourself with imaginings. Many fears are born of fatigue & loneliness. Beyond a wholesome discipline be gentle with yourself.

You are a child of the universe, no less than the trees and the stars; you have a right to be here. And whether or not it is clear to you, no doubt the universe is unfolding as it should.

Therefore be at peace with God, whatever you conceive Him to be and whatever your labours & aspirations in the noisy confusion of life keep peace with your soul.

With all its sham, drudgery & broken dreams, it is still a beautiful world. Be careful. Strive to be happy".

I also found the enclosed photographs of h.f. beam antennas. They were taken by chance, by me from a train just outside Zurich, Switzerland. The impressive mast was not guyed but entered (at ground level) a structure that looked like a small bunker. Some mast!

I don't know if it belonged to an Amateur or a commercial station, but I'd sure like it in my back garden, but I'm not too sure the neighbours would like it! Even its shadow would be a bit strong! **Practical Wireless** is still a good read after all these years, long may it go on.

D. Barley
Croydon

Editor: Interesting quotation with much common sense! Unfortunately the photographs would not reproduce well enough for *PW*, but maybe another (Swiss perhaps?) reader will recognise the description and know of them? Although from the photographs they look more military than Amateur.

amateur radio rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations.

August 12

Flight Refuelling ARS Hamfest

Contact: Keith Elliott

Tel: (01202) 577937

This annual hamfest takes place at Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. The event will run from 1000 to 1700 hours and will include the usual mix of traders, Bring & Buy, crafts, car boot sale and field events. Overnight camping facilities will be available for Saturday 11th. Talk-in on S22.

August 19

The Leeds & District ARS Rally & Car Boot Sale

Contact: J. Mortimer M0JAM

Tel: (01943) 874650

This twice yearly traditional outdoor rally and car boot sale hosted by the Leeds & District ARS takes place today at the Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. There will be plenty of free parking for buyers.

August 26

Milton Keynes ARS Annual Radio Rally

Contact: Dave G3ZPA

Tel: (01908) 501310.

Now in its 15th year the Milton Keynes ARS annual radio rally at a new venue this year. The event will take place St. Paul's School, Phoenix Drive, Leadenhall, Milton Keynes, Bucks. Talk-in on S22 and SU22.

August 26

Torbay Amateur Radio Society's Mobile Rally

Contact: John Head G4VUD

Tel: (01626) 205514 (answerphone during office hours)

E-mail: rally@tars.org.uk

Why not go along to the Torbay ARS mobile rally? Taking place at Churston Grammar School, Greenway Road, Churston, Torbay, Devon there will be the usual mix of traders and stalls.

August 27

The Huntingdonshire Amateur Radio Rally

Contact: Peter Herbert M5ABN

Tel: (01480) 457347 (between 1800 and 2200)

This Bank Holiday Monday rally takes place at Ernulf Community School, St. Neots, Cambridgeshire (near to the Tesco Superstore on A428). Doors Open 1000-1400, admission is £1.50. Hot and cold refreshments available. Features include selling hall and car boot sale. Talk-in on S22.

September 15

The Waterside Radio & Computer Rally/Boot Sale

Contact: John Daw G0UUV/Malcolm Troy G0WFFQ

Tel: 0238-089 3541/0238-090 5226

E-mail: troy-enterprises@faxvia.net

The Waterside (New Forest) ARS will host their rally at the Applemore College, Roman Road, Dibden Purlieu. Doors open 1000. There will be two indoor halls, field traders and exhibits, car boot/flea market, on-demand Morse tests (remember to bring passport sized photos). Talk-in on 2m. Free parking.

September 16

Barry ARS Amateur Radio & Computer Show

Contact: Brian GWOPUP

Tel: 0292-083 2253

Why not go along and see the latest amateur equipment, from major manufacturers and suppliers at the Barry ARS Amateur Radio & Computer Show. There will also be fantastic working models of satellites, like *Phase 3D* and others. All this and a Bring & Buy. The event takes place at the Barry Memorial Hall, Gladstone Road, Barry, S. Wales.

September 21-22

The 30th Leicester Amateur Radio Show and Convention

Contact: Geoff G4AFJ

Tel: (01455) 823344

E-mail: g4afj@argonet.co.uk

Website: <http://www.lars.org.uk>

This annual event takes place at Castle Donington International Exhibition Centre, Donington Park, NW Leicestershire. Doors open 0930-1730. There will be 150 trade stands, a flea market, Bring & Buy, local and national clubs and societies. Morse tests on demand, demonstration Amateur Radio stations, camping and caravanning on-site. Talk-in on 145.550 and 433.550MHz. A one day ticket costs £3, concessions (OAPs and under 16s), £2.50, two day ticket, £5, concessions £4 - under 12s free when accompanied by an adult.

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.

Keep your letters coming to fill *PW*'s postbag

Letters Received Via E-mail

A great deal of correspondence intended for 'letters' now arrives via E-mail, and although there's no problem in general, 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 include your full postal address and call sign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'.

Editor

Practical Wireless, September 2001

☐ New Distributor

Power Appointment

The unit will also work direct from a car cigarette lighter socket and the Plus version is supplied with a universal 80 to 240V AC adaptor to allow it to be used anywhere in the world. The MH-C777 charger costs £49.95 and the MH-C777Plus, £89.95. For more information contact Nevada direct.



☐ Welsh Rally

Satellite on Show

The event takes place in the **Memorial Hall, Gladstone Road, Barry, Vale of Glamorgan, South Wales**. Contact **Brian Brown GW0PUP** on **(02920) 832253** for more details.

☐ Antenna Appointment

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ANTENNAS

MICRO MAG 2 Metre 70 cms
Super Strong 1" Mag Mount
(Length 22")£14.95
MR 700 2 Metre 70 cms (1/2 & 5/8
wave) (Length 20") (fitting)£6.95
MR 700 2 Metre 70 cms (1/2 & 5/8
wave) (Length 20") (SO239
fitting)£9.95
MR 777 2 Metre 70 cms 2.8 & 4.8
dBd Gain (5/8 & 2x5/8 wave)
(Length 60") (3/8 fitting)£16.95
MR 777 2 Metre 70 cms 2.8 & 4.8
dBd Gain (5/8 & 2x5/8 wave)
(Length 60") (SO239 fitting)£18.95
MR 775 2 Metre 70 cms 5.5 & 8.0
dBd Gain (1/2 & 3 x 1/2 wave) (Length
60") (SO239 fitting)£38.95

SINGLE BAND
MOBILE ANTENNAS

MR 214 2 Metre 1/2 wave
(fitting)£3.95
(SO239 fitting)£5.00
MR 258 2 Metre 1/2 wave 3.2 dBd
Gain (fitting) (Length 58")£12.95
MR 650 2 Metre 1/2 wave open coil
(3.2 dBd Gain) (Length 52")£9.95
MR 775 2 Metre 70 cms 5.5 & 8.0
dBd Gain (Length 19")
(SO239 fitting)£14.95
(fitting)£12.95
MR 776 70 cms 1/2 over 1/2 wave 6.0
dBd Gain (Length 27")
(SO239 fitting)£18.95
(fitting)£16.95
MR 444 4 Metre loaded 1/4 wave
(Length 24") (fitting)£12.95
(SO239 fitting)£15.95
MR 614 6 Metre loaded 1/2 wave
(Length 56") (fitting)£13.95
MR 644 6 Metre loaded 1/2 wave
(Length 40") (fitting)£12.95
(SO239 fitting)£15.95

TRI BAND MOBILE ANTENNAS

MR 800 2 Metre 70 cms 6 Metres
5.0, 7.5 & 3.0 dBd Gain (1/2, 3 x 1/2, 1/4
wave) (Length 60") (SO239
fitting)£39.95

1/2 WAVE VERTICAL FIBRE GLASS
(GRP) BASE ANTENNA 3.5 dBd
(without ground planes)

70 cms (Length 26")£24.95
2 metre (Length 52")£24.95
4 metre (Length 80") adjustable
top section£36.95
6 metre (Length 120") adjustable
top section£46.95

VERTICAL FIBRE GLASS
(GRP) BASE ANTENNAS

SQ & BM Range VX 6 Co-linear:
*Specially Designed Tubular Vertical
Coils individually tuned to within
0.05pf (maximum power 100watts)*
BM100 Dual-Bander£29.95
(2 mts 3dBd) (70cms 6dBd)
(Length 39")
SQBM100* Dual-Bander£39.95
(2 mts 3dBd) (70cms 6dBd)
(Length 39")
BM200 Dual-Bander£39.95
(2 mts 4.5dBd) (70cms 7.5dBd)
(Length 62")
SQBM200* Dual-Bander£49.95
(2 mts 4.5dBd) (70cms 7.5dBd)
(Length 62")
BM500 Dual - Bander
Super Gainer£49.95
(2 mts 6.8dBd) (70cms 9.2dBd)
(Length 100")
SQBM500 Dual - Bander
Super Gainer£59.95
(2 mts 6.8dBd) (70cms 9.2dBd)
(Length 100")
BM1000 Tri-Bander£59.95
(2 mts 6.2dBd) (6 mts 3.0dBd)
(70cms 8.4dBd) (Length 100")
SQBM1000* Tri-Bander£69.95
(2 mts 6.2dBd) (6 mts 3.0dBd)
(70cms 8.4dBd) (Length 100")
***SQBM 100/200/500/1000**
are Polycrystalline Fibre Glass with
Chrome & Stainless Steel
Fittings. 2 years warranty.

2 METRE VERTICAL CO-
LINEAR BASE ANTENNA

BM60 1/2 Wave, Length 62", 5.5dBd
Gain£49.95
BM65 2 X 1/2 Wave, Length 100", 8.0
dBd Gain£69.95

70CMS VERTICAL CO-
LINEAR BASE ANTENNAS

BM33 2 X 5/8 wave Length 39" 7.0
dBd Gain£34.95
BM45 3 X 5/8 wave Length 62" 8.5
dBd Gain£49.95
BM55 4 X 5/8 wave Length 100"
10 dBd Gain£69.95
TRI-BANDER BEAM 5dBd all bands
TBB3 3 Element 6mts, 2mtr, 70cms,
Boom Length 1.1mts, Longest
Element 3mts, 5.00 dBd Gain.£65.95

HB9CV 2 ELEMENT
BEAM 3.5 dBd

70cms (Boom 12")£15.95
2 metre (Boom 20")£19.95
4 metre (Boom 23")£27.95
6 metre (Boom 33")£34.95
10 metre (Boom 52")£64.95

MINI HF DIPOLES
(length 11' approx)

MD020 20mt£39.95
MD040 40mt£44.95
MD080 80mt£49.95

CROSSED YAGI BEAMS

All fittings Stainless Steel

2 metre 4 Element
(Boom 64") (Gain 7.5dBd)£74.95
2 metre 8 Element
(Boom 126") (Gain 11.5dBd)£94.95
70 cms 13 Element
(Boom 83") (Gain 12.5dBd)£74.95

YAGI BEAMS

All fittings Stainless Steel

2 metre 4 Element
(Boom 48") (Gain 7dBd)£24.95
2 metre 5 Element
(Boom 63") (Gain 10dBd)£44.95
2 metre 8 Element
(Boom 125") (Gain 12dBd)£59.95
2 metre 11 Element
(Boom 185") (Gain 13dBd)£89.95
4 metre 3 Element
(Boom 45") (Gain 8dBd)£49.95
4 metre 5 Element
(Boom 128") (Gain 10dBd)£59.95
6 metre 3 Element
(Boom 72") (Gain 7.5dBd)£54.95
6 metre 5 Element
(Boom 142") (Gain 9.5dBd)£74.95
70 cms 13 Element
(Boom 76") (Gain 12.5dBd)£49.95

ZL SPECIAL YAGI BEAMS ALL
FITTINGS STAINLESS STEEL

2 metre 5 Element
(Boom 38") (Gain 9.5dBd)£39.95
2 metre 7 Element
(Boom 60") (Gain 12dBd)£49.95
2 metre 12 Element
(Boom 126") (Gain 14dBd)£74.95
70 cms 7 Element
(Boom 28") (Gain 11.5dBd)£34.95
70 cms 12 Element
(Boom 48") (Gain 14dBd)£49.95

HALO LOOPS

2 metre (size 12" approx)£12.95
4 metre (size 20" approx)£18.95
6 metre (size 30" approx)£24.95

MULTI PURPOSE
ANTENNAS

MSS-1 Freq RX 0-2000 Mhz, TX 2
mtr 2.5 dBd Gain, TX 70cms 4.0
dBd Gain, Length 39"£39.95
MSS-2 Freq RX 0-2000 Mhz, TX 2
mtr 4.0 dBd Gain, TX 70cms 6.0
dBd Gain, Length 62"£49.95
IVX-2000 Freq RX 0-2000 Mhz,
TX 6 mtr 2.0 dBd Gain, 2 mtr
4dBd Gain, 70cms 6dBd Gain,
Length 100"£89.95

G5RV Wire Antenna
(10-40/80 metre)

All fittings Stainless Steel

	FULL	HALF
Standard	£22.95	£19.95
Hard Drawn	£24.95	£21.95
Flex Weave	£32.95	£27.95
PVC Coated		
Flex Weave	£37.95	£32.95
TS1 Stainless Steel Tension Springs (pair) for G5RV	£19.95	

POWER SUPPLIES

PS-20 20amp with 25amp surge
Dual Meter & Adjustable Voltage 5-
15v£99.95
PS-30 30amp with 35amp surge
Dual Meter & Adjustable Voltage 5-
15v£119.95

SHORT WAVE RECEIVING
ANTENNA

MD37 SKY WIRE (Receives
0-40Mhz)£29.95
Complete with 25 mts of enamelled
wire, insulator and choke Balun
Matches any long wire to 50 Ohms.
All mode no A.T.U. required. 2 "S"
points greater than other Baluns.
MWA-H.F. (Receives 0-30Mhz)£29.95
Adjustable to any length up to 60
metres. Comes complete with 50
mts of enamelled wire, guy rope,
dog bones & connecting box.

MOUNTING HARDWARE

ALL GALVANISED

6" Stand Off Bracket
(complete with U Bolts)£6.90
9" Stand off bracket
(complete with U Bolts)£9.90
12" T & K Bracket
(complete with U Bolts)£11.95
18" T & K Bracket
(complete with U Bolts)£17.95
24" T & K Bracket
(complete with U Bolts)£19.95
36" T & K Bracket
(complete with U Bolts)£29.95
3-Way Pole Spider for Guy Rope/
wire£3.95
4-Way Pole Spider for Guy Rope/
wire£4.95
1 1/2" Mast Sleeve/Joiner£8.95
2" Mast Sleeve/Joiner£9.95
Solid copper earth rod 4'£9.95

POLES H/DUTY (SWAGED)

1 1/2" x 5' Heavy Duty Aluminium
Swaged Poles (set of 4)£24.95
1 1/2" x 5' Heavy Duty Aluminium
Swaged Poles (set of 4)£34.95
2" x 5' Heavy Duty Aluminium
Swaged Poles (set of 4)£49.95

REINFORCED HARDENED
FIBRE GLASS MASTS (GRP)

1 1/2" Diameter 2 metres long£16.90
1 1/2" Diameter 2 metres long£20.90
2" Diameter 2 metres long£24.90

GUY ROPE 30 METRES

MGR-3 3mm (maximum load
15 kgs)£6.95
MGR-4 4mm (maximum load
50 kgs)£14.95
MGR-6 6mm (maximum load
140 kgs)£29.95

COAX

RG58 best quality
standard per mt35p
RG58 best quality
military spec per mt60p
best quality military spec
mini 8 best quality per mt70p
RG213 best quality
military spec per mt85p
H200 coax cable per mt£1.10
PHONE FOR 100 METRE DISCOUNT PRICE.

10/11 METRE VERTICALS

G.A.P.12 1/2 wave aluminium
(length 18' approx)£16.95
G.A.P.58 5/8 wave aluminium
(length 21' approx)£19.95

BALUNS

MB-1 1:1 Balun£23.95
MB-4 4:1 Balun£23.95
MB-6 6:1 Balun£23.95

RIBBON LADDER USA IMPORTED

300Ω Ribbon (20 Metres)£13.90
450Ω Ribbon (20 Metres)£13.90

TRI/DUPLEXER &
ANTENNA SWITCHES

MD-24 (2 Way Internal Duplexer)
(1.3-35 Mhz 500w) (50-225 Mhz
300w) (350-540 Mhz 300w) insert
loss 0.2dBd SO239 fittings£24.95
MD-24N same spec as MD-24 "N-
type" fitting£22.95
MD-25 (2 Way external/Internal
Duplexer) (1.3-35 Mhz 500w) (50-225
Mhz 300w) (350-540 Mhz 300w)
insert loss 0.2dBd£24.95
CS201 Two way antenna switch,
frequency range 0-1GHz, 2.5 Kw
Power Handling SO239 fittings£18.95
CS201-N same spec as CS201 "N-
type" fitting£28.95
Tri-plexer 1.6-60Mhz (800w) 110-
170Mhz (800w) 300-950Mhz (500w)
SO239 fitting£49.95
4 way antenna switch
0-500Mhz£29.95

ANTENNA ROTATORS

AR-300XL Light duty UHF
VHF£49.95
YH-130 Medium duty VHF£79.95
RC5-1 Heavy duty HF£349.95
RG5-3 Heavy Duty HF inc Pre Set
Control Box£449.95
AR26 Alignment Bearing for the
AR300XL£18.95
RC26 Alignment Bearing for
RC5-1/3£49.95

ROTATOR CABLE

3 Core0.45p per metre
7 Core0.80p per metre

MOUNTS

Turbo mag mount
(7") 1/2 or SO239£14.95
Tri-mag mount
(3x5") 1/2 or SO239£39.95
Stainless Steel Heavy Duty
Hatch Back Mount with 4 mts of
coax and PL259 plug (1/2 or SO239
fully adjustable with turn
knob)£29.95
Stainless Steel Heavy Duty
Gutter Mount with 4 mts of coax
and PL259 plug (1/2 or SO239 fully
adjustable with turn knob)£29.95

BEST QUALITY
ANTENNA WIRE

The Following Supplied in 50 metre lengths
Enamelled 16 gauge copper
wire£9.95
Hard Drawn 16 gauge copper
wire£12.95
Multi Stranded Equipment
wire£9.95
Flex Weave£27.95
Clear PVC Coated Flex
Weave£37.95

INDUCTORS

Convert your g5rv half size into a
full size with only a very small
increase in size. Ideal for the small
garden.£21.95

TRAPS

10 metre trap 400W£23.95
15 metre trap 400W£23.95
20 metre trap 400W£23.95
40 metre trap 400W£23.95
80 metre trap 400W£23.95

All prices plus £6.00 P&P per order

Callers welcome.

Opening times:

Mon-Fri 9-6pm

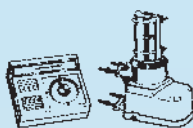
UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD
WOBBURN SANDS, BUCKS MK17 8UR. sales@moonrakerukltd.com



£99.95**LOG PERIODIC MLP32**

Freq. Range 100-1300MHz

Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware. (The Ultimate Receiving Antenna - a must for the Dedicated Listener.)

**ROTATOR AR-300XL**

* Rotation Torque-222Kg

* Vertical Load-45Kg

* Mast Size - 28-44mm

* Control Box-230v AC

* Cable-3 core

* Direct Compass Bearings
(Ideal for Light to Medium Beams, i.e. LOG PERIODIC above.)

£49.95**6" STAND OFF BRACKET**

Complete with 'U' Bolts

£6.00**9" STAND OFF BRACKET**

Complete with 'U' Bolts

£9.00**MD37 SKY WIRE (LONG WIRE BALUN KIT)**

25 METRES OF ENAMELLED WIRE & INSULATOR

FOR USE ON WITH RECEIVER 0 - 40 Mhz. ALL MODE NO ATU REQUIRED 2 "S" POINTS GREATER SIGNAL THAN OTHER BALUNS. MATCHES ANY LONG WIRE TO 50 OHMS



IMPROVED RECEPTION

£29.95**5' SWAGED POLES**

Heavy Duty Ali (1.2mm wall)

SINGLE 1 1/4"£7.00

SET OF FOUR 1 1/4"£24.95

SINGLE 1 1/2"£10.00

SET OF FOUR 1 1/2"£34.95

CONNECTORS

PL259/90.75 each

PL259/60.75 each

PL259/7 for mini 81.00 each

BNC (Screw Type)1.00 each

BNC (Solder Type)1.00 each

N TYPE for RG582.50 each

N TYPE for RG2132.50 each

SO239 to BNC1.50 each

PL259 to BNC2.00 each

N TYPE to SO2393.00 each

Amalgam tape 10 metres£7.50

CABLE

RG213 MILITARY0.85 per mtr.

MINI RG80.85 per mtr.

RG58 STANDARD0.35 per mtr.

RG58 MILITARY0.60 per mtr.

H100£1.10 per mtr.

WEATHER SATELLITE ANTENNA**TURNSTILE 137**

Freq. 137.5 MHz

Length 1000mm

(Simple and easy to install a must for the enthusiast who has it all.)

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

**£39.95**

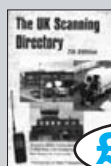
(Simple and easy to install a must for the enthusiast who has it all.)

MRW-40 (Rubber Duck)

Dedicated for Civil & Military Airband

VHF/UHF RX & TX Capabilities

Length 215mm. P.P £2.00

£19.95**UK SCANNING DIRECTORY**

7th edition

£19.50**£29.95****SUPER SCAN STICK**

Freq. Range 0-2000MHz

Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna.

It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike.)

(For the expert who wants that extra sensitivity)

(Ideal for the Ham Radio user)

(Ideal for the control tower & aircraft listener)

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£39.95**SUPER SCAN STICK II**

Freq. Range 0-2000 MHz

Length 1500mm.

This is designed for external use. It will receive all frequencies at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. (For the expert who wants that extra sensitivity)

(Ideal for the Ham Radio user)

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£39.95**MULTISCAN STICK**

Freq. Range 0-2000 MHz

Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike.

Comes complete with mounting hardware and brackets.

(Ideal for the amateurs ham radio - user).

(Ideal for the control tower & aircraft listener)

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Radio Basics

Keen to build your own 'clock' to monitor the International Beacon Project on the h.f. bands? In the second part of the project Rob Mannion G3XFD describes calibration and an alternative system using a specific motor.

Last time, after describing the fabrication of the International Beacon Project (IBP) 'clock' using a surplus synchronous motor we end up with a Long Playing (LP) disc which rotates once every three minutes. However, **you'll be very fortunate indeed** if the 'dial' rotates accurately within that time and it's likely you'll have to calibrate the system.

Calibration is very simple, and it can be made even simpler if you have access to a stopwatch or even an ordinary watch with this facility. Once it's calibrated you'll be able to monitor the beacons even though you may not be able to read the 22w.p.m. transmissions. However, it's surprising just how easily transmissions can be recognised - my wife Carol proved that when she (a non Morse reader) identified several beacons after hearing them several times and relating the rhythm of the signal to the clock face indicated call sign.

Ran Slow

All three of my rim-drive prototypes ran slow - in other words each 20° section (10 seconds) passed the calibration pointer in more than 10 seconds. So, the simplest way to speed them up was to spin grind the old LP disc to produce a slightly smaller diameter - less complicated than altering the rim drive!

I clamped one of my 12V battery-powered drills into the bench vice and mounted the disc in the chuck using a nut on either side of a suitable bolt. **Warning: This method is only suitable for a drill which incorporates speed control or rotates at less than 800r.p.m. as there's a danger of vibration shaking it free with possible injury resulting.**

When the disc is spinning a folded section of (medium grade) glasspaper is applied (gently) to the rim of the LP to gradually remove a layer of vinyl. A face mask and a dust coat is recommended as the material gets everywhere!

Grinding down is a case of trial-and-error I'm afraid. There's no alternative unless you have extremely accurate measuring equipment as the difference in diameters (and consequently the speed) are very small indeed. However, I soon achieved rotations of nine seconds and 89 hundredths of a second on one

disc and 10 seconds and 10 hundredths for another disc. Such accuracy is perfectly suitable for several hours monitoring - have fun!

However, if you wish to build a 'clock' using a dedicated motor with ready built gearbox, try making MkII. **Although simpler, this will require a specific motor to be purchased for £20 (see information panel)** but in return it will give instant results and keep excellent time.

Building MkII

Building the MkII IBP clock is achieved with a one-third revolution per minute (1 rev-per-three-minutes) motor. The recommended motor's output shaft rotates in a clock-wise direction and is long enough for disc mounting purposes. It's also the same diameter as modern potentiometer shafts, etc., so it's easy to find something in the junk box to couple it to your chosen clock face.

The photograph, **Fig. 1**, shows my completed MkII version with a G3XFD-drawn 18 section 'dial'. (See information panel). I've decided that the rotating disk clock face is best. With this method you can follow a particular beacon up the bands at a glance or monitor one band very easily.

However, if you prefer a fixed clock face (at the expense of a more complicated dial) it's possible of course to mount a moving pointer (the hand) to the motor drive shaft. Concentric rings (one for each band) can then be drawn onto the clock face. All you have to do is to move each beacon one 'slot' (20°) to the right for each band's ring and remember to watch the correct concentric ring!

To help further I'll explain the IBP system fully: On the hour, starting on 14.100MHz, 4U1UN (No. 1 beacon) transmits for 10 seconds sending its callsign at 22w.p.m. and then four discrete power level dashes starting at 100, 10 and 1W ending up with 100mW. Then the beacon does the same on 18.110, 21.150*, 24.930

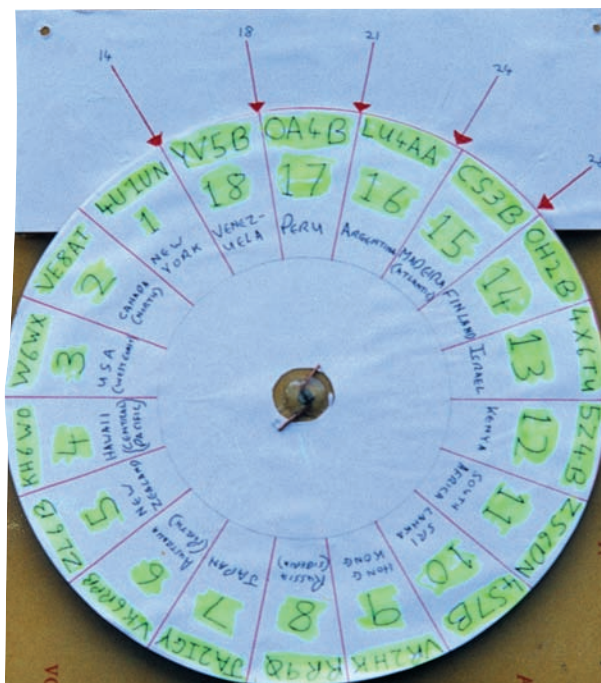


Fig. 1: The MkII IBP monitoring clock prototype built by G3XFD. This version uses a dedicated one-revolution-every-three-minutes mains synchronous motor available from a specific supplier. (See text for constructional details).

and 28.200MHz. So the last transmission in the three minute cycle for 4U1UN will be on 28.200MHz - 50 seconds later than on 14.1MHz. It then goes silent until the start of the next cycle.

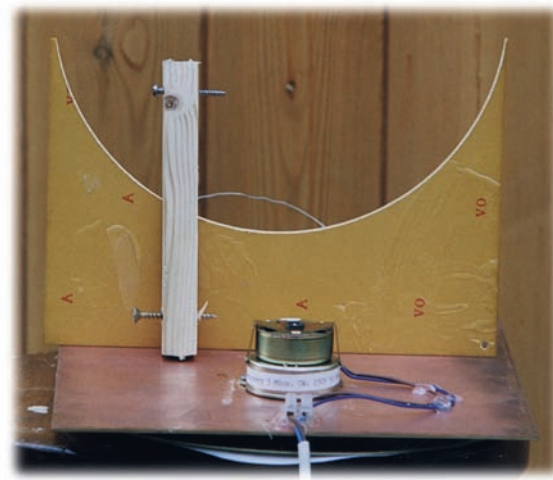
The other 17 beacons (maintenance, equipment failure, conditions and other reasons permitting) all follow - sequencing westwards all the time, ending up back in New York at the end of the cycle - in their own 10 second slots.

**My apologies...I noticed (after publication) that in the August PW I typed in the wrong 15 metre frequency. That shown this month is correct. G3XFD*

Clock Face & Motor

I cut the clock face disc from p.c.b. material using the radius arm method described before.

Fig. 2: Section of p.c.b. material left-over and home-brewed radius arm cutter used to cut the discs for either version of the clock. Also shown is the mains driven synchronous motor mounted on the main board (see text).



A section of the remaining p.c.b. material is shown in **Fig. 2**, along with the simple radius arm (see last month's explanation) and the motor itself.

The motor is mounted directly onto the main board. Using thin SRPB material there's just enough shaft left protruding on the other side.

Together with a suitable bush (from an old potentiometer) the disk is then mounted directly on to the motor shaft and makes an easy push-fit. A slot (made with a hacksaw) is then cut into the end of the shaft deep enough to accept an S-shaped length of copper wire into it. With the dial in place I secured the S-clip with hot-melt glue (It's easy to remove for adjustments using this method).

I then stuck the pre-drawn dial face on to the disc using a glue-stick. **But please...take great care drawing the 18 separate 20° sections!** It's all too easy to find that when you've gone round the 360° of the paper cut-out to find you've made a mistake and some sections are not 20° apart. This means that your clock's timing cannot be accurate.

Setting Up & Use

My clock just hangs in front of me in the shack but it can be boxed up. It's simple to set-up and if you have Teletext* you've already got access to an accurate clock. To start - let it rotate until 4U1UN 20° time 'slot' is directly opposite the 14MHz band marker and then switching the power off.

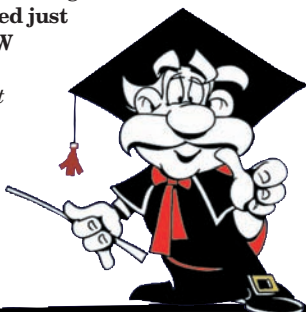
When setting my clock working I switch on my TV, and (choosing any of the on-the-hour, or three minute multiples) I start my stop watch one minute before the cycle begins, take it with me to the shack and start the motor running when the minute is up.

My clock has kept excellent time (within one 20° slot) for up to 12 hours and is ideal for monitoring propagation. Much good DX - especially QRP - has been worked thanks to the 100mW signal which (when heard) is an excellent guide to just how good propagation is. **And you'll be surprised just how often you do hear those 100mW transmissions!**

**Avoid using digital satellite Teletext because of the delays introduced by the earth-satellite-earth + decoding delays which can be significant.*

Good luck - and good monitoring with your own clock.

PW



Information Panel

Important Information - Buying The Motor

For those readers making their own IBP Clock using the one-revolution-per-three-minutes synchronous motor, thanks to their full support and very helpful co-operation I've arranged for **The Service Trading Company**, based in Chiswick, London, to supply the specific unit. The motor, operating from European 50Hz 230V a.c. mains supply will cost £20 including post and packing.

Because Service Trading had to order a minimum quantity of the motors to keep prices down, I'm asking readers who plan to build the 'clock' to order their motor as soon as possible. So, please don't regard this - as many readers like to do - as a project for a rainy day! Send your order direct to (Not to PW please) to **The Service Trading Company, 57 Bridgman Road, Chiswick, London W4 5BB. Tel: 0208-995 1560, FAX: 020 8995 0549**, asking for the *PW* Radio Basics Beacon Clock motor.


Finally, if you want a photocopy of the 'clock' face (drawn to publishing standards by **Tex Swann G1TEX**) ready-to-use or for you scale up or down to suit, please send an A5 s.a.e. (1st class stamp) marked 'Radio Basics Beacon Clock Details' to the *PW* Editorial offices as soon as possible.

Rob Mannion G3XFD


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294 2468. FAX: 0270-
294 2400 - can provide a
list of all courses running
this year.

**The Radio Licensing
Centre (RLC), Bristol.**
Tel: 0117-925 8333 -
act as the licensing
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copies of the free booklet
*How To Become A Radio
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**Radio Society of
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659015 - national
society.

**Radiocommunications
Agency (RA).** Tel: 020-
7211 0211 - deal with
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Forget computers, the Internet and video games and discover radio! Yes it's that time of year again and to help you on the road to getting your Amateur Radio 'ticket' we've compiled a brief list of **RAE**, **Novice RAE** and **Morse** courses that we have been informed of, to help you on your way. The list has been compiled from details we have received and if there isn't a course listed here in your area don't panic - simply contact City & Guilds for information on other courses.

So, there's absolutely no excuse for all you 'would-be' Radio Amateurs - why not encourage a friend to have a go too and together you'll discover the fascinating secrets behind radio communication.

Step 1

Pick a course in or near your area and get yourself enrolled! If there isn't one contact City & Guilds for further details.

Step 2

Attend your course every week, study hard and read 'Radio Basics' in *PW* every month to help you along.

Step 3

Revise, sit your exam and who knows hopefully your name will be among the new batch of Licensees!
Good Luck!

So, what are you waiting for?

Bexley College will be starting **RAE** courses from **10 September** with enrolment on **4/5/6 September** at the main college site in **Tower Road, Belvedere, Kent** between 1000 and 2000hrs. The course will run for an academic year with students able to take the exam in May 2002. The centre is unable to offer the exam to external candidates. A Morse course will be taught from May-July 2002 and will be offered to students enrolled on the RAE course. To enrol or find out more contact the **Guidance & Admissions Centre** on **(01322) 404000**.

Bishop Auckland Radio Amateur's Club are running courses for **RAE** and **NRAE** starting in **early September**. Courses will commence at 2000hrs on Thursdays and will be held in the **Stanley Village Hall, Crook, County Durham**. Further details from **Tim Bevan M0ACV** on **(01388) 832948**.

Farnborough College of Technology will be running **RAE** and **Morse** courses this year. The RAE course starts on **20 September** at 1930-2130hrs and runs for 30 weeks. The Morse class also starts on **20 September** but at the earlier time of 1830-1930hrs and runs for 25 weeks. To enrol or for more information contact **Farnborough College of Technology Information Centre** on **(01252) 407040**.

Mexborough Amateur Radio Society will be offering training for **RAE** and **Morse** starting on **21 September** at 1900hrs at **Harrop Hall, Mexborough, South Yorkshire**. Enrolment for the RAE course takes place on **14 September** with the Morse running on a rolling program. **Eric G3MWN** is the RAE instructor and **Norman G0SKD** will be teaching the Morse classes. For more details contact **Tom G0KSK** on **(01709) 586329** or **Roy G0FYM** on **(01977) 645691**.

Newbury Technical College will again be running an **RAE** course this year. Starting on **20 September** each session will run between 1900-2100hrs. Contact **Newbury Technical College** on **(01635) 845215**, E-mail: **ace@newbury-college.ac.uk** or from **Ray Oliver** on **(01672) 870892**, E-mail: **ray.oliver@which.net**

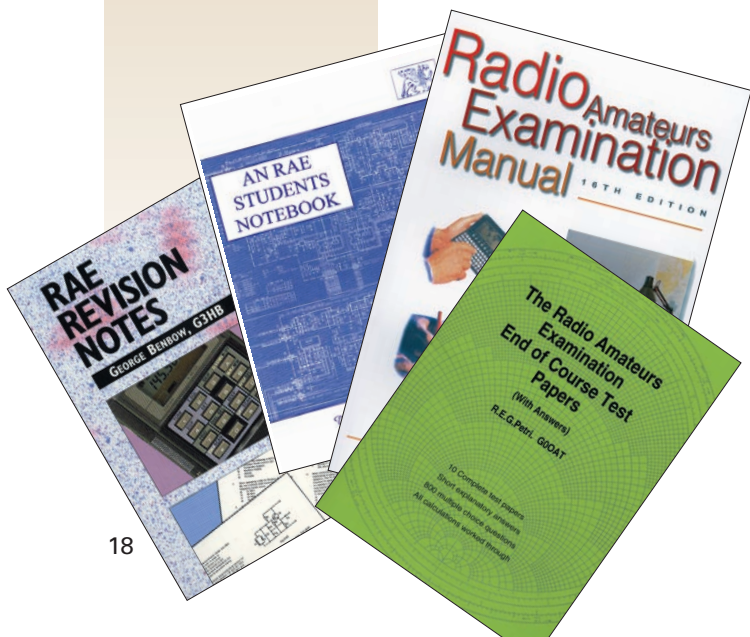
Newstead Wood Girls School, Orpington will be running an **RAE** course commencing **Monday 10 September**, 1930-2130hrs leading to the May 2002 exam. Enrolments should be made to **Bromley Adult Education College, Widmore Centre, Nightingale Lane, Bromley, Kent**, Tel: **0208-460 0020**. Please enrol at least two weeks prior to the course. Enquiries to the tutor, **Alan G0HIQ** on **(01689) 831123**.

Radio Society of Harrow will be restarting its **Novice** course on **September 17 2001**. The course will be held at Ruislip at the QTH of **Don G0ACK**. If you are interested in joining you should contact Don as soon as possible on **0208-845 9575**.

Sandwell Amateur Radio Club will be running its usual **RAE** course starting this year on **Thursday 13 September**. Enrolment for the course will take place on Thursday 6th. The club meets at **The Broadway, Warley, West Midlands**. For further details of the course, please contact any of the following: **Archie G40JJ**, Tel: **0120-532 7039**, **Martin G2BXP** Tel: **0121-552 4902** or **Clive G0TVR**, Tel: **0121-429 6061**

Widnes and Runcorn ARC will be running **NRAE**, **RAE** and **Morse** classes on **Friday** nights at the **Bunker, Simons Lane, Frodsham, Cheshire** at 1900hrs, starting early in **September**. For further details please call course tutors **Dave G1PIX** on **(01928) 591401** or **Dave G7OBW** on **(01270) 761608**.

- Taking the RAE? - Boost your learning with these useful books, designed to help you along the way. Buy them now from the PW Book Store - prices in the listing on pages 64 & 65 - and save money by using your free discount voucher this month!



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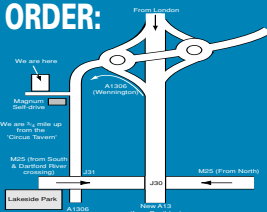
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Looking At...

The Audio Stages Part 2

Gordon King G4VFF continues with his look at the audio stages.

Since the advent and subsequent evolution of the transistor, many and varied have been the audio stages developed around them. It can be seen that even the valve circuit considered in Looking At in *PW* July had its virtual transistor counterpart. Rapid was the seeming evaporation of valved audio stages in favour of solid-state devices. Some of the earliest output stages, for instance, used an input transformer for coupling the signals from the pre-amplifier to the base of a single *pnp* transistor or to a pair of them for push-pull working. The input signal was fed to the primary winding while, for push-pull, a centre-tapped secondary winding fed the signal to the bases with the required 180° phase difference between them.

An output transformer coupled the signal from the collector or collectors to the loudspeaker. Here the two halves of the push-pull signal were reconstituted, while the ratio of the transformer's primary to secondary turns gave the correct impedance match for the loudspeaker. In the push-pull case, the collectors were connected across a centre-tapped primary winding. The loudspeaker was fed from the secondary winding.

Widley Adopted

Evolution brought forth the classic, and very widely adopted, output stage shown in Fig. 1. Because this circuit employs *pnp/npn* transistor pairs it is known as a complementary symmetry circuit. Its popularity increased as transistors capable of handling higher and higher audio power became available in opposite polarity pairs.

The circuit works in the following way. Firstly, it's transformerless, hence the

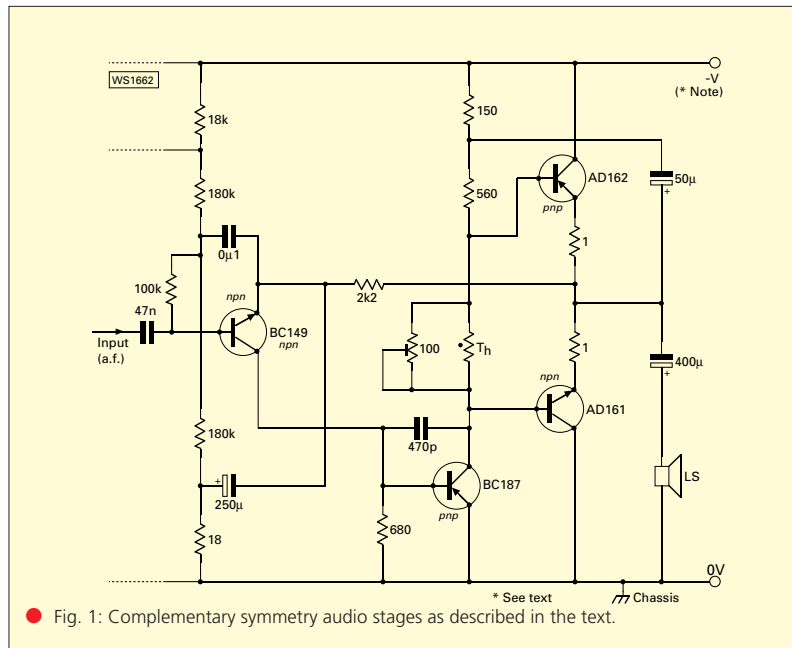


Fig. 1: Complementary symmetry audio stages as described in the text.

distortion introduced by even the best of transformers is totally absent. Just the job for hi-fi buffs!

The complementary transistors responsible for the output power are the *nnp* AD161 and the *pnp* AD162. They are arranged as emitter-followers, biased at their bases by the potential-divider consisting of the 150 and 560Ω resistors connected to the negative line, the 100Ω preset resistor in parallel with the thermistor T_h and the collector/emitter path of the *pnp* BC187 driver transistor.

The BC187 transistor delivers a common-phase signal to the bases of both the AD161 and AD162, but because one transistor is *nnp* and the other *pnp* they are effectively driven in true push-pull mode, one swinging towards forward conduction while the other is swinging towards reverse conduction on each of the two halves of a signal cycle. The 1Ω resistors in the emitter circuits of the output pair and the thermistor help to stabilise the d.c. conditions against variations in ambient temperature.

Audio Frequency

Audio frequency current from the emitters of the AD161 and AD162 is fed to the loudspeaker through the 400μF electrolytic capacitor. The 50μF electrolytic connected back to the junction of the 150 and 560Ω resistors in the base circuit introduces a shade of positive feedback. This increases the input impedance (without introducing instability) which enhances the swing of the drive voltage. This technique is known as bootstrapping.

The potential at the centre point of the emitter circuit approximates half the voltage of the supply rail. When the drive swings positive the AD161 swings towards conduction and the AD162 towards cut-off, and conversely when the drive swings negative the AD162 swings towards conduction and the AD161 towards cut-off. This means that the peak of the signal voltage approximates half the supply rail voltage (excluding the effect of the emitter resistors).

For an audio output of 3W

average power into a 4W loudspeaker the peak voltage is given by $[(W \times R)^{0.5} \times 1.414]$ which, in this example, works out to almost 4.9V $[(3 \times 4)^{0.5} \times 1.414 = 4.898]$. This means that the supply rail will need to be at least twice this value or around 9.8V.

Audio input is applied to the base of the *nnp* BC149 pre-amplifier transistor and the output signal is directly-coupled to the base of the BC187 driver transistor. Voltage negative feedback is

provided by the 2.2kΩ resistor connected from the loudspeaker circuit back to the emitter of the BC149.

The 100nF and 470pF capacitors across the BC149 and BC187 transistors tailor the frequency response, while the 100Ω preset resistor is used to balance the centre-point voltage of the output transistors. Personally, I think it's best adjusted with an audio oscillator and oscilloscope for equal clipping on the positive and negative peaks of a sine wave under conditions of slight overdrive.

Crossover distortion is another factor to be considered, especially in designs veering towards class B biasing conditions, where the collector current of each transistor in turn may be virtually cut-off on alternate half cycles of drive signal. Such designs usually feature a preset resistor which allows the kink between the positive and negative half cycles of output signal, resulting from crossover imbalance, to be eliminated or, at least, substantially reduced. Crossover distortion is subjectively vulgar!

Continued on page 24

Out of Sight - Out of Mind?

Bill Brown G3NQX describes some low visual impact antennas that could ease relationships with neighbours who dislike antenna farms.

A major problem facing many Radio Amateurs is the visual impact of outside antennas causing distress to neighbours. One solution to this problem could be the use of vertical antennas, either of commercial trapped, or home-brewed (like G3XFD's Picnic-Pole) format.

As I'll describe later, even vertical antennas on the car can be pressed into use if things are that bad. But let me start with some information about vertical antennas in the garden.

Ground Level

In general, if a vertical antenna, or pole, is less than

so, keeping it out of your own and your family's way too!

If you do most of your operating after dusk, or when the neighbours are at work, then a quarter-wave vertical for 7MHz (10m high) could be used to great advantage like on a short pole. By extending the support pole a little, but without rising above the ridge of the house, it can become the support for a v.h.f. or u.h.f. vertical antenna without too much visual impact.

Older Property

If your house is L-shaped like many older properties, then you can reduce the visual impact even more. Put the pole up in

hang vertically when not in use (Fig. 3).

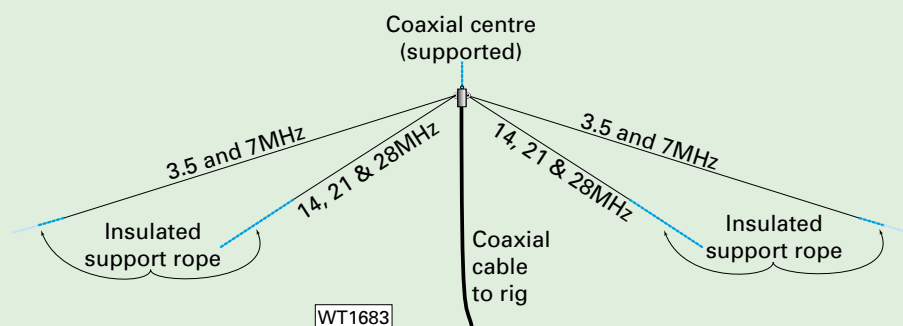
My final observation of where to mount an antenna is to consider running the elements of your horizontal doublet around the outside of the roof or under the guttering. The vast majority of guttering is now plastic and as such can make an ideal support for a wire running around most of the roof line. The next time you have some work done on the guttering have a doublet antenna laid in the supports at the same time.

Not Available

But if even this operating capability is not available to you - what do you consider

next? The next option I'd suggest is to put an h.f. mobile whip on your car standing in the driveway and use that. Perhaps not as effective as a full-sized 1/4 vertical for the lower bands, but a vehicle mounted antenna system (Fig. 4) fed via coaxial cable from the shack is more effective than nothing.

When not in use, or when you're about to put the car in gear and drive off, don't forget to disconnect the coaxial cable feeder! It's an embarrassment having the rig follow you down the road, like a tin-can on a wedding car! You will probably need a good antenna tuning unit to cope with loading this arrangement properly.



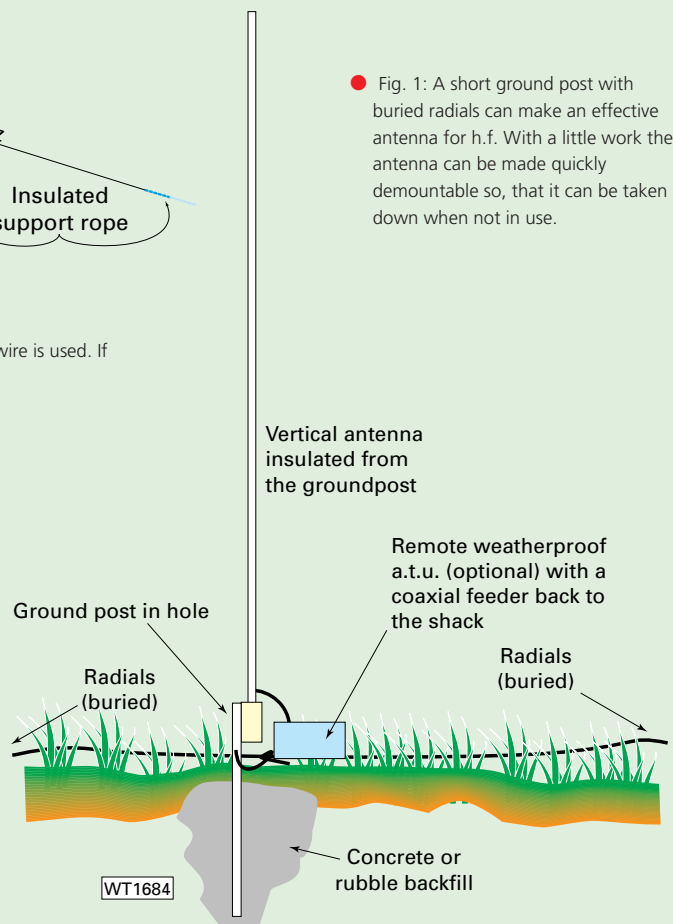
● Fig. 2: Inverted V antennas can be of low visual impact if a thinner neutral coloured wire is used. If multiple bands are to be used, then a nest of inverted Vs may offer advantages.

three metres tall and mounted at ground level to the side or rear of the property then, generally no planning permission is needed. If the antenna is longer than this, then a short mounting pole set in a ground socket will allow the antenna to be removed when not in use.

If using a ground socket (Fig. 1) remember to add a little to the feedline and ground radials to allow the antenna to be lifted out of the socket and laid flat on the ground. Laid on the ground in your own garden, it should be out of everyone's way, but remember to put it to one side

the inside corner of the house and it will be visually shielded from two sides at least. And any that should poke above the roof apex is less visual to a casual observer

A taller support pole near the house, or a shorter pole mounted on the gable end of the property could become the support for the centre of one, or more, inverted V doublet antennas (Fig. 2) that could be made to work on bands as low as 3.5MHz. Using wire with a neutral colour it will soon blend in with most people's view of the world. Even better if the elements can be released to



● Fig. 1: A short ground post with buried radials can make an effective antenna for h.f. With a little work the antenna can be made quickly demountable so, that it can be taken down when not in use.

Continued on page 24

Craggy Criggion- Wartime Wizardry

Hari Williams shares the fascinating history of the unique Criggion radio transmitter. If you've ever been puzzled by the site of the station's antenna wires anchored to a Welsh mountain, read on to discover more!



- The three original masts, each 185m in height. The Criggion transmitter is unique in the United Kingdom as it uses a convenient Welsh mountainside as an antenna anchorage point! Hari Williams explains why in his fascinating potted history of 'Craggy Criggion'.

Anyone travelling within the triangle formed by the towns of Shrewsbury, Oswestry and Welshpool - particularly on the A5 road - will have noticed the tall radio masts rising from the flood plain of the river Severn. Close to the steeply rising Breidden Hill, near the village of Criggion in Montgomeryshire, Wales, they

- Emergency power is provided by Criggion's own the stand-by diesel powered generator set which can be brought into operation rapidly if the mains supply fails.

mark the site of the British Telecomm International's (BTI) Criggion transmitting station.

This article provides a brief history of the station from its inception in 1940 up to the end of 2000. It's based partly on my own

memories when working there in the 1940s and on published material from Post Office (PO) and BT sources.

During the 1940s, the station received telegraph signals from Government and military centres in and around London. These arrived over PO cables and were then transmitted automatically to various receiving sites, world-wide, with no intervention by the station staff. Most of the traffic went over directional short wave (h.f.) links to Allied Naval bases and to military field HQs.

Long Wave Transmitter

A powerful long wave (l.w.) transmitter, operating on behalf of the Admiralty, provided a world-wide broadcast service to ships at sea and was predominantly high-speed security encoded Morse. A less

extensive maritime broadcast service was provided by two other l.w. sets of lower power but higher frequency.

Our tasks as Engineers on each shift, were to keep the transmitters in working order and to bring them on or shut them down. This was done either according to a schedule or in response to requests received over telegraph

lines from London.

Requests were also received to change transmitter frequencies, so as to correct for the loss of signals at distant receiving stations. This signal fading was caused by changes in the propagation skip distance, brought about by variations in the height above the earth of ionised layers in the ionosphere.

The origins of the Criggion transmitter go back to January 1926 when the PO brought into service a very powerful l.w. telegraph transmitter at its Rugby radio station in Warwickshire. This operated on a frequency of 16kHz, with the now famous callsign GBR.

At the outbreak of the Second World War, this GBR set was reserved for Admiralty use. So great was its importance that in the summer of 1940, the PO made plans for a standby GBR transmitter at another location.

Steel Shortages

No tall masts were readily available to support the proposed antenna and because of wartime steel shortages, new masts could not be fabricated quickly enough to meet the needs of the Admiralty. However, three self-supporting steel masts, each 185m in height, became available to the PO when an overseas order was cancelled.

Three masts were not enough to support the large antenna envisaged and the search continued for a possible site. One was eventually found at Criggion, where the Breidden Hill offered a suitable platform for antenna anchorages at a height of about 250m (820ft) above the Severn valley floor.

The original l.w. antenna at Criggion consisted of wire cages, 2.5m in diameter, arranged in the form of two adjacent, horizontal, equilateral triangles. The apex of each was supported from a hilltop



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★ Radial Length 1400mm ★ Weight 6.0 Kilos ★ Connector SO239 UHF

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★ Impedance 50 ohms ★ Radiation Directional
★ Polarization Horizontal ★ V.S.W.R 1.2-1
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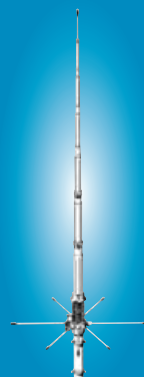
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($\lambda/4/2/70/23\text{cm}$)
Receive freq: 50-1300MHz
- ★ Forward Gain: 10-12dB
- ★ Forward to Back ratio: 15dB
- ★ Boom Length: 2mts
- ★ Elements: 20
- ★ Longest Element: 3mts
- ★ Connector 'N Type'
- ★ Mast up to 2"
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- ★ VSWR: <2.0:1
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anchorage, the base being suspended between two towers. The antenna feed was connected to the mid point of each base.

The sides of the triangles measured 430m and the antenna was at an average height of 170m. To minimise the radiation resistance of the array, an extensive earth system, consisting of 80km (**yes...80,000 metres!**) of copper wire, was ploughed into the ground beneath.

Late in 1940, two additional l.w. transmitters, together with about 12 h.f. sets were planned. The extra l.w. sets were intended to cover a frequency range extending well above the very low frequency of the original l.w. equipment. Although **not strictly correct**, these additional l.w. sets were designated as 'medium wave' (m.w.) transmitters, to avoid confusion with the original equipment.

Originally the m.w. units were installed

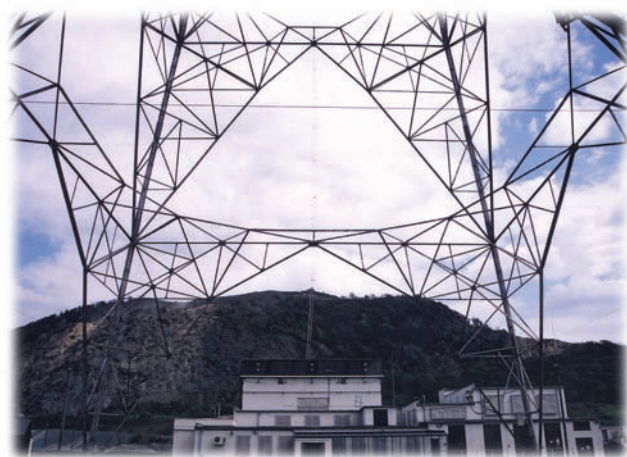
- Three additional stayed masts, each 215m in height, were erected in recent years to support the new antennas and the two hilltop anchorages were replaced by a single installation. The antenna is roughly triangular in shape, each side measuring just over one kilometre. It contains almost 22km of steel-cored aluminium cable and weighs 41 tonnes - hence the sturdy cables!



in a separate building, near the centre mast. The two associated antennas were suspended at a height of 138m, one across each of the two main mast spans.

When first installed the s.w. (h.f.) sets

- The l.w. building, with the Breidden Hill behind. Vertical antenna feeder in the centre.



were in two buildings some 800m apart and a number of rhombic antennas were erected near to each building. These were aligned so as to provide wide geographical coverage over a frequency band of 4-22MHz. A few dipole antennas were also provided for general broadcast use.

The output valves of the l.w. transmitter were cooled by a flow of de-ionised water, which passed through a heat exchanger. This would normally be cooled by a flow of river water but as the transmitter was not expected to be in frequent use, forced-air cooling was adopted.

Later, a pump house was installed on the river bank to provide secondary cooling water for the h.f. sets. The m.w. transmitters had silica-glass output valves, which were air cooled.

Operational Service

By March 1943, the l.w. antenna had been completed and transmitter

commissioning tests were well advanced. These tests had to be hurriedly completed when the GBR transmitter was put out of action on 30 March by a fire at the Rugby station.

Criggon then took over the Rugby service from 2 April, continuing until the Rugby station came back into use at the end of the year. Criggon's role then changed, with the l.w. unit going into regular service on a frequency of 14.46kHz, with the callsign GBZ. The two m.w. transmitters became operational in mid 1943 and the h.f. sets were all in service by about mid 1945.

Rather eerily, the GBZ signals could be heard clearly underneath the antenna with the



- An antenna feeder lead-out. The dummy owl deters roosting birds from receiving an unpleasant (and terminal) shock!

'naked ear'! This was because of the effect of magnetostriction on metal objects in the vicinity, such as gates and fences.

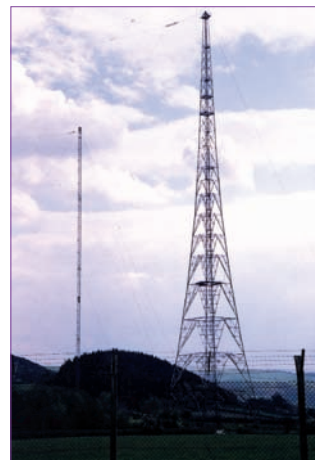
Radio equipment

The following notes give brief details of the radio equipment in use at Criggon during its early years. Transmitter output power is quoted as the d.c. power dissipated at the anodes of output valves.

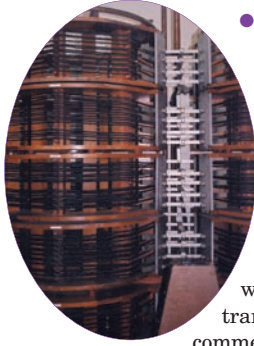
Long wave transmitter: This transmitter was designed and installed by PO staff and generated its carrier signal in a crystal oscillator, operating at either 14.46 or 16kHz. The oscillator was followed by a low power amplifier, where the set was keyed. This fed into an exciter stage consisting of two power amplifiers, the first rated at 2 kW and the second at 20kW.

The output of the exciter was coupled to the final stage, consisting of two panels each with 18 water-cooled valves in parallel. Each valve was rated at 10kW, giving an overall output rating of 360kW. The set transmitted Morse signals in a continuous-wave (c.w.) mode, typically at about 20 words per minute.

Medium wave transmitters: These two commercial sets also transmitted Morse signals in keyed c.w. mode. Each consisted of a valve master oscillator feeding into a low-power amplifier, where the set was keyed. This stage was followed by two Class-C power amplifiers, the second of which was coupled to the antenna. Both transmitters had output stages rated at 40kW and operated at frequencies within a



- Two masts, old style (185m) on the right and new (215m) on the left.



- The medium wave transmitter tuning coils at Criggion (see text).

band of 40-150kHz.

High frequency transmitters: The two s.w. (h.f.) buildings were of similar layout, each with five PO-designed transmitters and three commercial sets.

In each building, a rack of crystal-controlled oscillators supplied the appropriate fundamental carrier frequencies to the PO sets. The output of any oscillator could be connected to a harmonic generator (HG) stage in any of the five sets and the required transmitter frequency was selected at the HG output.

The carrier signal then passed on to an amplifier, where the keying of the set took place. In a few sets, this amplifier could be modulated by a multi-channel voice-frequency telegraph system or by speech. The amplifier output was then coupled to one of three types of power output stage.

Two sets in each building were designed so that the HG, amplifier and output stage were in the same cubicle. These sets operated in the single-sideband suppressed carrier (s.s.b.) mode, with a rated output of 40kW.

The other three PO sets in each building consisted of two separate cubicles, the first containing the HG, amplifier and a penultimate power stage rated at 20kW. This fed into a second cubicle containing the output stage, which used water-cooled, demountable valves. The output of one of these sets was rated at 120kW and the other two were rated at 200kW.

Each of the commercial sets was self-contained, with a relatively low power rating.

After The War

After the Second World War, the nature and volume of traffic through Criggion changed, reflecting a transfer from military to civilian use. But new technology was just around the corner!

The first transatlantic **telephone cable** came into use in 1956, providing 36 reliable speech circuits free from the noise and fading normally associated with h.f. radio. Cables of much greater capacity soon followed, especially between Europe and North America and this led to the demise of the traditional h.f. services.

All the h.f. sets at Criggion had been taken out of service by 1970 and the station then operated on l.w. only. As explained earlier, two of the transmitters were designated as m.w. sets although strictly speaking they weren't on long wave!

In 1967, the PO decided to modernise the l.w. set and to erect a larger and more efficient antenna for it. The proposed more efficient antenna was expected to quadruple the actual radiated power.

A new transmitter was also proposed

which would respond to the higher keying speeds of contemporary telegraph systems. It would also accept techniques such as frequency-shift keying.

The new transmitter and antenna were brought into use in July 1969, operating on a frequency of 19.6kHz, with the callsign GBZ, or on 16kHz as a reserve for the GBR service. The transmitter consists of a synthesiser-type frequency generator, driving three separate power-amplifier units.

Each unit contains an amplifier rated at 5kW, coupled to a single-stage tuned amplifier. This final stage is rated at 150kW on 19.6kHz and 100kW on 16kHz.

The three units are connected independently to a common antenna coupling circuit by means of heavy-duty



- The view from the Breidden Hill (a miniature mountain in many respects) anchorage point. The l.w. building in the foreground and m.w. building is behind the mast. The station is clearly visible from the main A5 Shrewsbury to Llangollen trunk route and although you might think your eyes deceive you, one end of the antenna is anchored to the mountain top!

radio frequency (r.f.) switches, giving maximum outputs of 450kW (GBZ) or 300kW (GBR). The output valves are vapour cooled, using a closed-circuit water system incorporating large fan-cooled radiators.

In its role as a reserve for the Rugby GBR service, Criggion is equipped to generate and transmit standard international time signals. This equipment, with its caesium atomic clock, provides the



- The long wave transmitter consoles at British Telecom International's Criggion transmitter (see text).

l.w. transmitter with a highly stable carrier frequency, for both the GBR and GBZ services.

Three Additional Masts

Three additional stayed masts, each 215m in height, were erected to support the new antennas and the two hilltop anchorages were replaced by a single installation. The antenna is roughly triangular in shape, each side measuring just over one kilometre. It contains almost 22km of steel-cored aluminium cable and weighs 41 tonnes.

In January 1983, the two original m.w. sets were replaced by commercial transmitters of more recent design. These operate over a similar frequency band to the original sets, with comparable output power.

A third m.w. transmitter, designed and installed by BT staff, was brought into service in 1991, with its own antenna. This operates over a frequency range of 64-130kHz.

The transmitter consists of a solid-state, Class-B drive amplifier feeding into one high-power tetrode output valve, rated at 20kW and air cooled. This transmitter derives its carrier frequency from a crystal oscillator and, in 1991, similar BT-designed crystal oscillators were fitted to the other two m.w. transmitters.

History & Acknowledgements

Much of the early history in this article has been gleaned from *PO Electrical Engineers Journals*. More recent information has been provided by the Station Manager at Criggion, who also read the draft manuscript. (PO Telephones became British Telecom in 1981 and the Criggion station now operates as part of BT International).

The photographs are by **David Williams** (my son!) thanks to the courtesy and co-operation of the Station Manager. Writing the article has brought back many memories of this fascinating station...and I hope you enjoy reading it as much as I did preparing it!

DW

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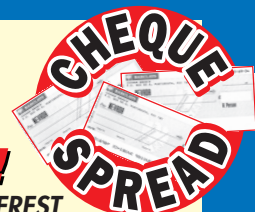


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“SGC have been very busy” says Rob Mannion G3XFD as he provides a brief report on the very latest version of their Smartuner - the SG-239, an update on their previous model - the 237 which was reviewed as recently as PW January 2001!

Ready to go...

The SG-239 Smartuner

When Jeff Stanton G6XYU of Waters & Stanton PLC returned from the 2001 Dayton HamVention and told me he'd soon have the latest mini SG-239 Smartuner I wondered “What else can they do with it?” - having reviewed the unit's predecessor the SG-237 (which - as the unscreened p.c.b. version is still available) in the January 2001 PW!

However, even though the updated '239 model has arrived here shortly after the '237 - there are some significant differences, some of which will appeal to QRP operators. With this in mind I thought it was worthwhile featuring the '239 in PW.

On seeing the SG-239 for the first time - the main visible difference is that the unit comes with a custom built aluminium casing, with the input, output and other control terminals very conveniently placed ready for use. This version of the Smartuner really is ready-to-go wherever you wish to use it!

Quieter & Quicker

Now that the p.c.b. version of the Smartuner comes with a fitted casing it also seems very much quieter in operation because of the screening effect of the case itself. The unit also seems to be quicker in tuning up - although to be honest this might be an impression rather than fact because I don't have the older SG-237 to compare it with (And the information in the usual excellent SGC manual doesn't mention it either!).

The screening case is - **very usefully** - marked with most of the operating conditions and requirements and it's also a very convenient 190 x 150 x 145mm (maximum measurements including protrusions) size. It actually sits in my large hand very comfortably!

Radio Frequency Screening

The aluminium casing also provides superb r.f. screening - proving well able to keep out nasty noises from my TV receiver and computer. It should also prove excellent for use in a mobile environment where it could be mounted securely out of view with confidence, knowing that it's unlikely to pick up r.f.i. from the vehicle.

Low Power Operations

The keen QRP enthusiast will find that this Smartuner will serve well for low power operations. In their specifications, and on the unit itself, SGC state that the '239 will operate with inputs around the 1.5W p.e.p. level - compared to the 3W p.e.p. input required by the '237.

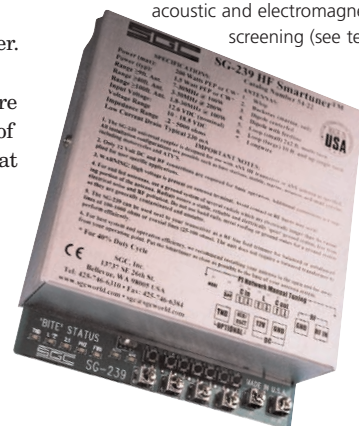
However, I successfully got the '239 to work with my 14MHz band 'Milliwatter' transmitter operating at approximately 400mW. At this level it tuned up very rapidly - and even when I changed bands to 28MHz (using my DX-70) the SG-239 matched up the 'vertical long wire' exceptionally quickly.

Using my favourite FTF fishing rod pole (In fact it was using the Picnic Pole portable station concept featured in the August PW) the unit fitted neatly inside and I worked several European stations and even managed one station in Boston! I was so pleased that I've decided to buy myself a SG-239 to fit in my new car which I will be getting in September as I intend to have a dedicated portable station for use in the vehicle. Although

more expensive than ordinary antenna tuners - the expense is outweighed by convenience for me!

PW

Fig. 1: The aluminium casing provides more than adequate acoustic and electromagnetic screening (see text).



Product

The SGC SG-239 automatic a.t.u.

Company: Waters & Stanton PLC

Contact: Sales

Tel: (01702) 206835

Pros & Cons

Pros: Ready to go, easy to use and quick-to-tune.

Cons: More expensive than a high quality manual a.t.u.

Summary

For minimum fuss portable operations I think you should consider the SGC-239!

Price

Cost: £249 plus P&P.

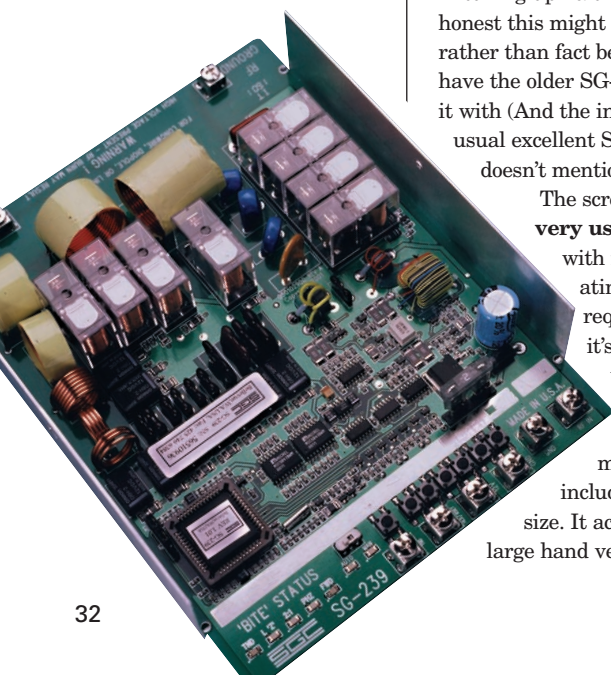
Thanks

My thanks for the loan of the unit go to Waters & Stanton PLC of 22 Main Road, Hockley, Essex SS54QS. Tel: (01702) 206835.

Brief Manufacturer's Specifications

Power input max:	200W p.e.p. or c.w. (40% duty cycle).
Power input minimum:	1.5W p.e.p. (see text).
Freq. range (9ft. antenna):	7-30MHz @ 100W
Freq. range (40ft antenna):	3-30MHz @ 200W
req. range (100ft antenna):	1.8-30MHz @ 100W
Operating voltage:	12.6V d.c. (nominal)
Impedance range:	0.2 to 5kΩ
Current consumption:	230mA (typical)
The SG-239 will work with whips, dipoles, large and small loops and long wire antennas.	

Presented in a compact form - the SGC Inc.'s SG-239 Smartuner is 'ready to go' and proved itself to G3XFD's pleasure.



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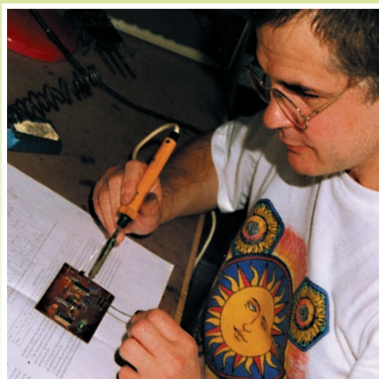
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Practical Circuit Board Construction

● Ian 'at-play' with a design under construction.

Ian Liston-Smith has a technique for producing circuit boards for his projects, that look like p.c.b.s, but doesn't use chemicals.

For many decades now the printed circuit board (p.c.b.) has replaced all other assembly methods in the manufacture of electronic goods. But for reasons I have never understood, radio and electronic hobbyists try to emulate this construction method. And why is this you may ask?

The p.c.b. was specifically designed for mass production and I think it is therefore singularly unsuited for the home constructor, unless of course it is provided as part of a kit. When the task of making an individual p.c.b. is well done, the enthusiast can obtain a professional finish.

Making a one-off p.c.b. is a method that is mostly time consuming, inflexible and requires the use of some often unpleasant chemicals. Fortunately various alternatives for creating p.c.b.s, are available in the form of copper strip matrix boards.

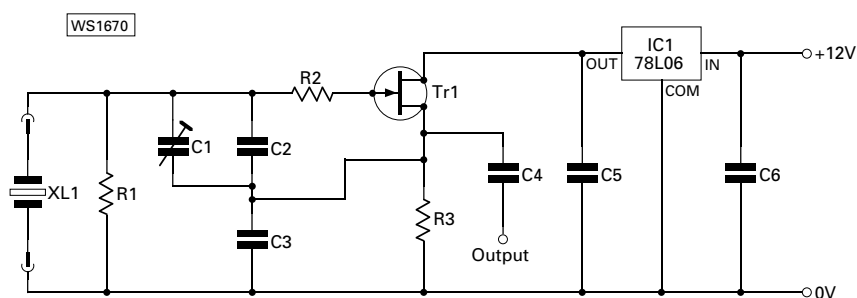
Matrix boards with fixed copper strips have two significant disadvantages. Often an awkward component layout is required. The resulting redesign of the layout, for anything other than a simple circuit, can take a considerable time to rework.

Many matrix boards are not generally suitable for circuits operating above medium frequency r.f. or the lowest of the h.f. Amateur bands, due to their lack of earth plane and stray capacitance between the strips or pads.

Dead-bug

The technique of construction, often called the 'dead-bug' (so called because of the look of some of the components) is another favoured construction alternative. This is a method that uses a single sided p.c.b. material board as the earth plane and 0V rail. (If you're

method the major components, such as integrated circuits (i.c.s) are glued to the copper clad material, which gave rise to the characteristic look of dead bugs with its legs in the air! The other components are soldered to each other or the copper earth plane.



● Fig. 1: A simple crystal oscillator circuit used to demonstrate the technique presented here.

The dead-bug method, favoured for many of the simpler projects, is ideal for prototyping. It's a method I often use, although I think it tends to look rather too messy for the finished project.

Island Matrix Technique

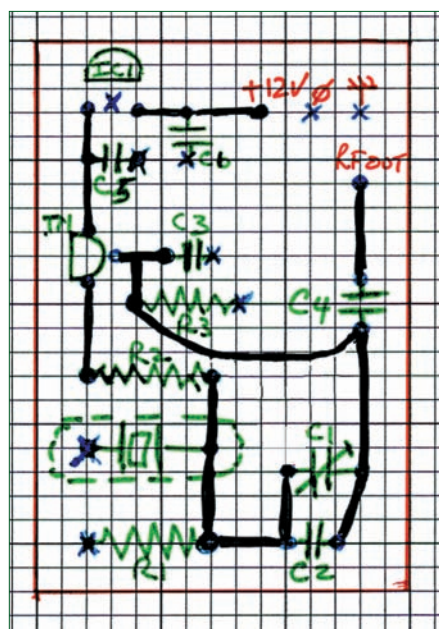
Another alternative method of construction is the 'island matrix'. This is another interesting method, using very small squares of board, cut out and glued onto a much bigger board of p.c.b. material.

However, the island technique doesn't provide a neat finished layout either. The capacitances formed between each of the islands and the main board also rule this system out for many r.f. projects, except those at the low end of the spectrum.

I was looking for another way - one that combines the ease of production of the other methods, but has a more professional finished look. The method described here is the one I have settled on. I doubt my method is original, but I now use it for all my projects.

In my method, the components are mounted on the upper side of single sided board and the leads pass through countersunk holes and are then wired up underneath. I'm sure that purists would say that this strictly speaking isn't a p.c.b. However, it combines the best of both worlds.

It's a system I have not seen described by anyone else (although years ago I did briefly describe it elsewhere). It's a method that is at least as easy as the alternatives with the following advantages:

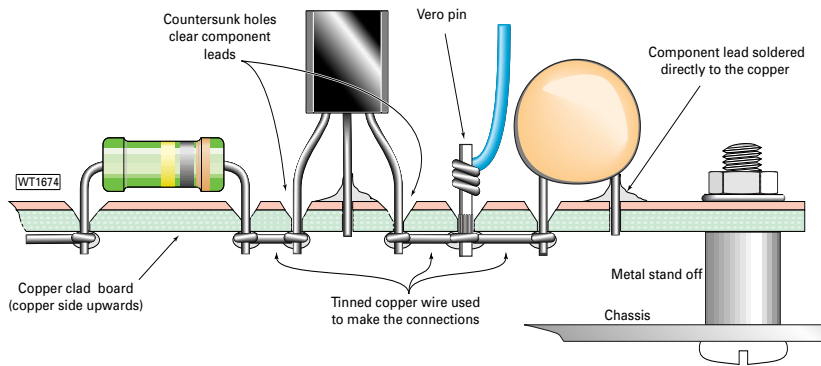


● Fig. 2: If there is no circuit layout in the magazine article, then sketch one out, on squared paper, as shown here.

still unsure, have look at many of the smaller projects produced by **George Dobbs G3RJV**. It's a method favoured by many other members of the **G-QRP club**. Editor)

In many instances, when using the dead-bug





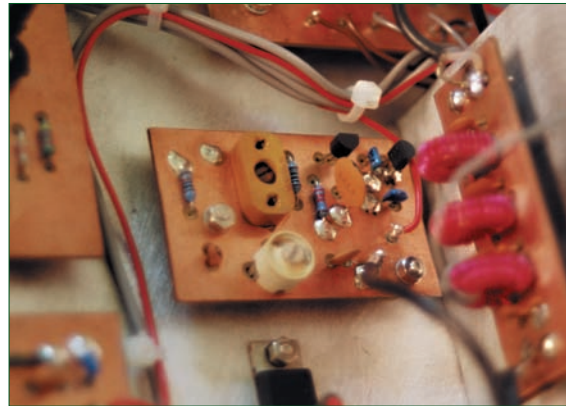
- Fig. 3: A cross section through a typical board design, just to illustrate the technique of linking components together.
- No etching chemicals are required.
- The upper copper side acts as the earth plane and this is particularly suited to r.f. circuits, although it works equally well for power supplies, audio, digital circuits etc.
- Suitable for the novice or experienced constructor.
- Can easily be modified to accommodate circuit alterations.
- The finished appearance is that of a real p.c.b.
- If a project has a p.c.b. layout, this can be used. The wiring underneath then follows the track design.

Crystal Oscillator

The example design described here shows how a crystal oscillator is constructed using this



● Fig. 6: The project of Fig. 5, but this time from below!



● Fig. 4: The finished board in place in the full project.

make sense to follow that layout, rather than redesign it for your board

The Method

Collect all the components for the circuit before starting so, that lead and component spacing can be worked out. This is done on 0.1 inch graph paper and drawn actual size as shown in Fig. 2. This paper is chosen because the spacing of most component leads are multiples of 0.1 inches.

The crosses in the layout represent earth points on the copper side of the board. When the paper layout is completed (allowing gaps between some components for the mounting screws), cut it out and tape it over a piece of board of the same size, copper side up.

With a centre punch or other sharp instrument, press hard enough to make a good indentation at all the points marked with dots. Using a one millimetre drill bit, drill right through the paper and board at these points.

Now press to mark all the X-points. These are the holes for the earthed component leads. Remove the paper without drilling these.

With a Verocutter or six millimetre diameter twist drill, countersink all the drilled holes. These are the holes the component leads must pass through without touching the copper surface.

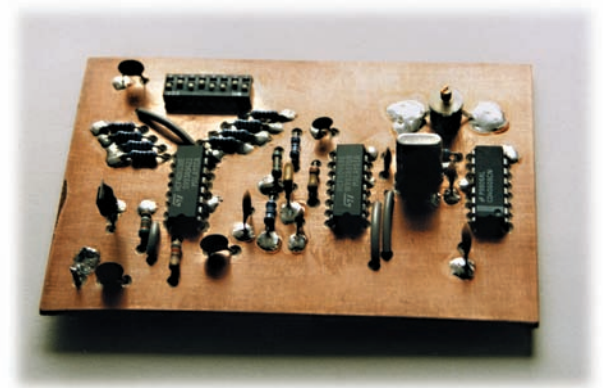
Now drill through all the X-points. Doing it in this order prevents the X-points from being accidentally countersunk.

There are likely to be minute pieces of copper around the countersunk holes that could short out components later. To clear these, rub the whole board with emery paper or coarse wire wool. This will smooth the holes and polish the copper ready for soldering.

Finally, to remove all the debris that will now have got pushed into the countersunk holes, gently go over them again with the Verocutter or six millimetre drill. The board is now ready for the components.

All components requiring an earthed connection have the appropriate lead soldered to the top as shown in Fig. 3. Veropins are used for test points and any flying leads. Tinned copper wire is used to connect the components together under the board. If the layout is cramped, slip an insulated sleeve over any wires running close to each other.

Drill holes for the M3 mounting bolts between the components. These will provide a good earth to the main chassis. The board is held above the chassis with plastic or metal spacers. As you can see from the



● Fig. 5: A rather more complicated layout from above...

photographs of finished item in Fig. 4, the end result is very neat and professional looking.

More Complicated

It's possible to create rather more complicated circuit layouts than the design I've chosen here to demonstrate the technique. A much more complex circuit using i.c.s and switches (see photographs) illustrate the flexibility of this assembly technique. Have a look at the photographs of Fig. 5 and Fig. 6 to see the design. I'm sure you'd agree that from the component side it's difficult to tell that it isn't a well made amateur p.c.b.

No one would know it wasn't a real p.c.b.!

pw

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Keep the postcards coming - and tell us about your holiday radio stories.
See you soon - Chris



MALTA
MOSTA DOME

Hi All,

Having a wonderful holiday and a big thankyou for recommending the Yaesu VX-5R. It just fits the bill, while the missus goes shopping. I can continue with my hobby. I'll show you the pics of me with my brilliant new radio when I get back! See you soon,
John

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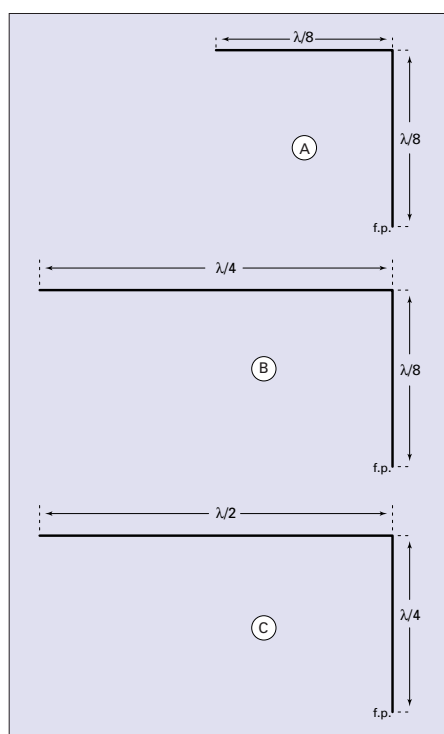
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Antenna Workshop

In one of his last articles, the late Joe Carr K4IPV explains that there is an antenna suited for use on the lower h.f. bands-and it will fit in most gardens!

● Fig. 2: Shown here are three variants of the 'second' type of Inverted L antenna, that Joe says are really versions of the type shown in Fig 1. See text for more detail.



Antennas for the 1.8, 3.5 and even the 7MHz bands tend to be problematical for a lot of Amateurs. Why? Because antennas for those bands require space that most Amateurs lack. For example, at the 1.8MHz band the half wavelength dipole is 79m long!

I don't have around 80m of space, and I doubt that most other Amateurs do either. Even for the 7MHz band, the full sized half wavelength antenna is nearly 20m long, which is often still too long for many gardens.

The answer for many Amateurs with small gardens would seem to be any form of Inverted-L antennas. There seems to be at least two types - well maybe just two and a half types if you insist!

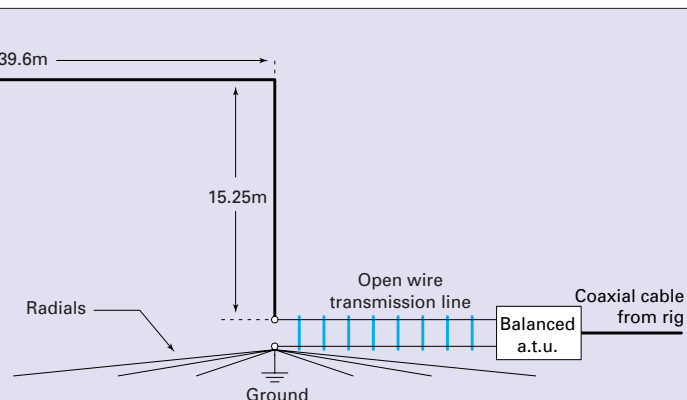
First Type

The first type of Inverted-L antenna that I'm about to describe is approximately $3\frac{1}{8}$ long. The antenna shown in **Fig. 1**, is for the 1.8MHz band, designed for 1.820MHz. Antennas for 3.5 and 7MHz can be made by frequency scaling the dimensions. That is, multiply the dimensions by $1.82/f(\text{MHz})$, where f is the new design frequency.

For example, to scale the dimensions for 3.75MHz, multiply by $1.82/3.75 = 0.485$. This means the horizontal section would be 19.21m and the vertical section is 7.4m. The antenna is fed by any length of 600Ω twin feed transmission line and an antenna tuning unit (a.t.u.). The high impedance at the bottom of the antenna is transformed, by the open wire feeder and a.t.u. to an impedance that your transmitter can handle.

Because this antenna has a high feed-point impedance, be careful of the type of a.t.u. that has a limited range line impedances. You need a good a.t.u. to match high impedance values to the output impedance of your rig (probably 50Ω). There is an advantage to use an older rig with a vacuum tube (valved) final power amplifier.

The inverted-L antenna requires a good ground system to work properly. For many Amateurs that means one or more long ground rod directly



underneath the vertical section, leaving only a short length for connection to one side of the antenna feedline.

In other cases, good grounding means a radial system. If the radials are buried, then they don't have to be resonant (although the wire should be bare!), although they should be as long as possible and trenched into the earth with a spade or shovel, but do not leave them on the surface (far too easy to trip up over).

The number of radials is simple: the more the better. In truth, about four radials seems a reasonable compromise, though above sixteen the return in extra far-field strength is minimal.

Second Type

The second type of inverted-L antenna is actually a variation on the theme of the first. I feel there are three varieties. The type shown in **Fig. 2a** is $\frac{1}{8}$ long for both vertical and horizontal legs. The type in **Fig. 2b** is $\frac{1}{4}$ long on the horizontal segment and $\frac{1}{8}$ long on the vertical. The type in **Fig. 2c** is $\frac{1}{2}$ long on the horizontal segment and $\frac{1}{4}$ long on the vertical.

Computer modelling of the type 2 antenna (**Fig. 2b**) showed that it had a gain of 1.5dBi (decibels over isotropic). Given that a dipole has a gain of about 2dBi, this antenna has a gain slightly less than a dipole in the horizontal aspect. The pattern peaked perpendicular to the horizontal line of the antenna.

The nice thing about this antenna is the 'free' band that one gets. For example, you can build an antenna for either the 1.8 and 3.5MHz, or for the 3.5 and 7MHz bands. The antenna has one current node at the lower frequency and two at the higher frequency.

The simplified diagram of **Fig. 3** shows the antenna impedance matching scheme for all three antenna types presented in this article. The transformer is bifilar wound, although with slightly different numbers of turns, on an FT-240-61, FT-240-43, or FT-200-2 core, or equivalent.

The primary winding is 16 turns 2mm (14s.w.g.) enamelled wire, and the secondary is 10 turns of the same wire. The secondary is tapped at the eighth turn from the feedline end. A series capacitor is needed on 3.5 and 1.8MHz, but rarely on 7MHz.

● Fig. 1: This design for 1.820MHz could fit in many gardens, but is easily scaled for higher bands. See text for more detail.

High Voltage

The capacitors can be a combination of high voltage, high current disk ceramic or similar capacitors, or they can be a single transmitting quality variable capacitor if some means is provided of varying the capacitance. In any event, the purpose of the capacitor is to cancel a significant amount of inductive reactance that appears in the impedance of about 100Ω (resistive).

After the correct amount of capacitive reactance is determined, perhaps by using a variable capacitor and then measuring its capacitance at the setting that drops the v.s.w.r. to minimum, a combination of several parallel disk ceramic capacitors can be substituted into the circuit. The correct capacitor is selected by a switch or relay (S1).

The important thing to remember is the voltage rating of the capacitors. For a 100W transceiver a voltage rating of about 1kV working is sufficient, but for higher power levels use 4kV working units instead. The capacitors also have to handle fairly high currents (1A at 100W and 4A at 1,500W), so select the units carefully.

Feedline v.s.w.r. can be handled by using a Q-matching section. By using quarter wavelength of 75Ω coaxial cable between the antenna tuner and the 50Ω coaxial cable to the transmitter, one can reduce the 100Ω feed-point impedance to a manageable v.s.w.r. Of course, this approach must be repeated on each band of operation, because the quarter-wave 'Q-section' is inherently frequency dependent.

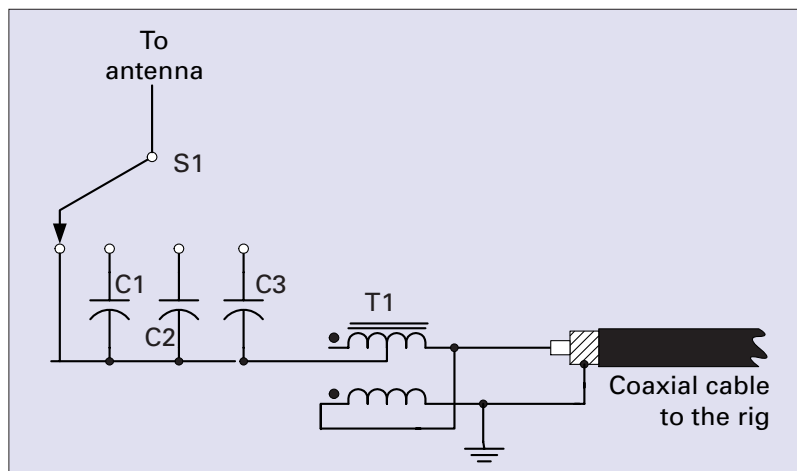
Operation on 1.8MHz might require an inductor in series with the antenna. Try an 18μH adjustable or roller inductor for use in this type of situation. This coil is used with the capacitors bypassed.

Third Version

The third version of the inverted-L antenna shown here is intended for use where you have vertical height, but lack the space to put in a full size antenna and/or a system of radials. All of the methods at making a compromise antenna (e.g. inductors in the radiators) tend to narrow band the antenna by raising its Q. The antenna shown in **Fig. 4** doesn't suffer the indignity of a narrower bandwidth. In addition, the antenna has both high angle and low angle of radiation.

The antenna shown in Fig. 4 is a $\frac{1}{2}$ dipole with one radiator element vertical and the other horizontal. The feed-point of the 'bent-L' antenna, like all $\frac{1}{2}$ dipoles, is in the centre, is closer to 50Ω than 73Ω because of coupling between the elements. The antenna has an s.w.r. of less than 3:1 across the 3.5MHz band, and less than 1.8:1 across the 7MHz band.

In tests conducted by **W2KK** back in the 1970s, a bent-L dipole performed a little down on a simple dipole at around -2dBd. However, the inverted-L antenna beat a $\frac{1}{4}$ vertical monopole without radials (-10dBd), a $\frac{1}{4}$ vertical with radials (-8dBd), an inverted-V (-3dBd) and a $\frac{1}{2}$



vertical (-15dBd) antenna types.

In my view, these tests fail to take into account angle of radiation, but they are none the less significant. The gain of the antenna is slightly less than that of the regular horizontal or vertical dipole, but not so much that you would notice it.

The length of the elements is slightly less than the lengths of ordinary half wavelength dipoles. Each element (vertical and horizontal) is found from the formula: $132/f$, where: the element length is in metres and the frequency in megahertz.

If the layout of your property doesn't allow the antenna to be run in straight lines, then bend one or both elements as needed. The overall length of the resultant antenna should still be $(132/f)m$, even though the elements are not particularly straight.

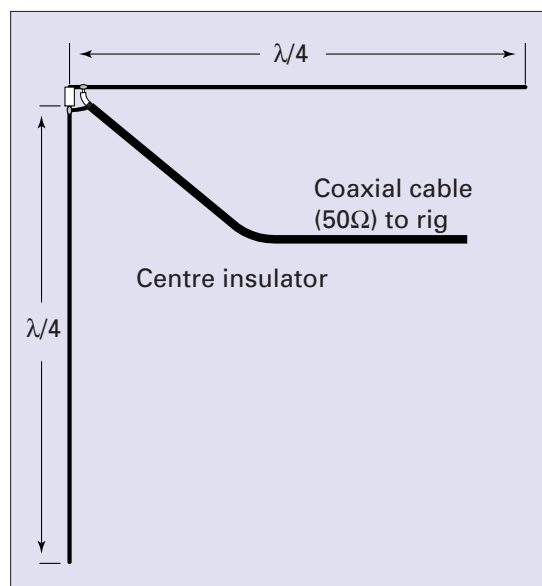
Bending the upper section results in lower gain most of the time, because it distorts the pattern of the antenna considerably. This principal is little understood amongst antenna builders: if the result is inability to operate at all, go for a compensation antenna and accept the results, it's better than not being able to operate at all.

Splendid Antenna

I've come to the conclusion that the Inverted-L antenna is a splendid antenna for those who want to work the 1.8, 3.5 and 7MHz amateur radio bands, but lack the garden space to do so. The antenna is a compromise to be sure, so they typically have less gain than a standard half wavelength dipole antenna.

The reduced gain of this antenna is essentially a non-issue when the result of not using such an antenna is...radio silence!

● Fig. 3: A simple antenna tuning unit uses series capacitors to tune the antenna inductance to the centre of the band of interest. Each capacitance value is chosen to give a low s.w.r. then replaced with fixed value, high voltage compents. See text for more detail.



● Fig. 4: The final type of Inverted L, like a dipole is fed at its centre point rather than at the lowest point. Cut for the band of interest, it matches quite well to a 50Ω coaxial line. See text for more detail.

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The Kenwood TS-50S Comp

Richard Newton G0RSN takes a look at a modern transceiver that's very quickly become a classic. It's also the choice for the International Beacon Project's automatic transmissions where it's used 24 hours a day!

Following in the footsteps of The **Rev. George Dobbs G3RJV** is a daunting prospect! This is just what I had to do when asked to review the Kenwood TS-50S compact h.f. Transceiver. The Kenwood TS-50 was originally reviewed in *PW* back June 1993 by G3RJV when it was introduced and a market leader. Since then it's seen stiff opposition from newer transceivers but is still alive and kicking!

I enjoyed owning an TS-50 myself very much indeed and have always admired it as one of the very first compact h.f. rigs. So, having accepted the commission - I was looking forward to working on this review as it was going to be like revisiting an old friend.

Simple & Comfortable

The simple and uncluttered design of the radio was appealing. Being almost exclusively menu driven and controlled, the transceiver is not dripping with controls.

At first sight the TS-50S has a comfortably unimposing look about it. On closer examination you soon find that the basic-looking exterior belies the truth of a feature-packed interior.

The TS-50S is an 1.8 to 30MHz multi-mode h.f. transceiver measuring 180 x 69 x 270mm (including

protrusions) and weighing in at about 2.9kg (6.4lbs). It also offers general coverage receive from 500kHz to 30MHz.

On the air the TS-50S can be used in c.w., a.m., s.s.b., or narrow band f.m. (n.b.f.m.) modes at power outputs between 10, 50 or 100W. In a.m. the output power choices are 5.5, 17 or 25W.

The size and weight and the fact it runs from 13.8V d.c. makes the TS-50S ideal for mobile or portable work. However, it does not have a detachable control panel; this is a significant hurdle when looking at installing it into some of the more modern automobiles.

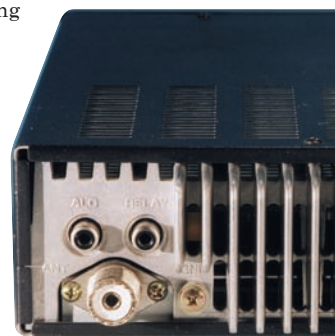
Mounted on the front panel there's a large tuning dial that can be friction-braked to suit the operator and operating conditions. I found this particularly useful when operating the radio mobile (which I did a great deal with my own TS-50), allowing tuning but preventing the vibration of the vehicle detuning the radio.

Also on the front panel there's a now somewhat old-fashioned 8-pin microphone connector. However, I still prefer these to the modular type, as it allows for easier home-brewing 'hands free' microphones. This type of plug also provides pin-outs to allow packet and other data modes with the relevant bits of hardware and software such as a Terminal Node Controller (TNC) for packet operations.

The TS-50S microphone itself is of very good quality. It incorporates four user-defined function buttons that can be set up as short cuts to menu features.

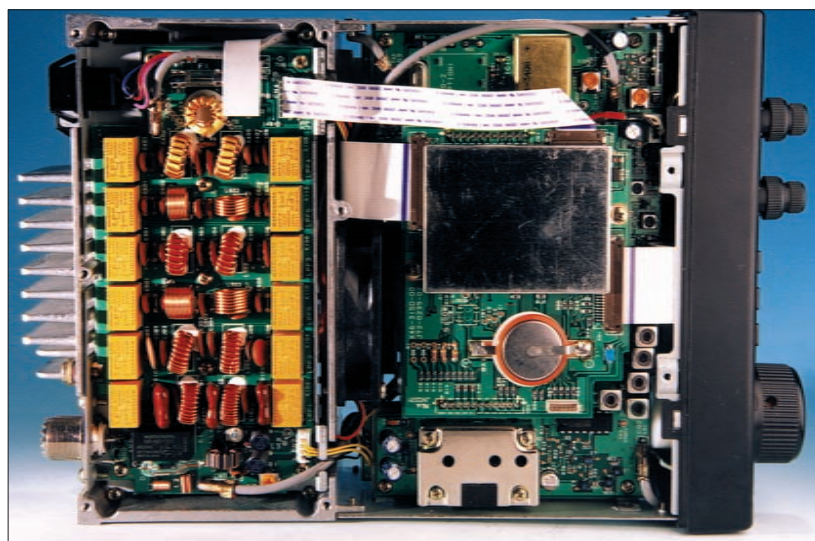
The **Volume**, **Squelch**, **RIT** and **IF Shift** controls are also present of course. But I won't list them one after the other... suffice to say that all the front panel controls are relevant and easily accessible!

The main display is large, well set out and



● Rear panel view of the extremely reliable TS-50S. Richard G0RSN - along with many others - also comments on the transceiver's excellent audio (see text).

● Richard G0RSN says there's a great number of facilities packed into the TS-50S transceiver.



Classic!

act HF Transceiver

pleasantly backlit. There are **Transmit** and **Automatic Tune** indicators should you be using one of the optional automatic antenna tuning units (a.a.t.u.s) units available to match the TS-50S.

One thing that's not available on the front panel that I would have liked to see there was **Output Power** selection. However, this is one of the factory defaults of one of the four programmable function keys on the supplied microphone.

The rear panel houses the SO239 50Ω antenna socket, power connector and grounding terminal. There's also sockets for accessories such as linear amplifiers, a.a.t.u., c.w. key and extension speaker.

Fuzzy Logic

The TS-50 is equipped with what Kenwood term fuzzy logic tuning. This features enables the transceiver to select the tuning steps based on the speed that the operator turns the dial: fast turning provides large steps, and slow tuning invokes small steps.

Other features include **AIP** and **ATT** and these acronyms denote the **Automatic Intercept Point** and **Attenuator**. They can be used independently or even together to help reduce distortion from a very strong signal or interference being suffered from a strong station on an adjacent channel. The two - when used together - are very useful when coping with a busy and noisy band such as the 7MHz band.

Difficult Contact?

The Kenwood TS-50S incorporates several features to help in difficult conditions. The first would be the use of the well known RIT control. The RIT on the TS-50 allows you to go $\pm 1.1\text{kHz}$ in 10Hz steps which can be changed in the menu set-up to provide $\pm 2.2\text{kHz}$ in 20Hz steps.

The most helpful feature is the i.f. shift which functions in s.s.b. or c.w. modes. It allows the operator to shift the i.f. filter pass-band without changing the receive frequency. It's **extremely useful** when a strong signal on an adjacent channel. Used in conjunction with the attenuator and or AIP functions I've found this to be an excellent tool. There's also Noise Blanker, designed to reduce pulse noise such as from car ignition.

As supplied the Kenwood TS-50S uses a 2.4kHz i.f. filter for s.s.b. and c.w. An optional 500Hz filter can be easily installed for c.w. When using a.m. the standard filter bandwidth 6kHz, although the radio



can be set for use the 2.4kHz s.s.b. filter on a.m.

One TS-50S feature deserves a special mention and comes into play when a new mode is selected. For example - on switching from l.s.b. to u.s.b. the first letter of the selected mode is heard in Morse code from the speaker. A Morse L for l.s.b., a U for u.s.b., an A for a.m. and so on. Very helpful!

Transceiver Memories

The transceiver has 100 memories and 99 can be used to store simplex or duplex frequencies. The one memory left can be used to store a simplex frequency or the start and finish frequencies used for the **Programme Scan** feature.

The memories can hold modulation mode, filter bandwidth, AIP and attenuator settings the automatic gain control setting and CTCSS Tone used for access to n.b.f.m. repeaters on the 28MHz band. These memories can be locked out as and when required.

Once a memory is selected the radio gives the flexibility to temporarily change the operating mode, the filter bandwidth or any of the other settings. The operator can even set the transceiver to tune away from the memories frequency.

When that memory is recalled, the original settings will remained unchanged. Memory settings can also be easily transferred to either of the two v.f.o.s provided.

Memories can be scanned as a whole or divided into groups of ten, or the programme scan can be used to scan all frequencies between two preset frequencies. Very useful for 7MHz mobile! The rig can be set to stop on a busy frequency and remain there until the carrier drops or only remain for a short while and then move on.

Early Shift DX!

When I owned a Kenwood TS-50S I was working early shifts and travelled about 30km every day. I has regular mobile contacts with Australia and New Zealand using a mono band mobile whip for 7MHz, what a buzz!

The one thing that struck me about the TS-50S was the wonderful audio both on transmit and receive. It still remains one of the best I have ever heard.

● A modern classic - the Kenwood TS-50S compact h.f. transceiver. Richard GORSN - who owned one himself - says he thoroughly enjoyed using the transceiver again.



It's A Modern Classic!

The Kenwood TS-50S Compact HF Transceiver



Richard Newton (right) chatting to Richard Newton (left) at a radio rally. Richard GORSN shares the fun of operating the TS-50S with Richard G0EWH at the Longleat rally in late June 2001.

(Photo courtesy of Terry Wood G7VJJ).



Terry Wood G7VJJ (left) joins son-in-law Richard GORSN with namesake Richard G0EWH under the caravan awning while mother-in-law Barbara takes the photograph!

Summary

The TS-50S oozes professionalism and style, the quality of the audio and general performance is second to none. My thanks go to **Kenwood Electronics UK, Kenwood House, Dwight Road, Watford, Hertfordshire** for the chance to relive my pleasure on the bands with this modern classic transceiver.

During my trip down memory lane I remembered my friend **Eddy Meekers G4SNR** who'd bought a TS-50S around the same time as me and to my knowledge still owned it, so I called him on the telephone. Eddy is a great guy and was more than happy to share his now considerable knowledge of the TS-50 with me.

Eddy bought his TS-50 brand new in the early 1990s and used it extensively in his camper van with ProAm mobile whips. More recently he's used a Texas Bug Catcher and was pleased to tell me that the whole set up works "extremely well"!

Over the years Eddy has literally worked the world using his Kenwood TS-50S including South Korea, Australia, Jerusalem, Florida, St Helena and Zimbabwe. He's worked most of his DX on

14MHz and uses 7MHz extensively for inter-G working. He says "The world is your oyster with a TS-50"!and I agree with him.

However, I then asked him that if he were able to change anything on the TS-50S, what would it be? Answering

Eddy told me that he would like to have had a r.f. gain facility. A detachable head would be useful, but Eddy has the quick slide mount for the TS-50 and has never found the lack of a de-mountable head to be a huge disadvantage.

Asked what he considered to be the best on the TS-50S. There was no hesitation in Eddy's reply: "The excellent audio" he said. I agreed, as we discussed how time and time again stations worked complimented us on the audio quality of the transmission.

Eddy concluded by saying the radio is "extremely rugged" and his final tribute was that the TS-50S gives a "Big radio feel on a small radio in size...and it has been well worth the money"!

On Air Trials

For my up-to-date on air trials I decided to do so when caravanning at the radio rally on the Longleat estate in Wiltshire at the end of June. I had help setting up from my father-in-law **Terry Wood G7VJJ** and we strung up our well-used simple 14MHz dipole cut for 14MHz. This was strung between two trees and was almost enveloped

in the branches, hardly ideal but we made the best of it.

Just before we went on air **Richard Newton G0EWH** - another original? - joined us! I had worked him and here he was in person. So both Richard and I put the TS-50S through its paces and Terry took some snaps.

The bands were deadly quiet, we tuned up and down the 14MHz band and nothing was heard until we were knocked off our camping stools by a massive signal, it was **Don Kitson G3TRK** on 14.218MHz operating a Icom IC-706 MkIIIG from Longleat! We had a short chat, what DX...we were only about 150m apart!

We then popped over and had a face-to-face chat with Don, I mention this because he showed us a wonderful h.f. vertical antenna he'd constructed from a ultra light-weight telescopic rod used for flying kites, some wire and a couple of coaxial cable plugs. It was fabulous and had cost less than £20! Don was happy to share his idea, so you never know we might see it in *PW* eventually.

It was then back to work with the Kenwood TS-50S and the bands seemed a little brighter. We worked **Vlad EN1WJP** in Lviv in The Ukraine who was running a Special Event station to mark the Pope's visit. Vlad gave us a 5 and 9 report.

Next contact was with **Mario Bottino I1KUE** in Italy, we had a very pleasant contact with Mario who said, "you have very good modulation" and asked what rig we were using. When we told him...his reply was "Excellent rig"! and complimented us once again on the audio quality of our signal.

Our last contact was with **John Brandhuber G4PDY** who was actually operating **ES/G4PDY/P**. John was on holiday on the Island of Saaremaa just off the Estonian coast, 4km north east of the town of Leisi.

John was using an Alinco DX-70 and gave us a report of 5 and 6 to 5 and 7. We chatted with him until we lost contact with him due to the path gently fading away. Hope you had a great holiday John and thanks for a super contact!

Great Fun!

Richard, Terry and I had great fun with the TS-50S and we all commented on the received audio quality as **it's very good indeed**. I very much enjoyed my trip down memory lane in the company of the Kenwood TS-50S.

Another testimony to the rugged reliability and overall performance of The Kenwood TS-50S is the fact that it's the standard radio used as part of the International Beacon project (details of which can be found in *PW* January 1999). In this application the 18 beacon transmitters operate for 24 hours a day - surely a tribute to a great transceiver!

The Kenwood TS-50S has captured the hearts and earned the respect of many operators worldwide. It's still available new and will offer stirring service as either a mobile or portable rig or as a base station attached to a main station antenna.

In my opinion the Kenwood TS-50S is one of, if not the finest, compact h.f. rigs you can buy. What it loses in the absence of a detachable head and the choice of v.h.f./u.h.f. bands it more than makes up for in sheer quality and reliability of service.

PW



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Sony ICF-2001D Portable SSB/AM with HF & VHF Airband 32ch.....	£299
Sony ICF-SW1000T Portable Receiver + FM stereo & SSB	
+ Cassette.....	£499
Sony ICF-SW7600D Portable Receiver with FM stereo and SSB.....	£799
Sony WA-8000 Portable Receiver with FM stereo + Cassette.....	£199
Taiting TMR-7602 Portable Receiver with FM stereo and SSB.....	£199
Trio R-600 "150kHz-30MHz AM,SSB,CW Receiver Mains".....	£175
SCANNERS MOBILE/BASE	
AOR AR-2001 "25-50MHz AM/FM,WFM 20Ch. 12V".....	£145
AOR AR-3000 100kHz-2036MHz All Mode Receiver 400ch. 12V.....	£449
AOR AR-3000A x2 100kHz-2036MHz All Mode 400ch. 12V.....	£459
with PSU.....	£59
Cobra SR-925 "29-512MHz (with gaps) AM/FM 16ch. 12V".....	£59
SCANNERS HAND HELD	
Fairmate HP-2000 "0.5-1300MHz AM/FM,WFM 1000ch".....	£115
Sony ICF-Pro80 "150kHz-108MHz,115.15-223MHz AM/FM & SSB".....	£199
Welz WS-1000 "500kHz-1300MHz AM/FM,WFM 400ch".....	£89
Yasu VR-500 100kHz-1300MHz All Mode Receiver 1000ch.....	£179
Yupiteru MVT-3500 "66-100MHz (with gaps) AM/FM 200Ch.....	£399
Yupiteru VT-225 "108-142,150-160,220-391MHz AM/FM 100Ch".....	£145
STATION ACCESSORIES	
AKD WA-1 120-450MHz VHF Wavemeter.....	£25
BNOS CLX432-150 "70cm Linear Amp 10W in, 50W out".....	£99
BNOS LPM-144-3-100 "2m Linear Amp 3W in, 100W out with	
Preamp".....	£139
BNOS LPM432-150 "70cm Linear Amp 1W in, 50W out with	
Preamp".....	£99
Datong ANF CW Automatic Noise Filter.....	£69
Heatherlie Explorer 2m Valve 350W out Linear amplifier.....	£499
Icom SP-20 x2 Matching Extension Speaker + Audio Filters.....	£109
KS FAX-1 "Weather Fax, NAVTEX, RTTY Decoder".....	£125
Jin M-100 24 2150MHz Low Noise GaAs FET Preamp.....	£69
JPS NTR-1 x2 DSP Noise Reducer.....	£99
Kantronics KPC-3+ Packet TNC + WEFAX.....	£109
Kent KMK Morse Keyer.....	£35
Kent Straight Brass Straight Morse Key on Wood Base.....	£35
Kenwood LF-30A HF 1KW Low Pass Filter.....	£29
Kenwood PS-50 12V 20A Matching PSU.....	£149
Kenwood PS-430 13.8V 20A Matching PSU.....	£129
Kenwood VC-HI "Visual Communicator/Colour LCD, SSTV".....	£175
Lowe PR-150 HF RX Preselector for HF-150 (P Sale).....	£149
MFJ MFJ-493 Menu Driven Menu Keyer + Keyboard Input.....	£99
MFJ MFJ-498 Deluxe Morse Keyboard Keyer.....	£129
MFJ MFJ-986 Shortwave Preselector.....	£25
MFJ MFJ-971 "1.8-30MHz SWR/PWR meter 200W".....	£59
MFJ MFJ-1020B 0-30MHz Indoor Active SWL Antenna.....	£65
MFJ MFJ-1270C "VHF-HF Packet TNC".....	£79
MFJ MFJ-1610 Theory Tutor (Novice).....	£4
Microna 21-522 3-30MHz SWR/PWR Modulation meter 0-500W.....	£10
Microset PT-107A 12V Stabilized 7A PSU.....	£39
MModules MML-144-30-LS 2m 1-3W in, 30W out Linear	
with Preamp.....	£69
MModules MML-432-30-L "70cm 1-3W in, 30W out Linear with	
Preamp".....	£120
MModules MML-432-50-10 "70cm 10-15W in, 50W out Linear with	
Preamp".....	£90
Opto 2600HA 1MHz-2GHz Frequency Counter.....	£79
Opto Micro-HF Pager sized micro HF Detector.....	£69
Opto Model 40 Scout 10MHz-1.4GHz Freq Counter.....	£225
Ramsay W9GR DSP Audio Filter.....	£119
Sadella Bravo Pro CB Base Desk Microphone + Pre-amp.....	£50
Sony AN-1 Active Shortwave Indoor Antenna.....	£49
SSB LT-23S 23cm Transverter IF 2m 10W out.....	£499
Tono THETA-550 RTTY & CW Decoder + Monitor output.....	£75
Toyto YM-1X 3.5-150MHz SWR / Power Meter.....	£10
Watson W-420 118-500MHz SWR/PWR meter 200W.....	£35
Yasu HF-232C CAT Interface Unit.....	£49
Yasu FL-7025 70cm clip-on 25W Linear (for FT-790R II).....	£119

Carrying On The Practical Way

This month - after the usual quotation - the Rev. George Dobbs G3RJV describes a 'Gutless Superhet'. George says it's "Direct conversion to Superhet in one easy lesson". Read on to find out more!

"Nothing is particularly hard if you divide it into small jobs."

Henry Ford (1863 - 1947)

I remember well building my first superhet receiver and my guess is that it was in 1959. Old timers, with a tear in the corner of their eye, would say that was in the real era of radio construction!

Well... it certainly was in the valve era and construction was a much more arduous task with real manual labour. I had built many short wave receivers which until then, had all been variations of the regenerative receiver. The direct conversion receiver was, at that time to re-appear and become popular again in the 1970s.

At last, by saving money from my paper round, I succeeded in gathering the bits to build an 'all-wave' superhet. I recall - at least I think I do - that the design came from *Practical Wireless*.



● Heading Photograph The Rev. George Dobbs G3RJV produces a Sudden conversion! However, he's not adding to his congregation - but instead explains how you can change the original Sudden DC receiver into a simple 'Gutless Wonder' superhet.

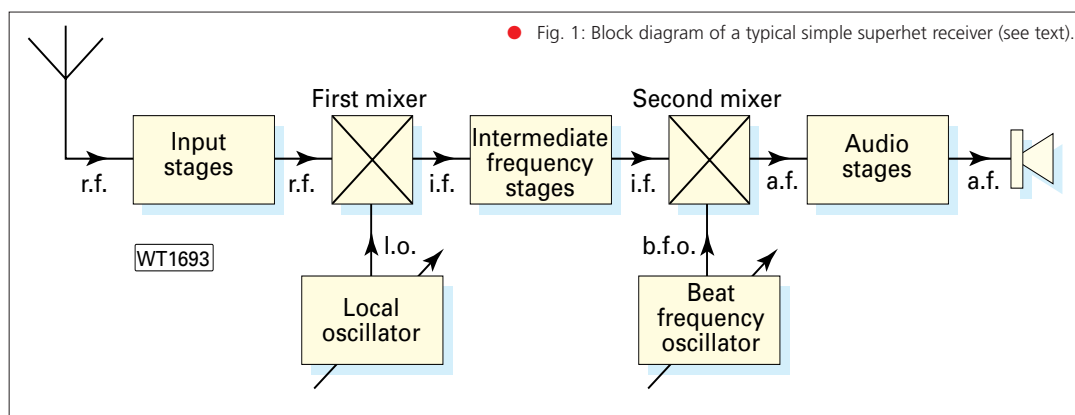
Built A Superhet?

Most readers of this column will probably have built a simple direct conversion (DC) receiver and some of you may never have built a superhet. Yet the difference is really very little. A superhet is like two direct conversion receivers in line.

The illustration, **Fig. 1**, shows the block diagram for a typical superhet receiver. So, let's now quickly follow the signal flow pathway.

In the design shown the radio signal from the antenna is processed in the **Input Stages**. These will be input tuned circuits for the desired frequency and may also include some amplification.

The tuned signal passes into the **First Mixer** where it's mixed with the signal from a **Local Oscillator**. This



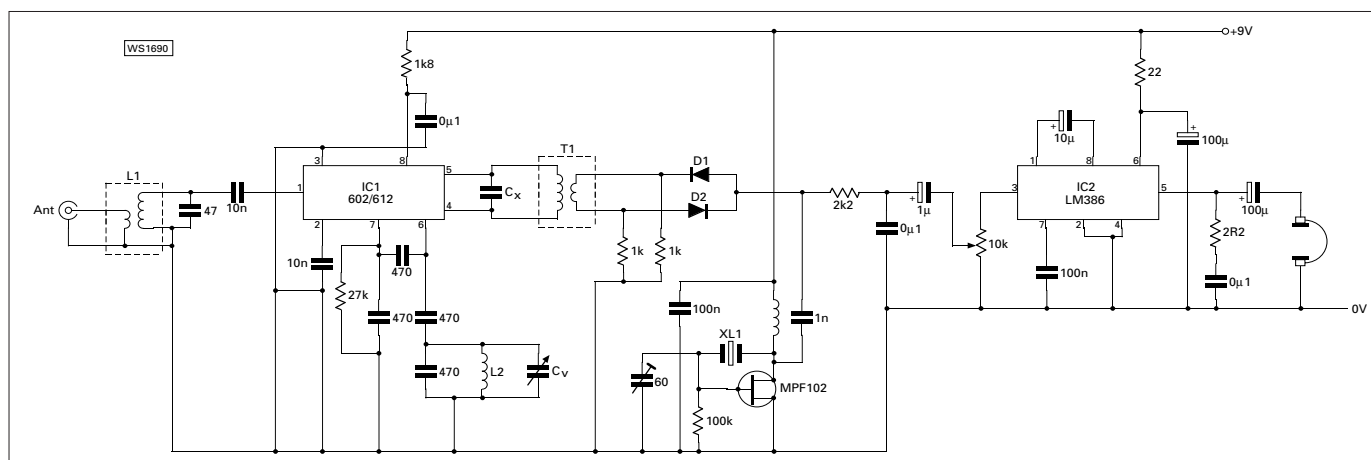
● Fig. 1: Block diagram of a typical simple superhet receiver (see text).

● Fig. 2: A very simple superhet receiver that's really a direct conversion (DC) receiver with the i.f. section, second mixer and b.f.o. added (see text).

The chassis work and the mounting of the i.f. transformers was done in the garden shed and the wiring completed on the old table in my bedroom. It took an age to align and adjust the tracking, but the finished job represented a leap ahead in my radio construction history. Life is much easier these days - thankfully!

is a variable oscillator whose frequency is **offset in frequency from the desired (tuned) radio frequency** - above or below it - by the **Intermediate Frequency (i.f.)**.

In practice the result of mixing is that the required signal, at whatever the original frequency, can be extracted at the i.f. This enables further processing to be



done in the i.f. stages. It also has the advantage that filtering and further amplification can all occur at a fixed frequency.

The processed signal passes to a **Second Mixer** where it's further mixed with a signal from the **Beat Frequency Oscillator** (b.f.o.). In operation the b.f.o. frequency is offset from the i.f. by a desired audio frequency (typically 800Hz) so that an audio tone can be derived to read Morse or single-sideband signals.

The resultant audio signals are then amplified to a listening level. The whole process is really quite simple! Instead of the single conversion from radio to audio signals as in the direct conversion

version of the Sudden receiver and based around the NE602 oscillator/mixer chip. Although the NE602 is now difficult to obtain it can be replaced by the readily available SA602 which has the same pin-out and functions.

The input tuning has been reduced to a single stage although the double bandpass tuned stage of the Sudden could be retained with advantage. The Toko 10K range of commercial coils were used in my version of the receiver but home-wound inductors could be used.

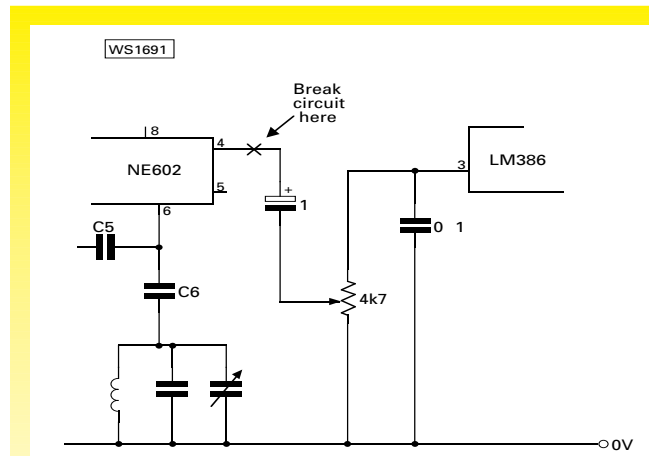
Additionally, the values in the local oscillator (l.o.) have also been simplified and, again, a Toko inductor is used for the tuning.

local oscillator adjusted accordingly.

If a resonator is not available, any 455kHz oscillator (with plenty of output) will serve the purpose. There are many circuits around for 455kHz oscillators to add a b.f.o. to short-wave a.m. only receivers. Many of these use another i.f. transformer for the oscillator and I described one such circuit in this column in May 1997.

A resistor and capacitor decouple the audio signal from the second mixer. This design is nothing...if not simple! The ever

● Fig. 3: Circuit diagram showing how an 80 metre band can suddenly become a superhet (see text).



● Fig. 3(a): The modification necessary enabling the Sudden DC receiver to become a simple superhet (see text).

receiver- two conversions take place to allow for i.f. stages. Knock out the i.f. stages, second mixer and b.f.o. and we are looking at a DC receiver. Not only that....the stages we've knocked out also look like another direct conversion receiver!

Simple Superhet

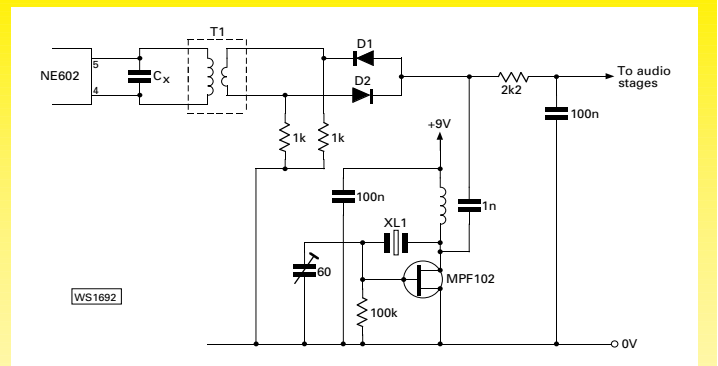
Now with the preliminaries over we can get down to it! The diagram, **Fig. 2**, shows a very simple superhet receiver that's really a DC receiver with the i.f. section, second mixer and b.f.o. added.

I've called the project a Gutless Wonder superhet. This is because the i.f. section is just another simple conversion to any additional amplification or signal processing. Astute readers will recognise the framework of the Sudden receiver in the circuit of Fig. 2. They're quite correct for this is a stripped down Sudden receiver with an intermediate frequency.

The chosen i.f. is 455kHz because this is a common choice in commercial medium and long wave receivers and components are easy to obtain. To avoid a big jump in conversion frequency, the receiver is for 80 metre band (3.5 to 3.7MHz). A lower frequency receiver is also easier to build in terms of variable local oscillator stability.

The Circuit

So, let's now follow the circuit in Fig. 2. The first mixer and local oscillator are a simplified



● Fig. 3(b): The portion of Fig. 2. which is required for the conversion of the Sudden to a superhet. These are the i.f. transformer, mixer and b.f.o.. They could be built on a small board mounted on the Sudden p.c.b. (see text).

The l.o. is a Colpitts type built around the internal oscillator of the NE602, which is accessed from pins 6 and 7.

In my version I used a rather inadequate polyvaricon variable capacitor for the tuning. A better choice is a good quality air spaced variable capacitor of some 50 to 60pF.

Since the i.f. is 455kHz, the required tuning range of the local oscillator is 3.045MHz upwards. This is easy to obtain using the Sudden 80 metre band values for the oscillator and adjusting the range with the core of the inductor.

The NE602 has a balanced output at pins 4 and 5 and these are connected directly to a 455kHz i.f. transformer (T1). These are common surplus items and the final i.f. transformer works best in this circuit. It will have more turns on the link winding.

A suitable commercial coil is the Toko YHCS11100AC2. The thrifter constructor will cull a suitable coil from an old medium wave receiver. Incidentally, Cx is the internal capacitor, which tunes T1 to 455kHz.

The link winding feeds direct to the second mixer which is a pair of diodes, balanced with two resistors. I used a pair of Schottky diodes (surplus unmarked ones) but a pair of Germanium diodes would do a good job (OA91, etc.).

The b.f.o. is a simple 455kHz oscillator based on a 455kHz ceramic resonator. These are common items and easy to use. The circuit is a simple, sure fire, crystal oscillator using the resonator in place of a crystal. In practice the trimmer helps to pull the oscillator on to frequency although this isn't too critical as the i.f. can be slightly away from 455kHz and the

familiar - and conveniently inexpensive - LM386 audio amplifier chip then amplifies the signal.

The resultant receiver is surprisingly better than its direct conversion parent. The 'shadow' signal on the other sideband is removed and the selectivity appears somewhat better. For a few extra components I think that the superhet version is worth building.

Sudden Conversion

If you already own a Sudden receiver for 3.5MHz, you may wish to convert it to a superhet. The Sudden first appeared in *Sprat*, the journal of the G QRP Club, then in *PW* and has been sold as a kit for many years.

The diagrams in **Fig. 3**, show how an 80 metre band Sudden can become a superhet and that in **Fig.3(a)** shows the original Sudden circuit which has to be modified. This has a single-ended audio output from the NE602 mixer. The circuit is interrupted at this point. Pins 4 and 5 have to be isolated on the printed circuit board (p.c.b.) and the additional stages added.

In the diagram, **Fig. 3(b)**, I've shown the portion of Fig. 2. which is required for the conversion. These are the i.f. transformer, mixer and b.f.o.. They could be built on a small board mounted on the Sudden p.c.b.

The output from the junction of the 2.2kΩ resistor and 100nF capacitor is then taken to the audio stages, which have been isolated from the NE602. The job is done and the Sudden is now a superhet. So, why not try the project yourself?

PW

Valve & Vintage

It's Phil Cadman G4JCP on duty - in the back yard - of the vintage wireless shop this month. Donning his brown dust-coat Phil says he's hot and has had much feedback on his filament current hungry PM2DX valve!

Hello and a 'warm' welcome to the Valve and Vintage 'shop'. Whew! The hot weather and all those glowing valves have forced me out into the shop's back yard to cool off. Rather appropriate then, that I've a couple of transistor topics for you this time.

First I want to thank everyone who contacted me about my PM2DX 2V battery valve. If you remember, I was surprised to discover its filament current (190mA) was almost double what it should have been.

All my valve data books give the filament current as 100mA, save for a mention of the PM2DX in **Keith Thrower's History of the British Radio Valve To 1940**. Keith lists the PM2DX twice: first he gives the filament current as 250mA, but later reverts to the usual value of 100mA. The figure of 250mA could be a misprint, or it may be that Mullard improved the efficiency of the filament early in the production life of the valve.

Several readers with PM2DXs took the trouble (**thank you all!**) to measure the filament current. In total, three valves measured close to 200mA. The remainder measuring between 90mA and 113mA. While 200mA isn't 250mA, it does seem that there are (at least) two versions of the PM2DX in existence.

One delightful outcome of my call for help was the number of people who said that the PM2DX had reminded them of their early adventures in radio construction. One such letter came from **Richard Youard**, London. Richard told me how he once built a one-valved (6K7) receiver that entirely powered by a 4.5V 'flat' battery. Yes, that's 4.5V h.t. and 4.5V for the heater!

While I've come across many designs that use a very low h.t. voltage, I couldn't recall any which deliberately under-run valve heaters. (The 6K7 has a 6.3V heater.) However, a search of the Internet soon provided the circuit of a two-valve t.r.f. receiver working from a 6V h.t. supply and a 4.5V heater supply.

Interestingly, the valves - 6C6 the UX6-based version of the 6J7 -

are connected as space charge tetrodes. Their control and screen grids are connected directly to the h.t. supply, while the signal is fed into the suppressor grid. I sent Richard a copy of the circuit - which he christened the Weirdo Two - and managed, after swapping valves around, to get it working. Unfortunately, its performance was poor.

Whenever a low-h.t. set doesn't work as it should, Richard's advice is to try different valves (of the same type). It seems minor differences in characteristics can have a disproportionate effect at low voltages. By the way, if anyone else has tried any strange circuits, please write and tell me.

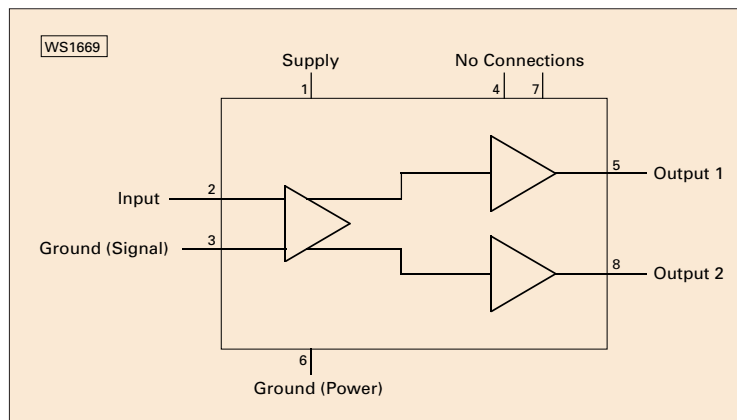
Valve Codes

Since I've come across more information about valve codes. If you recall, many miniature valves have both a three-character code and a four-character code printed on the glass envelope near their pins.

The first two characters of the three-character code denote the valve's type, while the last character indicates the revision number. This number would be incremented whenever the valve underwent a design change of some sort.

I mentioned that the first character of the four-character code identifies where the valve was made. I've now discovered that the next three characters are, in order: a number equal to the last digit of the year in which the valve was made; a letter representing the month of that year (A = January, B = February, etc.), and the number of the week within that month.

Fig.1: The functional layout block diagram of the TDA7052. As clearly shown, it's actually two amplifiers fed in antiphase, connected in a bridge circuit (see text for more information).



Germanium Transistors

I received a very interesting letter from **Godfrey Manning G4GLM**. In which he describes an ailment which affects old 'fat-shaped', four-lead germanium transistors such as the AF117. He says, "internal bonds, possibly solder, seem to be made of an alloy that can diffuse through the jelly-like filling, thus shorting at least one electrode to the case".

Thanks Godfrey! This effect is potentially disastrous because the case is nearly always connected to earth. Godfrey's letter struck a chord as quite recently I'd come across a single-transistor, t.r.f. radio tuner that I'd made over 30 years ago. The tuner hadn't been used for some time and when I tried it I got absolutely nothing. The AF116 was dead. Now I know why!

Later in his letter Godfrey mentioned something that was completely new to me; "transistors affected in this way might become microphonic and hence easily diagnosed. I've heard of valves having this characteristic (not necessarily under fault conditions) but never semiconductors."

Anyone with an old radio that uses AF117-style transistors should keep this potential problem in mind, and might consider obtaining spares. Although there's no guarantee that the spares themselves won't suffer the same fate!

Godfrey has a limited number of old germanium transistors of varying types and has very kindly made a generous offer: If anyone needs a germanium transistor to bring an old set back to life (or needs one for some other, equally

worthy cause) then providing he has one, he'll supply a replacement free of charge. However, you must send a post-paid padded bag.

Write to: **Dr. Godfrey Manning**
G4GLM, 63 The Drive, Edgware,
Middlesex HA8 8PS, stating what type you need. Please don't forget to include a stamped self-addressed padded envelope. Many thanks, Godfrey.

Triode & Amplifier

While playing around with various mains triodes as regenerative detectors, I thought about the possibility of adding an amplifier to drive a loudspeaker. I didn't favour using valves because it had to be small and self-contained, possibly drawing power solely from the 6.3V heater supply.

My first thought was to use an integrated circuit like the LM380 but it - and similar amplifiers - prefer a relatively high supply voltage. Looking through some catalogues in search of a solution, I found the Philips Semiconductors TDA7052 (Maplin stock code UK79L).

The functional layout of the device is shown in **Fig. 1**. As you can see, it's actually two amplifiers fed in antiphase, connected in a bridge circuit. The advantage of this technique is that for any given supply voltage, the output swing (across the loudspeaker) is almost double that of a single-ended amplifier.

Designed specifically for battery operated equipment, the diminutive

some instability when the volume control was turned fully clockwise. Capacitor C3 cured that. To be fair, it was probably my lousy layout which caused the instability rather than any misbehaviour of the TDA7052!

Fig. 1 shows two input configurations: capacitive coupling is best for most applications. However, if the amplifier is used with a regenerative detector and/or used in place of high-impedance headphones, then transformer coupling should prove superior.

Interstage transformers are somewhat scarce so try a 3VA or 6VA mains transformer which has a split 120V/120V primary. Use one 120V winding as the primary of T1, and the other 120V winding as the secondary. Leave any 'real' secondaries disconnected.

If the amplifier is driven from any signal source which uses a supply of more than 24V, high transient voltages might appear at the input of the TDA7052. Components R2, D1 and D2 (optional) clip any of the higher voltages before they cause damage. The amplifier can be run from batteries, 3 to 12V, or a 6.3V heater supply.

Rectifier D3 provides half-wave rectification from 6.3V a.c. supplies which have one side connected to h.t. negative. Alternatively, use D4 and D5 where the 6.3V a.c. supply is centre-tapped. Note that D4 and D5 are **Schottky** rectifiers; their forward voltage drop is significantly less than that of normal silicon

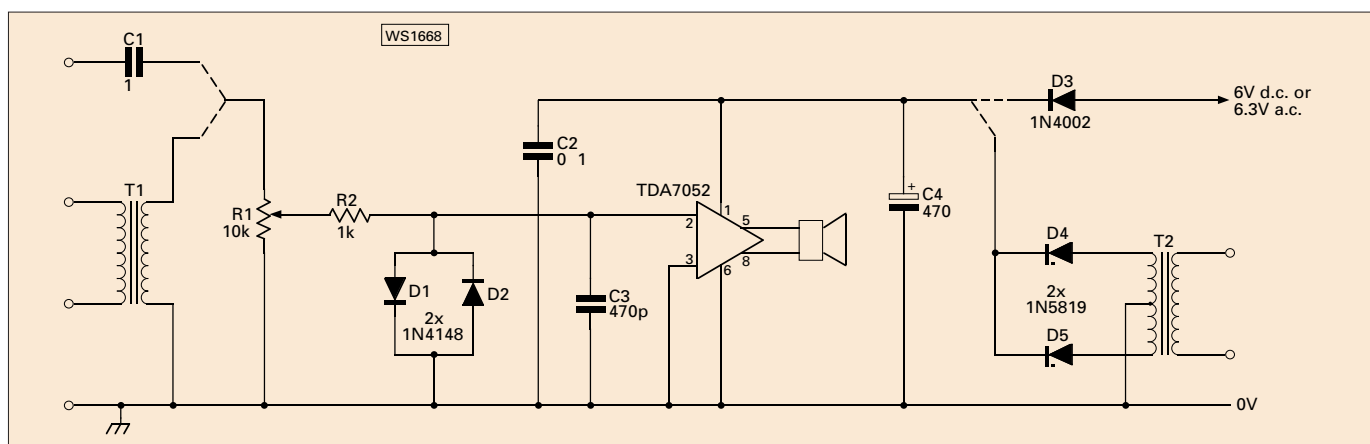
Philippe in The Netherlands. The site can be accessed directly at <http://home.wxs.nl/~frank.philipse/frank/frank.html>

Frank, and his friend John Atwood (plus others), have scanned many hundreds of valve data sheets and placed them on the Web in PDF (Adobe's Portable Document Format) form. The vast majority of these documents are full data sheets, and in the case of some popular valves, there are even data sheets from more than one manufacturer.

Having spoken to Frank via E-mail, I know he's looking for detailed data sheets published by British valve manufacturers. Mazda in particular. However, I must emphasise that Frank is **only interested in full data sheets**, the ones that typically include characteristic curves, detailed design data and manufacturer's notes. Having said that, any data on really obscure valves is better than nothing but **please be aware of copyright - someone may well own the copyright even on a defunct company's publications**.

Not on the Internet; so why should you care? Well, sites like Frank's will increasingly prove invaluable to valve enthusiasts who need information. Wouldn't it be better for that obscure valve data book to be publicly available on the Internet rather than just stuck on your bookshelf? And what's going to happen to it

Fig.2: The low voltage amplifier project used by G4JCP. Please note that the diodes used in the power supply (D4 and 5) are Schottky types (see text).



TDA7052 can produce over 1W into an 8Ω load with a 6V supply. Better still, it's specified to work down to just 3V! The gain is internally fixed at 39dB (about 90-times voltage gain) and no external stabilisation components are needed. Its quiescent current is commendably low at 4mA.

I made up an experimental circuit, **Fig. 2**, on a small piece of Veroboard. Of the components shown, only C2 is absolutely necessary and must be connected as close as possible to pins one and six of the TDA7052. Capacitor C1 is only required when the amplifier is run from batteries or if the power supply leads are more than a few centimetres long.

When powered from a 6V accumulator, the amplifier performed very well except for

rectifiers. Useful when you've only got 3.15V a.c. to begin with.

Valve Data Sheets

Now, do you have any valve data sheets you could donate to a worthy cause? Let me explain.

There's an ever increasing amount of valve and valve-related information on the Internet. Specifically, there's an interactive database on the Web at <http://www.duncanamps.co.uk/cgi-bin/tdsl3.exe/> which holds links to several thousand valve data sheets and related documents.

One site which figures very prominently in the database is maintained by Frank

anyway, when you finally 'lose your vacuum'?

If you do have any valve information you think might be useful, please tell Frank what you have. He can be contacted at frank.philipse@wxs.nl or you can contact me and I'll pass your message on. Outright donations are best but Frank will return material if requested.

Ah, break time over. I suppose I'd better get back into 'the shop'. Please send your comments and letters to me either via the PW offices, via E-mail to phil@valveandvintage.co.uk or direct to **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX**. Cheerio until next time!

PW

VHF DXER

By **DAVID BUTLER G4ASR**,
YEW TREE COTTAGE,
LOWER MAESCOED,
HEREFORDSHIRE HR2 0HP

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E-MAIL: g4asr@btinternet.com

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

During June there was a considerable amount of long distance contacts being made on the 50, 70 and 144MHz bands. On the 50MHz band the main propagation modes that enabled this to be achieved were Sporadic-E (Sp-E) and trans-equatorial propagation (t.e.p.).

Indeed propagation via Sp-E was quite impressive with the 50MHz band being open via this mode on every single day during June from somewhere in the UK. Surprisingly all continents (Africa, Asia, Europe, Oceania, South America and North America) were worked from the UK during the month.

Although Sp-E propagation was prevalent on the 50MHz band it hardly made any impact on higher frequencies. There were two openings on the 144MHz band during the middle of June but these lasted only a matter of minutes. This was disappointing to many seasoned DX operators who were looking forward to working some exotic DX on that band. However, as way of compensation the long distance tropo path between the UK and the Canary Islands opened up again, allowing some lucky stations to make contacts over paths in excess of 3000km.

SPORADIC PROPAGATION

The main mode of propagation on the 50MHz band during the summer months is Sporadic-E. This mode arises when intense clouds of ionisation develop at a height of

around 90km. Because of their intensity the clouds are able to reflect frequencies well into the v.h.f. region. The clouds are often relatively localised ranging in size from maybe a few tens of metres up to 200km.

Long term studies of Sp-E suggest that the clouds tend to be located over the same place day after day. This is a pattern which closely fits the position of eddies in the high altitude jet stream winds.

Wind shears in the upper atmosphere

distance of 1500-2000km or so from your QTH. From central UK this will give you contacts all over mainland Europe to countries such as Croatia, Italy, Slovenia and Yugoslavia.

Frequently a double-hop path exists enabling contacts up to 4000km to be made. This will give you contacts into the Middle East with countries such as Israel, Jordan and Lebanon or the nearer regions of Africa such as Egypt or Morocco.

THIS MONTH DAVID BUTLER G4ASR HAS REPORTS OF CONTACTS WITH ALL CONTINENTS ON THE 50MHZ BAND.

move the ionised clouds, maybe by as much as 400km per hour. This causes the area affected by the propagation to move and the skip distance to change significantly over a short period of time.

One moment you might be contacting stations in Poland and then a few minutes later the propagation path could move giving propagation into Austria. During lengthy openings these Sp-E clouds will continuously form, disperse and re-form again. It's all very sporadic!

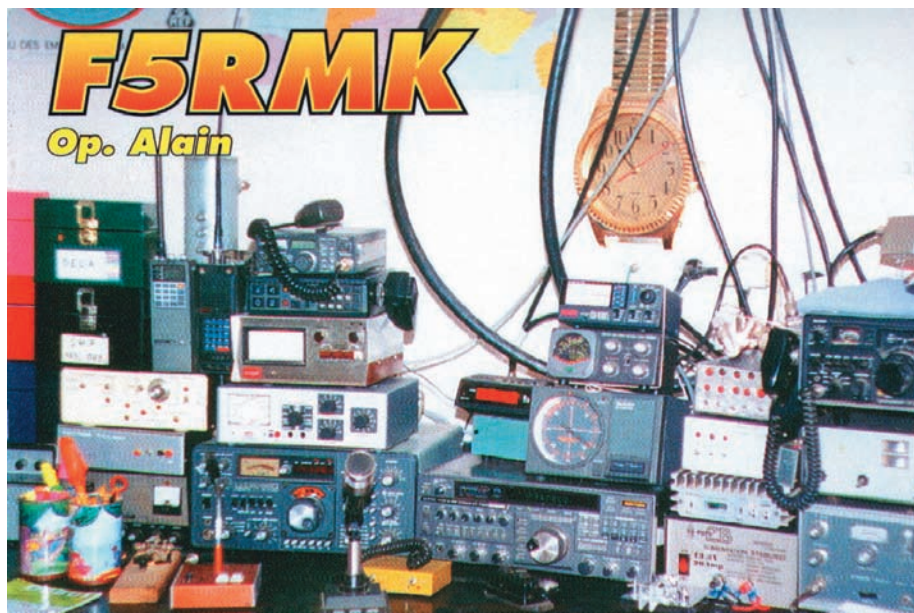
Occurring at E-layer height a single-hop distance enables contacts to be made over a

Although rarer an even greater multiple of hops is possible. A three-hop path will reach stations in excess of 4500km (Asiatic Russia, Canada or Newfoundland) whereas a four-hop path could reach into the W4 and W5 call areas of North America. One-hop paths are very common and the received signal strengths are very strong. As the number of hops increase the path will (generally) become less stable and will exhibit reduced signal strength often with considerable fading. These multiple hop paths, where the real DX stations are to be found, often occur at the same time as single-hop paths.

During June the 50MHz band was open every single day via one hop Sp-E propagation. All of Europe was in there including rarities such as ER1LW/P (Moldova), OH0JWH (Aland Islands), OJ0VR (Market Reef), OY9JD (Faroe Islands) and TF3GW (Iceland). At times the ionisation was located smack bang over the UK allowing stations in Scotland to make contacts with operators in southern England and the Channel Islands.

Paul Wilton M1CNK (Hampshire IO90) reports that he has recently obtained a Yaesu FT-726 which now gives him access to the 50MHz band. At the present time he is using the transceiver barefoot with a simple home-made dipole hung between two chimneys.

Paul mentions that he normally checks the band at around 1930 hours when he gets home from work and doesn't have the luxury of spending hours monitoring the band. His



● Inside the shack of v.h.f. DXer Alain Daguier F5RMK.

recent s.s.b. contacts include the stations of EH7AH (IM67), ES5GI (Estonia KO38), DK8ZB (Germany JN49), DG8RAN (JN69), GM0EWX (Scotland IO67), OE75MWS (Austria JN88), S51DI (JN76), YU1EXY (Yugoslavia KN04), YU4WU (JN84), YZ1AU (KN04), 9A1HCD (JN85) and 9A3TN (JN85). Paul hopes that despite his limitations his log of stations will act as an encouragement to those thinking of 'dipping their toes' into the 50MHz band.

Charlie 2E1PZT is another station who is running low power into a small antenna. He reports that although he has only been licensed a few weeks his 50MHz locator squares map is now bursting with colour! On June 9 he worked the Italian stations of IC8AMR (JN60), IK0PEA (JN61), IK5JWQ (JN52), IW0FC (JN61) and 9H0O (JM75) on Malta. His best DX so far was on May 31 when he made s.s.b. contacts with the North American stations of K1SG (FN42) and VE1YX (FN74).

Jeremy Kewn G7TBJ (Cornwall IO70) mentions that he uses a R & N Electronics transverter running 25W into a 3-element Yagi located in the loft space. On May 30 he heard LU7FM (Argentina) and PP5BC (Brazil) but was unable to work them because of the large pile-up. However, he has recently made some good European contacts with the stations of EH7KW (Spain), HF1UKF (Poland), HVOA (Vatican City), S51DI (Slovenia) and 9A3RE (Croatia).

Double-hop Sp-E paths were also very much in evidence during June. These Sp-E openings typically give contacts into the Arctic region, Russia, the Middle East and North Africa.

Contacts made from central UK with stations in the Arctic and Russian areas included JW0PK (Svalbard) around 3000km, RW0IW/3 (Russia) at 2800km and RU4CE at 3200km. Stations in the Middle East lie approximately 3300-3700km from the UK.

During June many c.w. and s.s.b. contacts were made with operators such as JY9NX (Jordan), OD5/OK1MU (Lebanon), TA1AZ (Turkey), ZC4FL (UK Bases, Cyprus), 4Z5AO (Israel) and 5B4/G1JJE (Cyprus). Double-hop Sp-E openings also extended into north Africa with QSO's being made with CU8AO (Azores) at 2750km and SU9ZZ (Egypt) at around 3500km.

Even greater distances are possible via multi-hop Sp-E propagation allowing contacts to be made deep into Asia, Africa and North America. Typical of these were contacts made with the stations of UN6P (MO60) and RA9MF (MO65), both in Russia at around 4700km, TT8JE (Chad) also at 4700km and A45XR (Oman) at a distance of 5900km from central UK.

Transatlantic openings into the Caribbean area, Canada and North America were also recorded on June 5, 10, 12, 14 and 23. The Sp-E opening on June 5 commenced around 2000UTC with stations in southern and central England hearing the VO1ZA beacon in Newfoundland. By 2130UTC the propagation had spread into the W4 call area with stations over much of England and

Wales making numerous c.w. and s.s.b. contacts. Amongst the DX being contacted in the 3 hour opening were the stations of AE4RO (EL97), N4IS (EL96), WA4LOX (EL87) and WA4NJP (EM84), all approximately 7000km away.

The next transatlantic event occurred on June 10 and although only lasting an hour or so it enabled even greater distances to be worked. From 1730UTC the 50MHz band was open to the west coast of the USA (W7) and Canada (VE7).

Some of the longest distance contacts of around 7500-8000km were being made by stations located in London and south-east England. Amongst the stations contacted were K7RAT (CN75), KB7WW (CN85), VE7IL (CN79) and VE7XF (CN89).

The openings on June 12, 14 and 15 were very brief affairs but the event on Saturday June 23 was considerably better. The 50MHz band had been quiet all morning when suddenly up popped the station of FG5BG on Guadeloupe. He was running 50W output into a 4-element cubical quad antenna that had only been put up that morning!

At 1330UTC FG5BG was heard working stations in Belgium and the Netherlands and over the next few hours the propagation spread over central UK and across to Wales. Many stations then made a c.w. contact to claim a new country. At 1600UTC the station of WP4KJJ (Puerto Rico) was heard in northern England but I don't have any reports of him working UK stations at this time.

UNUSUAL OPENING

A very unusual mixed-mode opening occurred during the morning of June 11. At 0915UTC stations in eastern Europe reported hearing VK6JQ (PH12) in Western Australia. The propagation was assumed to be multi-hop Sp-E linking into trans-equatorial propagation (t.e.p.) somewhere over the Indian Ocean.

By 0945UTC the opening had reached into Belgium and Germany. A few minutes later the signals from Australia just peeked into the UK with a few stations in south-east England scraping a c.w. contact before the tenuous propagation disappeared. That must have been really exciting!

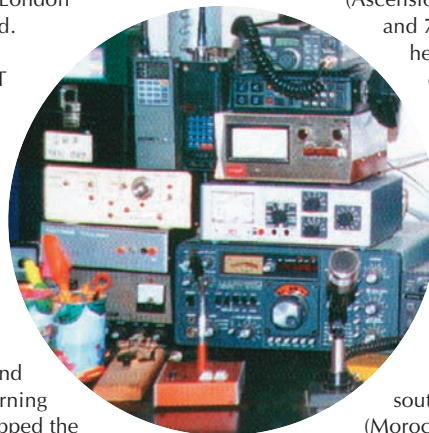
Surprisingly a similar opening to Australia occurred on June 29. **Bill GM4DGT** reports that he was operating from the HQ of the Stirling and District Amateur Radio Society using their **GM6NX** club callsign.

At 1056UTC Bill heard a weak unidentified c.w. station calling CQ. After sending QRZ in Morse back came the station of VK6JQ.

Signals were very difficult to copy

because of terrific video interference but a two-way contact was achieved. Bill mentions that the Stirling Club has now worked all continents (WAC) on the 50MHz band in just over one year of operation.

As if that wasn't enough there were also 13 days during June when the 50MHz band was open via trans-equatorial propagation (t.e.p.) to South America and southern Africa. Stations reported during the period included FR1GZ (Reunion Island), PP1CZ, PP5JD and PY5CC (Brazil), PZ5RA (Suriname), ZS6PJS (South Africa), Z22JE (Zimbabwe) and 9J2BO (Zambia). The beacon stations ZD8VHF (Ascension Island), ZS6DN, ZS6TWB and 7Q7SIX (Malawi) were also heard during these t.e.p. openings.



THE 144MHZ BAND

Only two ionospheric Sp-E openings occurred on the 144MHz band during June. The first on June 15 commenced at 1105UTC and lasted for about 20 minutes.

Contacts were made from southeast England with CN8HB (Morocco) and EA7GTF (Spain).

On the following day, June 16, the 144MHz band was open between 1615-1630UTC to exactly the same areas.

Stations in northern England (IO83) reported making s.s.b. contacts with CN8LI, EA7EMC and EA7GBG and that was about it. However, there were also some good tropospheric openings to southern France, Spain and the Canary Islands during the period.

Jeremy G7TBJ reports that he runs 3W from a Kenwood TR-751e transceiver into a 12-element ZL Special antenna. Operating from a portable location in Cornwall he made s.s.b. contacts on June 19 with the stations of F6FHP (IN94), EA1CRK (IN73), EA1OS (IN53) and EB1FDY (IN53). Best DX of the evening though was EA8BPX (IL18) at 2636km and EB8BTV (IL18) at 2650km.

During the evening of June 21 G7TBJ made further contacts with F4BKV (IN95), EA1DAX, EA1DKV and EB1DEY (all in IN53). He also made another contact with EB8BTV on the Canary Islands and all with only 3W output!

Later that evening at 2205UTC the station of **Tim Fern G4LOH** (N.Yorkshire IO94) also contacted EB8BTV over a distance of 3130km. Now that is real DX!

DEADLINES

That's it again for another month. Forward any news, views, comments or photographs to the address and by the date given at the top of the column.

Thanks for your letters and good luck with the DX. See you again next month.

73, David G4ASR

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REPORTS, INFORMATION AND PHOTOGRAPHS TO ME PLEASE BY THE 15TH OF EACH MONTH.

Starting us off this month is some information from **Henryk Kotowski SM0JHF** who thought *PW* readers would be interested to hear about two of his friends living in Poland.

Henryk reports: **Kazimierz SP2FAX** got his licence almost 30 years ago and soon developed an interest in chasing DX and contest operating in his hometown of Bydgoszcz. His first antennas were cubical quads that worked extremely well but were difficult to maintain.

Kazimierz enjoyed operating up until Poland declared Martial Law in 1981 and all Radio Amateur activity was suspended. Several years passed by until restrictions were finally lifted and in 1995 Kazimierz came back into the hobby in a big way!

A plot of land was purchased after checking ground conductivity charts. Work then started to set up his huge antenna farm. Today, it includes a 3-element Yagi for 14MHz fixed facing south, a 3-element Yagi for 7MHz and two 6-element Yagis each for 14, 21 and 28MHz. Verticals are used for 1.8 and 3.5MHz and beverage wires for receiving on these bands. An FT-1000 is Kazimierz's chosen transceiver with a home-brew amplifier to boost his signal!

Another operator who is very active in Poland on the bands is **Chris SP7GIQ** who gained his licence in 1972 at the age of 16. Chris quickly became interested in building Yagi antennas and taking part in contests at clubs in the town of Warszawa.

Ten years ago Chris moved to the town of Lask where he erected a few towers and started building the first of several antennas. These now include a 2-element Quad for 7MHz, a 4-element Quad at 27m with 4+4 stacked Quads at 35m for 14MHz, the same

for 21MHz and a 5-element Quad at 27m with 5+5+5+5 stacked Quads at 35m for 28MHz.

Chris also uses vertical antennas on the 1.8 and 3.5MHz bands and preferred equipment is an IC-715A with an ancient Alpha amplifier. With all that hardware it is no wonder that both operators have won their fair share of contests.

Poland has issued over 15000 licenses with the prefixes SP, SQ, SN and 3Z. The prefix SO was issued to foreign nationals who were residents or visitors to the country. Since 1

from you Tom and I am glad you enjoyed your holiday.

SHORT WAVE LISTENER

Long time s.w.l. **J. Cubitt** (Sorry, you didn't give your first name) in Los Alcazares, Spain sent me a letter to say: "I was rather alarmed to read in various periodicals that Morse code is dead and giving way to other more sophisticated modes of communication. I decided to dig out my old Yaesu FRG-7 and

CARL GW0VSW PRESENTS A PACKED REPORT THIS MONTH STARTING OFF WITH NEWS OF AMATEURS IN POLAND.

January this year the CEPT agreement has taken effect and it is now possible to operate with a reciprocal licence. Further information can be found at www.pzk.org.pl or by contacting the National society, **Ploski Związek Krotkofalowcow, PO Box 61, 64-100 Leszno 1, Poland.**

SCOTTISH VISIT

Tom Hutton GW0HUT decided to take advantage of the better weather conditions and travel to Scotland for a short holiday. Tom says "I found myself in a small Post Office in Burghead overlooking the Moray Firth where enquiries told me that **Donald Noble GM3NCS** lived close by.

"Contact was made and both my wife and I enjoyed Donald's hospitality for several hours. During the visit Donald and I were able

see just what was around on the h.f. bands.

"The amateur bands were crammed full of signals together with various 3 figure callsigns like 4XZ on 6385/6445/7960kHz and 8BY on 10250/12080/13250kHz. One interesting station is a lady who precedes her 5 letter callsign in voice, with a recording of the song *Lincolnshire Poacher*. She then repeats every 5 letter code group in international phonetics for hours. Can any of your readers throw some light on what these transmissions are?"

If any readers do know what these transmissions are I would be happy to pass on the information to J. Cubitt.

YOUR REPORTS

This month we start with the s.s.b. log of **Larry Stringer G4GZG**, Ongar who worked various European stations as well as J5X (Guinea-Bissau) on 7MHz at 2206.

Peter Lowrie M15JYK, Newtonabbey, Northern Ireland also spent some time on this band and was pleased to work a new country ZP9BTA (Paraguay) with a 5/5 report at 2337UTC. Peter used an FT-101ZD, s.s.b. and 10W to a 'wave' sloper antenna.

Operating on 10MHz Larry worked JW/OK1FZM (Svalbard) 1954, AP2ARS the club call of the Pakistan Amateur Radio Society at 2130, EZ56BO (Turkmenistan) at 2220UTC followed a short while later by UA9CA (Asiatic Russia) and W5TZC (Arkansas, U.S.A.) around 0330UTC.



● Kazimierz SP2FAX's impressive antenna farm.



● Using his FT-1000 SP2FAX spends much time operating in his well equipped shack.

● Chris SP7GIQ gained his licence in 1972 and soon started building Yagi antennas.



● Tom Hutton GW0HUT met up with Donald Noble GM3NCS while on holiday in Scotland.

THE 14MHZ BAND

Here in South Wales, **Robin Trebilcock GW3ZCF** in Bishopston used PSK31 to contact TF3AO (Iceland) 1636, J14POR (Japan) 2001, 7X4DR (Algeria) 2233 and PJ2MI (Netherland Antilles) at 2359UTC. All contacts were made using his IC-775 and 40m horizontal loop. I hope you had a good time in Crete Robin?

All c.w. operator **Ted Trowell G2HKU** on the Isle of Sheppy, used his Ten-Tec Omni V and G5RV to work 9M2TO (West Malaysia) at 2100UTC.

Larry G4GZG also spent some time on this band working VP5MM (Turks & Caicos) 0322, ZL/DK1IE (New Zealand) 0620, VK3XU (Australia) 0630 followed a little later by VU2TS (India) 1653 and J88DR (St. Vincent) at 2041UTC.

According to **Owen Williams G0PHY** in Biggleswade, Bedfordshire, "Svalbard must have been very crowded Island this month!". He worked JW/OK1OPN, JW0PK and JW/OK1FZM in one afternoon followed later by OY9UR (Faroe Islands).

THE 18 & 21MHZ BANDS

On to 18MHz now where Ted G2HKU worked the, AP2ARS station at 1500 followed later by CO8LY (Cuba) at 200UTC.

Carlos D44AC (Cape Verde) was the only s.s.b. contact for Robin GW3ZCF this month on 21MHz at 1530UTC. A picture of Carlos D44AC appeared in the article by Henryk SM0JHF in *PW* June. A long list of PSK31 contacts made between 1014 and 1840UTC included FG5GI (Guadeloupe), HL2XIQ (South Korea), YB5QZ (Indonesia), TR8CA (Gabon), J28NH (Djibouti) and ZP5ALI (Paraguay).

THE 24 & 28MHZ BANDS

Having heard a computer generated voice on 21MHz giving out details of DX transmissions for EM1HO in Antarctica. Owen G0PHY was pleased to discover his 14MHz dipole would tune up on 24MHz, a place that he does not normally operate. A short while later, the station in Antarctica was worked and confirmation has already been received via I2PJA the QSL manager.

Ted G2HKU managed a few contacts as well at 1500UTC. They included 5R8FU (Madagascar), YB0DPO (Indonesia) and

VP2VE (British Virgin Islands).

During an afternoon session on the 28MHz band Ted found VQ9IO (Chagos), PV0T (Brazil) on Trindade Island, CX5BW (Uruguay), T14G (Costa Rica), ZF2MU (Cayman Islands) and D2EB (Angola).

The chosen mode of Peter MI5JYK was f.m. who used his Albrecht transceiver and very bent dipole to work DL1YC (Germany), SQ9IDE (Poland) for a new country on this band, OK1FM (Czech Republic), LX2SM (Luxembourg) also a new country and HB9BOS (Switzerland) between 1230 and 1450UTC.

Finally, the PSK31 of Robin GW3ZCF found TR8CA (Gabon) 1705, LW9HBA (Argentina) 1902, 4Z5LR (Israel) and CX1SI (Uruguay) both around 1900UTC.

QSL CORNER

Here is this month's list of QSL information

PW LISTENING & OPERATING WATCH LIST. (ALL TIMES UTC)

Sean Gilbert G4UCJ operates most days around 0700-1100 and 2200-0200 on all bands using an IC-746 and 50W into a half-size G5RV, WARC inverted vee or HF6 vertical.

Rob Mannion G3FXD listens and operates weekdays and weekends, portable or from home at 1800-1830 on 3.7MHz with 100W s.s.b. and 3.530 or 3.560KHz and 18.105KHz QRP c.w. using an Alinco DX-70 transceiver and a long wire, mobile whips or vertical fishing rod antennae.

Carl Mason GW0VSW listens and operates on 14.060 and 10.106MHz most evenings at 1700 with a Ten Tec Argonaut 2 and inverted G5RV.

Don McLean G3NOF operates 1030 Saturdays on 3.685KHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net on 3.665KHz using a Kenwood TS-950 and trapped dipole antenna.

Leighton Smart GW0LBI operates on some weekdays and Sunday mornings on 28.555KHz s.s.b. regardless of conditions, at 1030 using a President Lincoln transceiver with 20W to a 11m half-wave vertical.

Brian Williams GW0GHF operates most afternoons around 1400. He also simultaneously monitors 70.200KHz s.s.b. and 51.510KHz n.b.f.m. at this time and is looking for weekly skeds especially on 70MHz. Contact Brian QTHR.

George Woods G3LPT operates an open net on 29.630KHz n.b.f.m. 0930 Tuesday to Friday.

Jon Wheeler G0IUE monitors 29.600KHz n.b.f.m. every evening between 1730 and 2230 regardless of conditions using a Yaesu FT-920 transceiver running 100W and 2-element tri-band beam.

Brian Parsons GW0KZK listens and operates on 14.250KHz 1000-12000 and 7075KHz 1400-1600 most days using an Yaesu FT-1000MP and 100W into a 4 element Mosely beam.

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ECC80	1.50	PY500A	3.00	6C4	2.00	805	45.00
ECH35	3.50	PY800/801	1.50	6CB6A	3.00	807	7.50
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ECH81	3.00	QOV03-10	5.00	6CL6	3.00	812A	55.00
ECL82	5.00	QOV03-20A	10.00	6CG7	7.50	813	27.50
ECL86	7.50	QOV06-40A	12.00	6CH6	3.00	833A	85.00
ECL800	25.00	U19	8.00	6CWA	6.00	866A	20.00
EF37A	3.50	UAB80	1.50	6D05	17.50	872A	30.00
EF39	2.75	UCH42	5.50	6D06B	10.00	931A	25.00
EF40	4.00	UCL82	2.00	6F6G	6.00	2050A	12.50
EF86	5.00	UCL83	2.00	6F07	7.50	5687WB	6.00
EF91	2.00	UF89	4.00	6GK6	4.00	5751	6.00
EF183/4	2.00	UL41	12.00	6J5G	6.00	5763	6.00
EL33	15.00	UL84	4.00	6J5M	4.00	5814A	5.00
EL34	5.00	UY41	4.00	6J7	3.00	5842	12.00
EL34G	5.00	UY85	2.00	6JB6A	27.50	6072A	6.00
EL36	5.00	VR105/30	3.00	6JEC	27.50	6080	6.00
EL41	3.50	VR150/30	3.00	6JS6C	27.50	6146B	15.00
EL84	3.00	Z759	10.00	6K6GT	4.00	6201	10.00
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EL360	15.00	2D21	3.50	6L6GC	20.00	6550A	25.00
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PACKET: G3LDI @ GB7LDI

I'm often being asked about PK232 wiring for various rigs. The FT-1000MP is one of the most popular and the following was posted onto the FT-1000MP list. I thought it was quite useful and might help anyone having problems.

To begin with, it would have helped if Yaesu had labelled the connectors on the back AFSK and FSK instead of PACKET and RTTY (respectively)! PK-232: The FSK signal (NORMAL or REVERSED) comes from the J7 round connector on the back of the 232, but the PTT and audio lines OUT of the PK-232 come from the J4 or J6 flat connectors (Radio 1 or Radio 2).

If you decide to set up for FSK, you will need wires coming from J7 (FSK-N or FSK-R) and from J4 or J6 (received audio) all going to the MP's RTTY connector. If you decide on AFSK (easier if you're just starting), you will have **one** cable - all wires going from the J4 or J6 connector to the MP's PACKET connector.

Here's the wiring for the original cable supplied with the PK-232 to operate AFSK using the PACKET connector:
J4 or J6 connectors on PK-232:

- * PIN #1 (green wire) is RX Audio - should go to PIN #4 PACKET DIN (data out)
- * PIN #2 (white wire) is Tx audio - should go to PIN #1 PACKET DIN (data in)
- * PIN #3 (black wire) is squelch - (not used)
- * PIN #4 (brown wire) is ground - should go to PIN #2 PACKET DIN
- * PIN #5 (red wire) is PTT - should go to PIN #3 PACKET DIN

As viewed from the rear panel of the rig, the pin numbers from left to right are 1-4-2-5-3

For direct FSK operation on RTTY:
PK-232 J7 (DIN) connector:

- * Pin #1 = FSK-N(ormal)
- * Pin #4 = FSK-R(everses) Use this one with the FT-1000MP or FT-990!
- * Pin #2 = Ground
- * Pin #5 = Mark input to scope (optional)
- * Pin #3 = Space input to scope (optional)

If using RTTY connector on back of FT-1000MP or FT-990:

- * Pin #1 = SHIFT (from PIN #4 of PK-232 DIN)
- * Pin #2 = Rx AF OUT (to PIN #1 of PK-232 J4 or J6 connector (green wire)

- * Pin #3 = PTT (from PIN #5 of PK-232 J4 or J6 connector (red wire)
- * Pin #4 = GROUND (from PIN #2 of PK-232 J7 (DIN) connector

HIGHER SPEED

By the time you read this, the launch of Transmeta's low power consumption TM5800

professional firmware is **not** free of charge like the normal Amateur Radio firmware. It needs to be registered at a registration fee of \$89. Those that already have an access code for the "marine firmware" can also use the same one for the "professional firmware".

The PTC-IIpro is the successor of PTC-II. The redesign was necessary because the PTC-II's DSP has unfortunately been discontinued.

ROGER COOKE G3LDI LOOKS AT PK232 WIRING, WEBSITES FOR YOU TO TRY AND ASKS IS THE PACKET NETWORK DOOMED?

chip should have taken place. This will be capable of processing data at a speed of 1GHz.

Analysts believe it will be just a matter of time before US notebook vendors in their smaller models use Transmeta chips as an alternative to Intel chips. The TM5800 chip will be almost 50% quicker than Intel's faster low-consumption chip for laptops and twice as quick as Intel's lowest-drain chips.

The chip will be made using 0.13 micron processing and carry a core voltage of 0.9-1.3V, down from the 1.1-1.6V in previous models. Using 0.13 micron processing reduces the size of chip circuits, allowing more functions to be added to a single chip. It also adds more chips to each silicon wafer, the material from which the chips are cut and packaged.

Transmeta is battling to win market share from Intel through faster chips that are also easier on laptop batteries and is promising chips next year that will be "two to three times quicker". Intel says it will upgrade its low-powered chips, also using 0.13 micron processing. The battle goes on, will it ever end?

UPDATE FOR SCS PTC-II

The professional firmware is the successor of the marine firmware for the SCS PTC-II's. It provides the PACTOR-IP-Bridge (PIB) for using TCP/IP over a PACTOR link.

Commercial customers and parties that are interested in the professional firmware will find it for download on the SCS homepage. The

New features include:

- * A new housing, with the new 'family-look' of the PTC-IIe
- * A TCXO-clock-oscillator for stable operation over wide ranges of temperature
- * 2Mb of SRAM as standard, with battery back-up
- * Transceiver-control now not only with TTL, but also with RS232-levels for the newer transceivers
- * New 100MHz-clocked and low power consuming DSP
- * Digital serial-number on the chip. A unique identification for each PTC-IIpro
- * Audio amplifier for direct connection of the station-speaker, which makes the use of the audio and SSB/DSP-filter modes very easy
- * Electronic (command controlled) power-OFF function

WEB PAGES TO CHECK

The images on the NASA website site get better and better. Some of the latest images from Hubble can be found at www.jpl.nasa.gov/pictures/wfpc Take a look at the Horsehead nebula at the very least, **Fig. 1.**

Typing is a skill much easier to acquire than copying c.w. at 20w.p.m. Yet, as you watch the print on the screen on RTTY or PSK31, it's plain that typing quality and speed has failed to improve much, if at all, over the past ten years.

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20 BC212L PNP transistor.....£1.00	8 555 timer IC's.....£1.00	15 16 pin DIL sockets.....£1.00
20 BC327 PNP transistor.....£1.00	10 1ns. crocodile clips.....£1.00	4 Stripboard - 9 tracks x 25 holes.....£1.00
20 BC337 PNP transistor.....£1.00	1 5mm white LED.....£1.00	5 3A 12-way connector strip.....£1.00
20 BC547B PNP transistor.....£1.00	1 5mm blue LED.....£1.00	5 3.5mm mono plugs inc. panel socket.....£1.00
20 BC557B PNP transistor.....£1.00	50 1Nf 100V poly caps.....£1.00	1 LT700 transformer.....£1.00
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1 MK484 AM radio IC inc data.....£1.00	50 47N 50V axial mini-caps.....£1.00	1 Nurse Call Tx/Rx pair.....£4.95
	1 1µF 500V Electrolytic caps.....£1.00	1 BNC/SO239 adaptor.....£0.95
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Write or telephone for technical data and prices, which range from: £50.00 to £132.00 for monoband loops covering 50 to 1.9MHz, and from: £275.00 to £320.00 for multiband loops and delay-line radiators for HF.

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Here's a great idea from **LW9EUJ**: "For those who like working pile-ups, the Bavarian Contest Club has organized a contest using the simulator developed by JE3MAS". If you want to have some fun just visit: www.bavarian-contest-club.de/contest/ped/ped_eng.html (Fig. 2). It isn't RTTY, but give it a go anyway.

Then there's the website that contains the searchable database that contains 60 000 E-mail addresses. **Boris T93Y** runs this operation at: www.t93y.com/english/contact/email.asp (Fig. 3). You can also add or edit your own address as well as locate many others as there are several million Amaterus in the Amateur Radio world!

Information on these Websites came courtesy of **Jim N2HOS** jem@n2hos.com - thanks Jim!

PACKET NETWORK RIP?

There have been reports of dissension among the troops! Nothing is happening! There is nothing new on the network! We are not experimenting! Another BBS has closed down! Another node has bitten the dust! The rot goes on and on.

We haven't reached the panic stage yet,

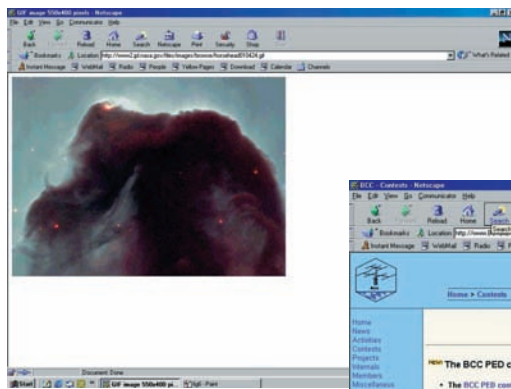


Fig.1.

but we are at the worry stage! Most of the newsletters carry letters or comments in a similar vein. I have noticed a distinct drop of traffic, both terrestrial and satellite. This is obviously due to the more reliant and speedy E-mail system.

However, this hobby is predominantly Amateur Radio, and being the old G3 LudDlTe that I am, I believe we should try to give predominance to a radio-based system. However, there is a very serious problem

Looking at what's involved with my station, I have running all the time: Terrestrial BBS on a Pentium 150, with a 145MHz port, and two 430MHz ports, one 9k6 (with no users!). Radios and antennas complementing these together with TNCs. h.f. port with radio and beam.

I have *Satgate* running on a networked

Pentium with TNC, 9k6 modem, Landwehr pre-amps, antennas. Two radios, and so on....

All this, plus a similar BBS/Node set-up at all the other licenced sites in the UK, just to send a few private messages, a very few intelligent bulletins and a lot of rubbish! If you equate the cost of all this with the gear needed to operate pure E-mail and Internet, we are on a hiding to nothing!

For Internet and E-mail, all that is needed is a PC, a cheap modem plug-in card and a telephone line, which most people have anyway! No contest! Plus, on the Internet, you have the added advantages of being able to send JPG pictures, even bit-map if you have the time, HTML text, a much more interesting lay-out, different colour text, mixed fonts and so on.

Why, therefore, do we keep the network running? Well, this is one of the questions I would like to ask **you**.

Please spare a little time to answer the questions below and let us see what the user wants from this network – if anything? Then we can either get on and improve it, knowing that we cannot compete with the Internet, or we can go away, switch off and take to working DX again!

Have I talked my way out of running a BBS/Satgate? I have presented the situation as I see it and know that we (the BBS network) are fighting a losing battle. It really is down to you, the user, who will decide, whether directly by using radio, or indirectly by using the telephone and ignoring the packet network.

I know it is slower, not much by *Satgate* really if we can get the mail over

only. This will always be there of course, especially on h.f., where data modes are as popular as ever, in fact more so, but the network as we know it is running out of steam. I do not want to see that happen. Use it or lose it! Here are the questions:

- 1 Do you wish to maintain a packet network as it is at present?
- 2 Would you be prepared to send your mail via radio in order to support it, in spite of the fact that it might be slower?
- 3 Do you support your local BBS financially?
- 4 Do you belong to a local data group?
- 5 Would you be prepared to become more involved?
- 6 Would it bother you if the *Satgate* mail delivery in the UK finished?
- 7 Would it bother you if the terrestrial BBS system in the UK finished?
- 8 Do you send Email to places abroad on a regular basis?
- 9 Do you send mail via *Satgate* abroad on a regular basis?
- 10 Have you ever compared the two systems?
- 11 Have you deserted the BBS for E-mail and Internet?
- 12 Would you be prepared to try the BBS system again?
- 13 Do you use packet a: daily b: weekly c: monthly d: never
- 14 Are you bothered about the route your mail takes?
- 15 Do you think we should embrace the Internet entirely, close down the packet Network, and assume each individual will obtain a PC, Modem and Email address, surfing the Internet for information?

It will be interesting to see what replies I get, if any, and by what medium they reach me. You can send via packet, which I would prefer, or E-mail, or both if you wish. If you use both I will try to keep a record of the difference in time of delivery.

I will collate the results and present them at a later date, giving plenty of time for you to reply. Please feel free to add comments, preferably of the constructive kind!

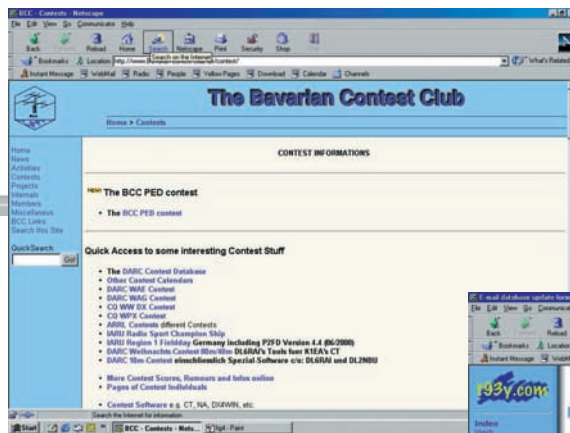


Fig.2.

the terrestrial network quickly. I know it's sometimes unreliable, but this is all part of the challenge and hopefully the satisfaction of using radio rather than telephones.

Yes, I know it probably is cheaper via E-mail, but it isn't radio! Do we need a system that can compete?

If the answer to that question is 'yes', then the network needs your support. If it is 'no' then we will be left with a one-to-one system

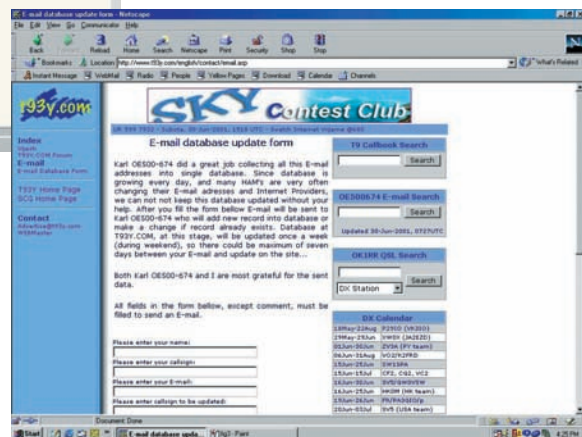


Fig.3.

Roger G3LDI

DOWN UNDER

By CHRIS EDMONDSON VK3CE
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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

‘Day, and welcome once again to the barely coherent mutterings from the Mouth in the South. (The *PW* folk used to call me the *Aussie Oracle*, but once they met me they realised it was all bluster and bravado and promptly changed the column’s name!)

I hope you thoroughly enjoyed the bright sunshine I imported for you in early June. Yes, you’ve just been pillaged during a whirlwind visit by none other than me! I somehow found myself in Dayton, Ohio, during late May,

So, I’ll start with a couple of shots from my visit to the Dayton show. The photo **Fig. 1** shows **Martin F. Jue K5FLU**. Sorry, who? Check his initials. Ever heard of MFJ? This man is full of ideas!

Jim Haynie W5JBP, is President of the ARRL and is shown here in **Fig. 2**. I was lucky enough to meet and interview Jim and Martin who are both very interesting gentlemen.

For those of you who have not visited Dayton, you simply **must!** It is quite beyond description.

My magazine, *Radiomag*, is to run a

reader tour there next year, and we’ll also take in such things as the Boeing aircraft factory, Icom America HQ and SGC in Seattle, NASA in Houston and Cape Kennedy (where we hope to view a Shuttle launch if the timetable remains as it is), the mind-boggling Smithsonian Institution in Washington DC, and the MFJ factory and warehouse in Starkville, Mississippi.

MAKING A BEELINE

After my visit to Dayton I decided that the

savings account on the card, the machine became more than a little confused.

I sought out the manager of the establishment and explained the problem. After all, it’s a long swim home... “Oh, what a shame,” I was told. “We just cut the retained cards up when that happens. You can get a new card when you get home.”

This did not come as good news. I still had about US\$16 and about A\$100, but that was about the extent of it. They went on to explain there was no way around the bank’s

CHRIS EDMONDSON VK3CE HAS BEEN ROUND THE WORLD - LITERALLY - READ ON TO FIND OUT WHERE HE’S BEEN AND WHO HE BUMPED INTO!

piddling Atlantic seemed so small and insignificant after the seemingly endless 15-hour Pacific crossing that I just couldn’t help myself! So, it was on a magnificently bright and clear June day that I found myself driving down the motorway, heading in a beeline for the *PW* offices in Dorset. Of course, I was a day late by the time I finally arrived there.

Looking for a little local holding shortly after landing at Heathrow, I had inserted my plastic card into a friendly-looking ATM... and promptly received the on-screen message ‘There Is No Such Account. Your Card Has Been Destroyed’. This did not come as good news, particularly as I was not carrying any cash or travel cheques.

It turns out UK banks do not offer quite the range of services we’re accustomed to in Australia, where you can have many different accounts linked together on one card, and the machines ask you which account you wish to access. The UK machines evidently assume you’re using a savings account, but as my account is a cheque account, and there’s no



● Fig. 2: Chris VK3CE got the chance to chat to Jim Haynie W5JBP, President of the ARRL at this year’s Dayton show.

rules. The card would be chopped up.

Close to panic, I rang my bank manager back in Australia. Thankfully, I had his home number in my mobile, as it was the middle of the night there.

The upshot of it all was that, after a very tense wait of a couple of hours, the head of



● Fig. 1: Martin F. Jue K5FLU - the man behind the innovative MFJ Company.

the British bank received a call from the head of the Australian bank. A deal was struck, and I became the first person in your bank's history to have their card returned after it had been swallowed by an ATM. Another first for an Aussie!

By the time I had my card back it was mid-afternoon. I was in suburban London, and had an appointment with the *PW* people something like 160km away for lunch. I was just a tad late, exceedingly peeved and thoroughly exhausted. Nobody had warned me that forgetting to sleep for close to a week made one act in strange ways. I found a bed and slept for the next 14 hours.

GO WEST YOUNG MAN!

The next morning, having come to the UK just to meet the *PW* team and determined not to waste a major trip, I jumped into a very sweet little hire car and headed west for Dorset. Or so I thought. I had gone something like 50 miles before I realised I was heading east. Oops!

Unable to bear the thought of not having a radio or three on a two-week round-the-world trip, I'd packed a tiny little Yaesu FT-90R 50W dual-band mobile and a short dual-band antenna into my bag. Before I left, I hacked away at the supplied d.c. cable and, **really** tempting fate, attached a cigarette lighter plug to it. Thankfully, it worked a treat!

Once I had nipped out your repeater plan and worked out how to generate a suitable tone, my trip was greatly enhanced. I managed to yack to a lot of you folk and crammed a great deal into my three days in the UK. One of these nice people gently pointed out that my geography was somewhat amiss.

I carried with me a large UK road atlas, a compass and a GPS receiver, (actually, from the weight of my cases I'd swear I also had a spare car, two complete sets of world phone books, a block of flats **and** the blasted kitchen sink hiding in there; my right arm is now three inches longer!) so I felt confident I would be able to navigate around the UK without difficulty. Fat chance!

For pity's sake, why didn't someone **tell** me the Sun had moved? We all **know** the Sun's way up in the northern sky, so you keep it to your left when heading East and right when heading West. It's automatic. You do it without thinking.

So, after my final night in the UK (at Woodmancote, a little village near Cheltenham) I headed for Heathrow for my flight to Germany for a tearful reunion with a long-lost daughter. I figured the three hours I allowed for the trip



● Fig. 3: Tex G1TEX is somewhat taken aback by Chris's insistence that he appears on this side of the camera!

would be just right. As I entered the outskirts of Bristol heading in **absolutely** the wrong direction, I realised something was horribly, dreadfully wrong. Somehow, I still made the flight...

There's probably very little point telling you anything about Britain beyond the evening I spent at **Rob Mannion's** place and the next day in the manic *PW* offices. (Manic? Yes, of course. I was there!) Most of the evening, rather than stay inside and be sociable, I spent out in the driveway tuning around on my radio and yapping to incredulous local Amateurs. But I did get to sample the very generous hospitality of Rob and his lovely wife, **Carol**, and spent many hours discussing the substantial differences in our lives half a planet apart.

HOSPITALITY SHOWN

I suppose I should admit something about my visit to the *PW* offices in Poole. I'm sure they're **far** too polite to beat their own drum by telling you of the great hospitality shown to me there.

I had a great laugh upon returning home to discover that my E-mail system had sent an auto-reply to a posting on the excellent *PW* Reader List at **pw_readers-on@pwpublishing.ltd.uk**. Rob spied my computer's response and wrote back that a 'whirlwind' had just wreaked havoc during a 'whirlwind tour' of his office. Indeed! Surely I caused no (substantial) damage while there?

The *PW* team are terrific. A really nice

bunch of people. In fact, I tried to steal a couple of them to work on my magazine, but the blighters resisted all of my pathetic approaches!

You only ever get to see all the feigned casual shots of the staff, but I managed to get a couple of more realistic shots of them. I wonder how many of these gems will be published!

First here's **Tex G1TEX** in his patented "How the heck should I know?" pose, **Fig. 3**. Oh, and in the art department I came across **Bob Kemp**, *PW's* Layouts and Design whizz (**Fig. 4**)! I wanted to take this entire floor of the building home with me. I'm jealous!

I simply would not forgive myself if I did not show you a picture of the *PW* company 'chariot', **Fig. 5**. This beauty, with liveried chauffeur, is sent to international ports to collect only the most eagerly-awaited and influential of foreign visitors. Regretfully, I did not fall into that category. However, I eagerly await reports of a visit by Mr Bean!

I had but one more full day in the UK and spent it driving north from Poole to Woodmancote via Salisbury Cathedral, Bath and the remarkable Stonehenge. You folk wouldn't think twice about wandering through a building perhaps 1000 years old. To a crude Australian, whose experience of old buildings' extended to nothing more than about 150 years or so of age, it was an incredible and remarkably moving experience.



● Fig. 4: Bob Kemp, *PW* Layouts & Design man was hard at work when Chris VK3CE visited the offices.

Flying home over a lot of countries, I could not help but observe that the world really isn't all that big. It looked pretty flat from the 747s and 777s I flew in, so I chucked my globes away when I got home. After all, we all know the world really is flat...

Catch you next time! If you can't wait until the December issue feel free to E-mail me (address at the top) or visit my website at **http://www.radiomag.com**. Cheers for now!

73 Chris VK3CE

● Fig. 5: The company chariot! (In reality Tex Swann's 'Plastic Pig' Reliant car!).

ATTENTION ALL AMATEUR RADIO CLUBS AND INDIVIDUALS...

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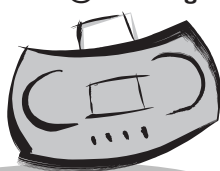
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This time I'm starting with news of from Sweden. The oldest DX or Media programme of all, *MediaScan* from Radio Sweden, will be available only in text form on the Internet from now on.

Mind you, *MediaScan*, www.sr.se/rs/media/ which developed from *Sweden Calling Dxers*, has for some time been concentrating on satellite news, with very little about radio. But in the past few months, the BBC World Service has stopped the *Waveguide* programme altogether, and Radio Netherlands has axed the broadcast form of *Media Network*, www.rnw.nl/realradio/index.html which, like *MediaScan* continues in text form.

This leaves as on-air mainstays *Communications World* from the Voice of America <http://www.trsc.com/cw/> and of course the perennial *Glenn Hauser's World of Radio*, www.angelfire.com/ok/worldofradio/ Meanwhile, the BBC appeared at time of writing to be sticking to its guns about dropping short

which will operate world-wide on existing a.m. short and medium wave; commercial satellite and satellites owned by the broadcaster.

Each system has its merits, for some audiences, in some circumstances. Listeners, like broadcasters, have to make choices and investments. Some of these will be a gamble. Will the system you choose be far more costly than you originally thought, and will it be outmoded by some upstart new system?

Here in *Practical Wireless*, we feature radio, ranging from the simple to the sophisticated. Many systems in the above list require the purchase of proprietary, expensive equipment, or the use of an (expensive) computer. For reasons of cost alone they are likely to be non-starters. This means that the audience also will be limited, whatever the BBC says.

The BBC claims that it has sufficient audience via the Internet to justify its actions. But a very recent study in the USA indicates that

international mass audio communication.

Well that little lot has taken up most of the column space this time and I'm at risk of boring you with repetition, but it's a vitally important topic that concerns us all deeply, and one which is causing the broadcasters a great deal of anguish.

NEWS UPDATE

The **Voice of America**, www.voa.gov had intended to follow the herd and axe its Brazilian (Portuguese), Thai and Uzbek transmissions, and reduce Turkish. But wiser heads and public opinion prevailed, and Brazilian has indeed gone (the transmission problems were too difficult) but Thai and Uzbek have been relieved, in reduced form, and Turkish is not to be reduced as much as planned.

Radio Austria International, having already faced a severe budget cut, is again battling against the tide. The Austrian government, in the face of much opposition, has ended ORFs legal obligation to provide an international service.

In future, ORF will have to find the money from its own resources. Radio Austria International, in business for forty years, currently broadcasts in five languages - English, German, French, Spanish, Arabic and Esperanto. Look at

http://roi.orf.at/en_infocenter.asp

In a seriously cheeky move, **Radio Netherlands**, www.rnw.nl/realaudio/index.html has taken over the BBC's abandoned frequencies for North America. Denounced by the BBC World Service as a publicity stunt, RNW gains 0200-0400 on 6.135; 0400-0700 on 6.175; 1000-1200 on 5.965; 1200-1630 on 9.515; 1300-1600 on 11.865; 1400-1600 on 15.220; 1700-1800 on 17.840; 2200-0000 on 9.590; 2200-0400 on 6.175 and 0000-0200 on 9.590MHz. Not bad going!

There's good news from **Radio Australia**. They're back in business on the 500kW transmitter at Darwin, in the remote north of Australia. Once the mainstay of RAs transmission system, Darwin was short-sightedly sold by the Australian government to religious broadcaster Christian Voice.

Now leasing time from Christian Voice, Radio Australia reports a "remarkable improvement" of reception in South and South East Asia and even Europe. Surprise, surprise. The schedule is too complicated to reproduce in the remaining space, but if you have access to the Internet go to www.abc.net.au/ra/

Bye for now!

TOM WALTERS HAS MORE NEWS OF SHORT WAVE SERVICES BEING WITHDRAWN BUT ENCOURAGES YOU TO STICK WITH YOUR LISTENING.

wave to North America, Australia, New Zealand and the Pacific. While Radio Canada International, under a new boss, was starting a wholesale review of its programming, amid some outspoken comments from its staff.

So where is this all heading? It doesn't look good, on the face of it. But be of good cheer, I think it really boils down to rearranging the furniture. As the BBC World Service has said in its defence, broadcasters now have a huge array of 'platforms' (modes of transmission) to choose from and they simply can't afford to use all of them to all regions of the world. Among the means which are now available include:

- * Analogue: short wave radio; medium wave; long wave (in a very few cases); commercial satellite; rebroadcast, usually on local f.m. stations; and the Internet.
- * Digital: terrestrial DAB (Digital Audio Broadcast) (existing in some countries, including the UK); the DRM (Digital Radio Mondiale) system, planned to start soon,

serious computer users don't access radio or TV via their computers.

They listen or watch, while simultaneously using the computer. The BBC claims many listeners via rebroadcast, but rebroadcast usually consists just of brief extracts from a stream of programmes. You can't choose what to listen to.

My advice is simple. Stay with your short wave radio. That way, the choice is yours and you can access every station in the world.

You can take your radio wherever you go. You need the

knowledge of how to tune it, but this can be easily acquired. Use the other systems as complementary to radio. Use the Internet for obtaining information, and for backup audio.

Some leading entrepreneurs in the multi-billion dollar international television business have come out and declared recently that it's nonsense to predict the Internet as the TV medium of the future. Television is here to stay, they assert, with the Internet being useful as a backup. Radio too, has stood the test of time, and will remain as the backbone of



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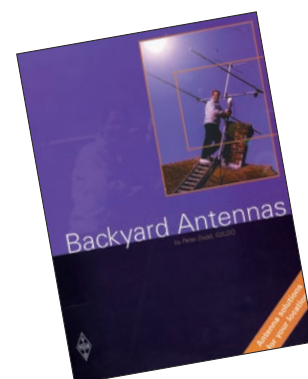
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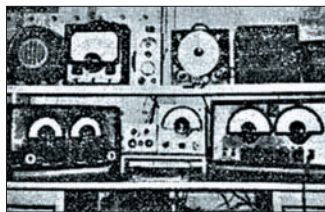
topical **talk**

The photographs and details of G3XFD's new workshop on his Keylines page this month set the Editorial team busily looking through the archives. Why? Because we'd remembered seeing some other interesting photos and stories from magazines dating back to 1965 and 1954.



One particular story stuck in the memory of the two eldest team members (to be honest they probably remember reading it straight off the newsagent's shelves!) was that from the World of Wireless, published in the April 1954 issue of *PW*. And for those who remember enjoying a certain radio programme with one Anthony Hancock playing the part of the hapless 'Radio Ham' - the photocopied story will bring back particular memories!

The story featured **Mr. S. A Faulkner VS2DB** - of the Inland Revenue



Department - based in Kuala Lumpur, Malaya. The relaxed looking gentleman in the photograph was quoted as often being heard in the UK and he used a Grundig 'Reporter' to tape record QSOs and play them back to the distant station. Quite innovative for those days!

Tony Hancock

Although Tony Hancock lampooned our hobby in his Radio Ham sketch on BBC radio (It's definitely better in the radio

version than the television programme don't you think?) if you can't have a laugh at yourself sometimes...where's the fun in life? However, the Kuala Lumpur station is interesting indeed because it was published before Hancock Half Hour featured - an inaccurate but still very funny - look at our hobby. The comedy included the request from the Malayan station asking in a clipped Eton-style voice for a portion of bread pudding, with sugar on top - to be sent air mail to him in Kuala Lumpur!

Coincidence or not? The *PW* team are left wondering if it was the photograph of VS2DB which led to the inclusion of the Malayan station in the comedy programme script written by Galton & Simpson. Does anyone know the truth we wonder? No doubt, if they do...we'll soon hear from them!

Gravesend Den

Another interesting photograph comes from the February 1965 issue of *PW*. This is where a letter and photograph from **Mr. T. W.**

Middleton (who signed himself as 'Ex G2FTM') featured in the reader's letters pages. Living in Gravesend in Kent, Mr

Middleton's shack seems contemporary for the time and shows much equipment which was, according to the story, built from *PW* designs.

And although - according to the Editorial comments in the photo caption - Mr Middleton had for some reason to retire early from his work...he still enjoyed the hobby very much indeed. So, perhaps readers living in the Gravesend area of Kent will remember him and share the story of this obviously keen constructor from nearly four decades ago?

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