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November 2004

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ICOM IC-7800 NEW — £6400 C

HF + 50MHz 200W Transceiver
Latest 'top-of-the-range' transceiver from Icom. 200W output power, built-in ATU and power supply. Two completely independent receivers, four 32-bit floating point DSP units, flexible DSP filter capability. Massive 7in wide (800x400 pixel) colour TFT LCD. Multi-function spectrum scope.

IC-7800-PACK **£6995**
Includes Rig + 17" monitor, keyboard & SM-20 Mic

ICOM IC-756 PRO II — £1899 C

Pride of the Icom range of HF transceivers. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit.

ICOM IC-7400 SPECIAL OFFER — £1299 C

HF/VHF 100W transceiver. Features large LCD with spectrum scope, auto ATU and same DSP system as IC-756PRO II.
Comes with *FREE* SP-21 Speaker & SM-20 Desk mic worth £219.

ICOM IC-706 IIG DSP — £769 C

HF/VHF/UHF mobile DSP transceiver. Its relative small size not only makes it a great mobile rig but also for fixed station use as well. HF general coverage Rx and VHF & UHF.

ICOM IC-703 SPECIAL OFFER — £539 C

START HERE!

HF/50MHz Transceiver 0.1-10W Portable, Mobile, Base Station. (9-15.87V DC) Designed especially for the Foundation Licence/QRP. Built-in features auto ATU, DSP memory keyer. (5W when using 9.6V batts)

***FREE!* Icom 703 Logbook - while stocks last**

ICOM IC-718 — £449 C

HF 100W transceiver. Covers all HF bands plus wideband receive. C/w auto notch, dual VFO, SWR meter etc. Options include extnl ATU DSP & filters.

BUDGET BARGAIN

ICOM IC-910X with 23cm — £1249 C

Icom's all mode VHF/UHF transceiver with 23cm. Large clear LCD with lots of facilities. 100W on VHF and 75W on UHF, 10W on 23cm.

IC-910H version £1099

KENWOOD TS-2000 — £1599 C

Top-of-the-range 100W Kenwood transceiver. HF/VHF/UHF or up to 23cm with the optional module. Built-in auto ATU, DSP and its unique TNC.

TS-2000X + 23CMS £1899

KENWOOD TS-870S DSP — £1399 C

HF DSP 100W base station. Excellent all round rig great for DX working with its ability to winkle out weak stations using its true IF DSP. No filters to buy.

KENWOOD TS-570DGE — £849 C

HF100W base station with built-in auto ATU. Very popular rig, excellent performance on SSB and CW. Two fitted antenna sockets - very handy.

RELIABLE & EASY

YAESU FT-1000 MKV — £2349 C

200W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC PSU - Acknowledged as one of the finest DX rigs on the market. Superb tailored audio and the ability to select Class A bias for dramatic signal purity.

YAESU FT-1000 FIELD — £1749 C

100W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC / 13.8V DC - Building on the success of the FT-1000MkV, the Field has become a respected leader in its class.

YAESU FT-897D NEW — £899 C

100W HF rig plus 2m and 70cms (50W/20W) 13.8V external supply / internal optional FP-30V AC power supply / self powered portable using optional Ni-MH pack at 20W output. Compatible with FC-30 auto ATU and ATAS 120/100 antennas. The "must have" radio for 2003.

Now with TXCO fitted.

YAESU FT-857D NEW — £649 C

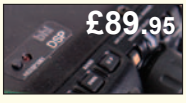
HF/50/144/430MHz Mobile Transceiver HF/6m 100W, 2m 50W, 70cm 20W. (13.8V DC) Developed on the FT-897 and FT-817 transceivers. Built-in features 32 colour display, spectrum scope, AM airband receive, built-in memory keyer, detachable front panel, DSP unit fitted.

YAESU FT-847 — £1199 C

Covering 1.8 to 440MHz, this all-in-one transceiver offers unbeatable value. 100W on HF plus 6m, and 50W on 2m and 70cm. You get genuine RF clipping on SSB for up to 6dB gain and there are 4 seperate antenna sockets.

YAESU FT-817ND — £499 C

bhi DSP Module now available!



160m - 70cms. Up to 5W output all modes. ***Now with Ni-MH battery, charger & DC lead.*** **£589 with DSP ready fitted.**

NEW DSP Module
bhi have produced a lovely 4-stage DSP module that can be fitted inside the FT-817. The module costs £89 (plus a fitting charge of £25 for retro-fitting to existing models). This includes installing a mini switch and LED on top cover.

NEW FT-817 Clip on metal front support stand.
In stock now £14.95 +£1 P&P

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MFJ

In Tune with MFJ...

MFJ-993

*Auto ATU with digital data dis[play*1.8-30MHz *Long wire, coax & balanced line *300W SSB, 150W CW *Cross needle metering *Size 255 x 70 x 235mm *Weight 1.8kg

The auto ATU that has a digital data display and can even handle wires!

£249.95 C

MFJ-991

Similar to the MFJ-993 but handles 150W SSB/100W CW and matches 6-3200 Ohms. Does not have digital VSWR meter LCD readout aural VSWR, antenna switch or 4:1 balun.

Auto ATU

£209.95 B

MFJ-941E

A great budget ATU. All the great MFJ features that make it ideal for base station use. *1.8-30MHz *300W *Cross needle meter *VSWR & PWR 30/300W *Terminals for wires and bal. lines *Internal 4:1 balun *Ext. Dummy load socket *SO-239 sockets *Size 260 x 180 x 70mm

Manual ATU

£129.95 B

MFJ-974H

A true balanced line ATU that is ready made for open wire feeder. Extremely accurate balancing provides optimum performance. It can also be used for long wires and coax. Great for all-band doublets. *1.8-54MHz (MFJ-974H) *300W *Balanced, wire or coax *SO-239 sockets *Size 195 x 155 x 220mm *Weight 2.05kg

£179.95 C

MFJ-904H

Just the job for portable use. It's so small! *3.5-30MHz (80 - 10m) *150W wire, coax, balanced *Internal 4:1 balun *SO-239 sockets *Size 180w x 60h x 80d (mm) *Weight 650g

Manual ATU

Mobile and portable use

£129.95 B

MFJ-962D

Ideal for use with linears. Gandles balanced, coax and wire. *1.8-30MHz *1.5kW Roller Coaster *VSWR meter *6-way antenna/load switch *Buit-in 4:1 balun *2 coax positions *Size: 270x375x115mm

Manual ATU

£279.95 C

YAESU FT-7800 NEW — £239 C

Yaesu's Powerful low cost answer!

* 2m/70cms Dual Band Mobile
* High power 50W 2m /40W 70cms
* Wide receive inc. civil & military airband
* CTCSS & DCS with direct keypad mic.
* Detachable front panel
* 1000 memories plus five one-touch

YAESU FT-8900R NEW — £339 C

Want the best of all worlds then the FT-8900R is just the ticket! A rig with four of the most popular mobile bands - 10m/6m/2m & 70cm. Detachable head. Airband Receive.

YAESU FT-2800M — £159 C

The FT-2800M 2m FM 65W High Power mobile transceiver. Rugged construction, excellent receiver performance and direct keypad entry.

ICOM IC-2200H NEW — £199 B

The IC-2200H is the latest version of this popular high power 2m mobile rig. It has 207 memories inc 1 call channel & 6 scan edge memory channels.

*144 - 146MHz FM *65/25/10/5W RF o/p *CTCSS & DTCS *Green/amber display *Audio: 2.4W o/p *Tx 15A (65W) *Rx 1A (max audio) *Standby 0.8A *Power 13.8V DC *Size: 140x40x146mm

KENWOOD TMD-700E — £449 C

Certainly the best dual band mobile transceiver with APRS. Does not need extra high cost boards to function. The only extra if required is a compatible GPS receiver.

OTHER MODELS...

ICOM			
IC-2725E	Dual Band FM Transceiver	£269	C
IC-2100H	2m 55W FM Mobile	£229	C
YAESU			
FT-8800E	2m/70cm Mobile	£289	C
KENWOOD			
TM-G707E	2m/70cm Mobile	£289	C
TM-V7E	2m/70cm Mobile	£359	C

YAESU VX-110 — £119 B

Combining the ruggedness of the VX-150 with the simplicity of 8-Key operation, the VX-110 is a fully featured 2m handheld ideal for the most demanding of applications. It has a die-cast case, large speaker and illuminated keypad.

ICOM IC-E90 — £269 B

The new E-90 offers triple band coverage of 6m, 2m and 70cms. Up to 5W output and rx coverage from 495kHz - 999MHz makes this a very attractive rig.

ICOM IC-T3H — £129 B

The IC-T3H 2m handheld features tough quality but with slim looks. Its striking green polycarbonate case has been ergonomically designed. The rig is capable of providing a powerful 5.5W output with either Ni-Cad or Ni-MH battery packs. Supplied with charger and rechargeable battery.

KENWOOD TH-D7E — £319 B

DATA COMMUNICATOR

One of the most successful handhelds over the past few years. It has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit. Plus NMEA, 200 memos, and up to 5W output.

KENWOOD TH-F7E — £249 B

WITH EXTRA WIDE RX COVERAGE

- 144-146MHz Tx/Rx: FM
- 430-440MHz Tx/Rx: FM

Up to 6W out with Li-ion battery and "scanner" style coverage from 100kHz to 1300MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

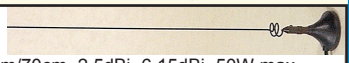
OTHER MODELS...

ICOM			
IC-E208	Dual Band FM Mobile	£279	B
YAESU			
VX-7R	6m/2m/70cm Handheld	£299	B
VX-2E	Dual Band FM Handheld	£169	B
KENWOOD			
TH-G71E	2m/70cm Handheld	£199	B

MOBILE ANTENNAS

WATSON ANTENNAS (PL-259 base type)

Comes with coax & BNC



WSM-270. 2m/70cm, 2.5dBi, 6.15dBi, 50W max, micro-magnetic 29mm base, length 0.46m. **£19.95** A

W-2LE	2m quarter wave 2.1dBi 0.45m	£9.95	A
W-285	2m 3.4dB 0.48m (fold over base)	£14.95	B
W-77LS	2m/70cm 0/2.5dB 0.42m	£14.95	B
W-770HB	2m/70cm 3/5.5dB 1.1m	£24.95	B
W-7900	2m/70cm 5.6/7.6dB	£32.95	B
W-627	6m/2m/70cm 2.15/4.8/7.2dB 1.6m	£34.95	B
WGM-270	2m/70cm On glass 3.7m coax 50W	£29.95	B

MOBILE BASES

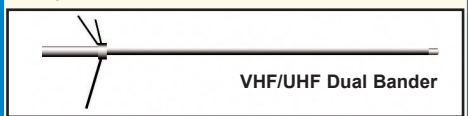
WATSON

WM-14B. Large diameter 14cm magnetic mount SO-239, c/w 5m RG-58 & PL-259

W-3HM	Adjustable hatch mount	£14.95	A
WM-08B	8cm mag mount, 5m cable PL-259	£9.95	A
WM-14B	14cm hvy duty mag mount+cable	£12.95	A
WSM-88V	BNC mag mount plus 3m cable	£14.95	A
W-3CK	5m 5D-FB cable assembly+pigtail	£18.95	A
W-ECH	5m standard cable kit assembly	£12.95	A

BASE STATION ANTENNAS

DIAMOND

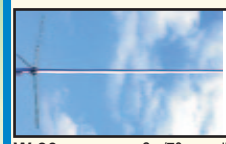


VHF/UHF Dual Bander

X-50	2m/70cm colinear 6/8dB 2.5m	£54.95	C
X-50N	2m/70cm colinear 6.5/9dB 3.1m	£59.95	C
V-2000	6m/2m/70cm 2.15/6.2/8.4dB 2.5m	£89.95	C

CHECK OUR WEBSITE FOR FULL DIAMOND RANGE

WATSON



W-300. Very popular dualband base antenna. Supplied with u-bolts for mast fixing.

W-30	2m/70cm colinear 3/6dB 1.15m long	£39.95	C
W-50	2m/70cm colinear 4.5/7.2dB 1.8m long	£49.95	C
W-300	2m/70cm colinear 6.5/9dB 3.1m long	£64.95	C
W-2000	6m/2m/70cm 2.15/6.2/8.4dBi 2.5m	£69.95	C

WATSON W-25XM PSU NEW — £99.95 B

A compact sized switch mode power supply that will run your base HF station with ease.

*Output Voltage 10 - 18V DC *Output Current 22A / 25A peak *Over current protected *Rubber Feet *Supply 230V / 115V AC 50/60Hz *Switchable dual voltage input *Size 220 x 180 x 73mm *Weight 1.8kg

WATSON W-25SM PSU — £79.95 B

Very popular budget switch mode power supply. *Output voltage 13.8V DC *Output current of 22A (25A peak) *Front panel output terminals *Over current & voltage protection *Quiet operation

WATSON W-25AM PSU — £89.95 C

DC power supply for the shack & esp. for use with 100W transceivers. Separate voltage and current meters. *Output voltage 0-15V DC *Output current of 25A (30A peak). *3 sets of output terminals *10A cigar socket. *Over current protection

CHECK OUR WEBSITE WWW.WSPLC.COM FOR MORE DETAILS OF THESE PRODUCTS

WATERS & STANTON

1973 WATERS & STANTON PLC 30th ANNIVERSARY 2003

PRICE MATCH

VERTICAL ANTENNAS

Hustler Mobiles

Get top performance when on the move. Purchase the **MO-3 base** (137cm) for **£24.95** or the **MO-4 base** (68cm) for **£22.95**. Then add the resonator of your choice. **RM-10, RM-12, RM-15**, all **£19.95** ea. **RM-17, RM-20 £24.95** ea. **RM-40 £26.95, RM-80 £29.95**

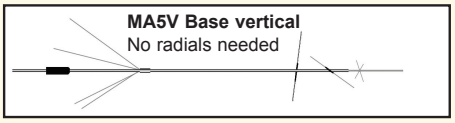
Resonator

Base section MO-3 or MO-4

CUSHCRAFT BASE ANTENNAS

MA6V	20-17-15-12-10-6m 250W PEP	**£269.95**	C
MA5V	20-17-14-12-10m 250W PEP	**£239.95**	C

MA5V Base vertical
No radials needed



R8	40-30-20-17-15-12-10-6m 1.5kW	**£469.95**	C
R6000	20-17-15-12-10-6m 1.5kW PEP	**£329.95**	C

BUTTERNUT BASE ANTENNAS

HF9V-X	80-6m 7.9m 1kW PEP	**£349.95**	C
HF6V-X	80-40-30-20-15-10m 7.9m 2kW	**£299.95**	C
HF2V	80-40m 9.75m (160m opt) 1kW	**£229.95**	C

HY-GAIN BASE ANTENNAS

AV-640	40-6m 1.5kW, 300W 6m (PEP)	**£369.95**	C
AV-620	20-6m 1.5kW, 500W 6m (PEP)	**£279.95**	C
AV-14AVQ	40-20-15-10m 1.5kW PEP	**£169.95**	C
AV-12AVQ	20-15-10m 1.5kW PEP	**£139.95**	C
DX-88	80-10m 1.5kW, 250W 30m	**£369.95**	C

HARI High quality German traps. (Pairs)
200W 20m £44.95 40m £49.95 80m £53.95
1kW 20m £59.95 40m £64.95 80m £73.95

HARI High quality German Baluns SO-239
200W 1:1, 4:1 or 6:1 £25.95 ea.
1kw 1:1 £34.95 4:1 or 6:1 £41.95 ea

HORIZONTAL BEAMS & DIPOLES

CUSHCRAFT

Premier HF beam used around the world by serious DX'ers.

X-7	20/15/10m 7 el. Yagi 2kW	**£669.95**	D

Not got the space for a full sized HF beam antenna, then the mini beam MA-5B should be considered.

MA-5B	10-12-15-17-20m 4 el. Yagi 2kW	**£369.95**	C
A4-S	10-15 & 20m 4 el. Yagi 2kW	**£569.95**	D
A3-WS	12 & 17m 3 el. Yagi 2kW	**£379.95**	D
D-3	10-15-20m dipole element 2kW	**£249.95**	C

Don't want a wire antenna but can't fit a Yagi, then consider a rotatable dipole.

D-3W	12-17-30m dipole element 2kW	**£249.95**	C
D-4	10-40m dipole element 2kW	**£349.95**	C
D-40	40m dipole element 2kW	**£319.95**	C
TEN-3	10m 3 el. Yagi 2kW	**£229.95**	C
ASL-2010	13.5-32MHz 8 el. log periodic	**£749.95**	C

RADIO WORKS

A choice of quality wire antennas available to fit almost any circumstances.

CW-160	160-10m 76.8m long	**£129.95**	C
CWS-160	160-10m 40.5m long	**£119.95**	C
CW-80	80-10m 40.5m long	**£89.95**	C
CWS-80	80-10m 20.1m long	**£109.95**	C
CW-40	40-10m 20.1m long	**£84.95**	C
CW-20	20-10m 10.36m long	**£89.95**	C
CW-620	20-6m 9.7m (32ft) long	**£89.95**	C
G5RV PLUS	80-10m with balun 31m (102ft) long	**£59.95**	B

YUPITERU MVT-3300 SCANNER £129 B

The MVT-3300EU covers most of the useful bands in the VHF and UHF spectrum. It has 200 memories as standard with a range of band and security channels as well. It has functions normally associated with more expensive sets such as pre-setting the receiving mode and frequency step, Duplex reception with "One Touch" function, Auto-Write and Search-Pass memory functions. There is also a Decipherment function to receive certain scrambled communications.

WATSON FC-130 Freq. Counter £59.95 B

SPECIAL PRICE

The FC-130 is an ideal frequency counter for the shack, mobile or portable use. Supplied complete with Ni-Cads, charger and telescopic whip.

WATSON BASE ANTENNAS

Unbeatable Value!

Model	Freq	L(m)	dB	Price
W-30	2/70	1.15	3/6	39.95 B
W-50	2/70	1.8	4.5/7.2	£49.95 C
W-300	2/70	3.1	6.5/9	£64.95 C
W-2000	6/2/70	2.5	2/6/8.4	£69.95 C

These antennas are solidly made of fibreglass, die-cast alloy and stainless steel. Guaranteed lowest prices in the UK.

Totally weatherproof
Pre-tuned & Unbeatable

MFJ-971 QRP Portable ATU £99.95 C

*1.8 - 30MHz *300W/30W/6W selectable *Cross needle meter *12V DC Ext. *SO-239 sockets *Tunes wire, coax, balanced line *Terminals & earth post *Size 160 x 150 x 60mm *Weight 870g

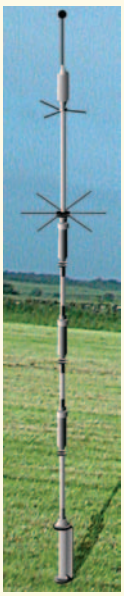
The MFJ-971 is the ideal QRP ATU to have on hand. It incorporates a cross needle SWR meter and displays forward or reflected power and SWR simultaneously.

HUSTLER ZERO SPACE DX ANTENNAS

No Space Needed!

"Ground Level Wonder"

Run full legal power - 80m to 10m
No masts or guys.
Low VSWR 50 Ohm feed.



These HF verticals will take **1kW of power**, work at **ground level**, and are **self-supporting.** A single earth rod will get you going. Add buried radials for even better results. These are **rugged, well-built** antennas that American hams have been using for years. Now they are available in the UK from our three stores.

4BTV		
40-20-15-10m. 6.52m high.	**£149.95**	C
5BTV		
80-40-20-15-10m. 7.64m high.	**£179.95**	C
6BTV		
80-40-30-20-15-10m. 7.3m.	**£209.95**	C

NOTE: 80m coverage limited to 100kHz on 5BTV & 6BTV

YAESU VR-120D £139 B

The VR-120D handheld scanning receiver covers from 100kHz to 1300MHz. AM/FM/WFM modes (inc. preprogrammed broadcast freqs). The VR-120D's small size and tough polycarbonate case allows you to take it anywhere -hiking, skiing or while walking around town. Power is provided by 2 x AA batteries (not supplied). Ni-Cad batteries and charger are available as options.

RIGBLASTER-PLUS

The Adventure Begins!

~~Was £139.95!~~
£119.95
Order as RB/PL/C

New Low Price!! Explore all the new digital modes. All leads provided for computer and radio. Just connect between PC and transceiver. Plugs into 8-pin and RJ-45 radios. Internal jumpers to match your radio. Software on supplied disc for CW, RTTY, PSK-31, SSTV, Packet, AMTOR, DVkeyer, WSJT, Mic EQ, Rig CTL, EchoLink etc. Requires 12V DC

NOMIC Similar to above but no 8-pin front panel socket and no CW keyer function. Self-powered. **£59.95**
Code: RB/NO/CU for 8-pin rigs and for RJ-45 rigs

HEIL QUALITY MICROPHONES


HCL-5/4


GM-4/5


HST-817


PROSET +

Desk Microphones

HCL-5/4	Classic retro-look HC-5/4 desk mic	**£199.95**	B

Hand Microphones

GM-4/5	Goldline HC-4/HC-5 hand mic	**£109.95**	B

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Cover subject

As 'light as a feather' sums up the new Alinco DJ-C7 hand-held, giving us the perfect excuse to borrow a set of scales (kindly loaned by The Pharmacy, Boots The Chemist, Wimborne, Dorset) to produce this perfectly balanced front cover photograph.
We hope you enjoy this packed issue and the free *Antennas to Go* supplement. Until next month - happy radio reading!

Design: Bob Kemp
Photograph: Tex Swann G1TEX/M3NGS

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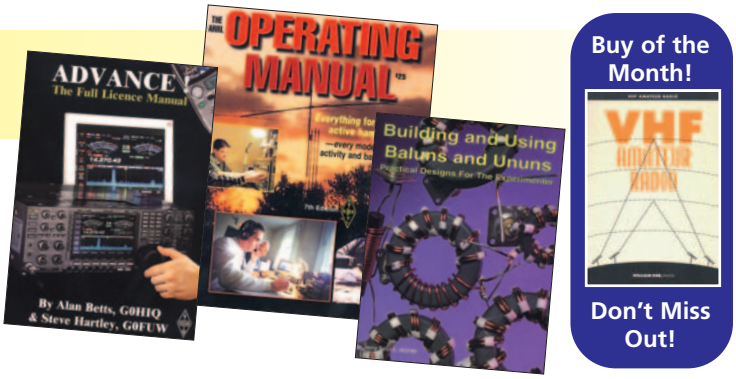

Page 70. The biggest and best selection of radio related books anywhere!

November **regulars**

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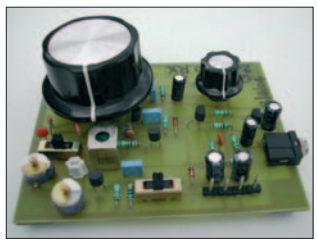

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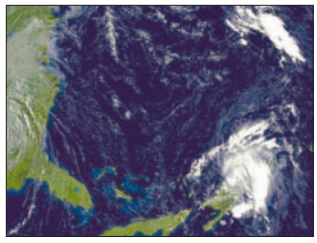

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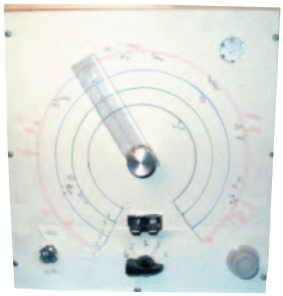

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ANOTHER PACKED ISSUE

rob mannion's keylines

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

Feedback is essential for efficient operation! However, I'm not thinking about increasing the gain in a radio frequency or intermediate frequency amplifying stage - although of course it's often essential there too. Instead, this time I'm thinking in this instance of the feedback from *PW* readers...especially that published in the Radio Waves section of the magazine.

The 'letters' pages offer our readers a powerful form of expression and it's a 'soapbox', which I insist must be as fair and balanced as possible. That's why - as an ethical journalist and dedicated Editor - I think it's essential to publish both brickbats and bouquets! It's the only way that those of us stuck way down in the remote southern fringes of the UK (England finishes just a mile or so way from where I now sit...and it's very wet if you venture further!) can get to know just what you, our valuable readers think.

In the 15 years I've been Editor of a magazine I truly love (I first read it at the age of eight) it's been my goal to ensure that *PW* does not appear to be a publication produced by a remote publisher or heavyweight committee and appears as a dusty, obscure and anonymous journal. Instead I feel the magazine is responsive and *PW* reflects your likes and dislikes as efficiently as possible. The editorial staff also strive to achieve the best editorial 'balance' as possible.

I urge anyone who has never voiced their opinion to do so! The vast majority of our readers are silent - and it's your opinion that counts and we need lively debate - so please write in to tell us what you think. I thank everyone who has already written so far - your advice, suggestions and criticism is much appreciated. It's also extremely valuable as many articles/ideas and projects have come direct from readers. I also welcome the chance of a personal 'face-to-face' chat when I visit clubs, rallies and conventions. But keep the letters coming please!

Several of the writers of the most critical letters received recently have received copies of our *Author's Guide* - literally by return of post. Accepting their criticism I've suggested that along with noting their comments, they can help themselves - and other readers by preparing something along the lines they've suggested.

Personally, I think that some of the writers who have criticised my efforts have done so in a constructive way and given the chance - will also prove to be excellent authors. They've certainly got some good ideas and to a certain extent I've 'deflected' the energy of their criticism towards the production of what I hope will be some excellent articles for *PW*.

For further discussion on *PW*'s editorial content - particularly the Radio Basics series - I ask readers to join me in the Topical Talk section - page 77.

Fiction Yes/No Votes

By the time this issue of *PW* arrives on your doormat or on the newsagent's shelves - the 'Fiction in *PW* Yes/No' voting opportunity will have closed. And although I can't pre-empt the final result and must leave my comments until all the votes are in - I must say how surprised I've been with the comments received so far. At first there was a rush of votes for one opinion, with a trickle for the other. However, the tide reversed and another rush took it the other way! It's all been rather fascinating I can tell you!

Onlooker: "Rob's at it again...trying to balance both the content of *PW* and opinions. I hope he can manage it - with reader's help"!

Finally, on the topic, I thank everyone who has voted. The comments (both 'for' fiction and 'against' fiction) have often been accompanied by some interesting suggestions and ideas. As I've said before...feedback from readers, which we can act on is essential!

Calling 'CQ' Lorry Drivers!

I'm now calling 'CQ' to Radio enthusiasts who are either lorry drivers or who have connections with the transport industry. Amateur Radio needs your help! This is because **Tennamast (Scotland) Ltd.**, run by **Norrie GM4VHZ** and **Rose Brown**, based in Beith, Ayrshire in Scotland are having difficulties transporting their superbly built masts at a viable cost.

The problems arise because Tennamasts are so well built they're heavy! The transport problems, along with the steep increase in the price of steel recently is making the manufacture and delivery of the masts difficult. Tennamast's core business is boat trailers nowadays but Norrie is keen to continue making the masts...provided he can get them to customers!

Can you help - do you know of a company who could transport the masts? Could your company help? If so, you could help a superb Scottish product remain viable - to the benefit of everyone in the hobby who requires a well engineered mast. If you can help - or have suggestions - please contact **Norrie Brown GM4VHZ, Tel: (01505) 503824** or myself at the *PW* offices. I'm sure someone will have the answer! Cheerio for now.

Rob G3XFD

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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.

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. See page 72 for details.

Placing An Order

Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., 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 **0870 224 7830**. 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 **0870 224 7850**. The E-mail address is **clive@pwpublishing.ltd.uk**

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.

amateur radio waves

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

The Star Letter will receive a voucher worth £20 to spend on items from our Book or other services offered by *Practical Wireless*.

Reference - 'Gobbledygook to This M3'

● **Dear Sir**

Firstly, I stand to be corrected, but I think that the above term 'Gobbledygook' is spelt correctly. However, this may have been an error by the editing staff!

I'm mentioning the term because I'm somewhat dismayed by the comments of **Mr. Edward Summers** in the September issue. I am assuming he has some interest in being a Radio Amateur and has successfully completed some form of study for his 'M3'. However, in order for him to have achieved his current status, standards have been reduced to allow people to take advantage of the hobby much sooner than has been allowed in the past. Unfortunately, the penalty you then pay for obtaining a lesser qualification generally results in less understanding of the subject.

Additionally, I assume that Mr Summers realises that an M3 licence is something that was made available to allow people to enjoy additional facilities in the Radio Amateur field whilst continuing their education to achieve a more advanced status? This type of action inevitably results in anomalies, which should cease to exist if the envisaged program anticipated for Radio Amateur advancement is followed.

Having had so many concessions given to him, it's sad to see that Mr Summers has the audacity to actually expect more. It isn't difficult to spend a little more time to come to grips with the issues at hand. My wife Ann did it in 18 months, where she progressed from no more knowledge than High School Physics to a full A licence - and she's a real blonde...obviously not of the 'dumb' variety!

I believe that Ann **F5VBX/G0SYH** will also come within the same educational band as Mr Summers, which has to be a consideration. My wife found from first hand experience that due to the erosion in Educational Standards in the UK she had difficulty with some of the mathematical aspects whereas I didn't, being of a different generation. Here I am referring to General Education and not Advanced Education although from my experience the same problems exist in that area!

May I remind the gentleman that although he cites circa 3000 M3s expected this year, he should also consider that *PW* is produced for the whole Amateur fraternity, not specifically M3s. To my knowledge, there are over 62,000 licensed Amateurs in the UK alone, of varying skills, but the idea is to be prepared to learn and better your knowledge, not grizzle at the first stumbling block.

I'm also dismayed at the comment that M3s were "just flung into the Radio World". Their choice was a conscious decision of their own, and if there isn't the will to improve their understanding then perhaps they made the wrong decision. If the content of the magazine is above the level of understanding of this particular Amateur, then may I suggest he either improves his understanding or reads another periodical.

There are many clubs, works of reference and courses that can assist in this field. It should not be the aim of *PW* to teach people detail that used to be part of the Radio Amateur Syllabus and is still available for evening study at most Radio Clubs.

From a personal viewpoint, I find many of the articles in *PW* too basic, but then I have spent a life in electronics. I would suggest that the current content is aimed at a 'general reader' and those that find it difficult can do as many of us 'older hands' did when we started, have a chat with a more knowledgeable Amateur for answers. This would serve to further improve their understanding as someday, a young Amateur may well ask them the same questions!

As a very active operator on the h.f. bands I don't find the comments published in the September issue truly representative of the M3 fraternity. Generally, they are prepared to further their knowledge and when in doubt, are quite prepared to ask. Perhaps Mr Summers should continue with his studies for advancement in the Radio Amateur field where he will find much of the knowledge he seeks? He could also help to resurrect the old Amateur practices of discussing technical aspects on the air, which would help to further his knowledge. I am always happy to talk about technical matters and problems and can be found on 7 or 14MHz many times doing just that! I look forward to working *PW* readers on the bands, especially 7MHz.

Tony Dolby F5VBY/G3TZH
Tarn-et-Garonne,
France

Returned To Radio Hobby

● **Dear Sir**

I returned to the hobby of radio/radio construction a few years ago. I had been into motorcycles for many years, but felt I was getting too old for that! I gutted my shed/workshop, removed the steel benches and built new wooden ones. Slowly I've built up stock of capacitors, resistors, etc., and being unfamiliar with more modern components, taking time to find out all that I could.

Many years ago I built crystal sets, and one and two valved recievers - this was what I wanted to get into again. My late father was keen on radio and had a large stock of (even then in the 1950s and 1960s) obsolete items, including several R1155s and I still have an R1155F I acquired via a friend of my father-in-law.

I find it difficult to find diagrams of crystal sets, but eventually did via the Internet. After building several small transistor kits (the best came from Quasar Electronics) some were - even after returning to supplier for 'tweaking' - as good as useless. I also 'scratch built' a receiver from parts I had 'on the shelf'. However, what I really wanted to build was a valve set!

At last I found a diagram and all the parts. After hand winding the coils, the prototype was built on a wooden chassis. Fantastic results in both my eyes and ears! Recently I finished the 'final example' after purchasing some off-cuts of aluminium from a place in Dundee and made up a 'proper' chassis. I took time to allow for size and position of components and before building fitted a wire brush in my vertical drill to give the panels a professional finish.

Where is all this leading? Well, I feel there must be a lot of constructors like me at the younger end of older who need *PW* and want to construct. Put a few parts together and hear the sound of your own efforts....that's what it's all about. Like me, they don't (and perhaps don't want to) know too much about the theory, wave formation or what have you. We do know a little, can read a theoretical circuit diagram and can build from it.

I see interesting small projects in the *PW* from time-to-time and I'm usually short of one or two components. It would be good if someone out there did a kit for these projects, not just a printed circuit board. It would also be great if someone did a kit for a proper h.t. supply unit that the valve jobs need. Not the inverter/oscillator type - I've tried those!

At present for h.t. supplies I use 10 x PP3 batteries - to be fair they stand up very well, but for my next set I'll need a 'proper' h.t. supply. I suppose I'm lucky (I didn't want to appear big

headed!) that I posses the skills to do what I do regarding the chassis building, etc. Unfortunately, there are many that want to, but can't. Again, I think there's a role for the type of supplier I've mentioned, but do I expect too much? Ah well, I've got it all off my chest!
Denis Speirs
Arbroath
Scotland

Balance & Content of *PW*

● **Dear Sir**
I am a 47 year-old medical professional, now retired after serving in the specialised armed services. I have been reading your magazine for years now, and so has my son aged 13. We most certainly enjoy the **balance** of the content, long may it continue!

We like the new and adore the old. Have you ever seen a 13 year old's face light up at seeing a tube radio 'light up'? I feel sorry for **Mr Len Paget GM0ONX** (Letters, page 11 October *PW*), while respecting his opinions, because I feel they miss so much with the continuous drive to 'all inclusive computer control' and all things 'automatic'.

My son and I have 12 valved receivers and seven high tech 'modern' ones. The transceivers range from FT-101ZD to FT-1000MP MkIV and FT-847, totalling 15. Why? Because we love the hobby and the discipline with all its diversity. (Okay, I admit we like to collect!).

There is - on occasions - no better fun than running a 'modern' receiver side-to-side with a valved unit. (Results are sometimes **very** surprising!). We like to experiment with 50 year old antenna designs compared to our own (bad) and commercial units. This is what the hobby is about isn't it?

Keep up your excellent efforts *PW*, other (computer, etc.) magazines exist for the people that consider Radio Amateurs as techno-dinosaurs. Best regards from a grateful family - including Emma who's also becoming interested in radio.
Etienne & Philip Swanepoel
Bude
Cornwall

Television Tetra Immunity

● **Dear Sir**
I would comment on two things in the October issue of *PW,* which I found of interest. Firstly, there's the lady who didn't think she ought to pay to make her TV immune from the Tetra emissions (news story, courtesy of **Trevor M5AKA**; 'Amateurs Not To Blame', page 15). It is a sad thing that people are sold equipment which are wide open to all the transmissions in their environment - but it does happen. Put it like this.... If you leave your front door open and a sneak thief comes in who is to blame? Primarily the thief but the householder must bear some responsibility!

There's the other case where someone moves into a house near to an Amateur, and though their equipment may have been clean in his previous residence, it now picks up the Amateur signals. He can't blame the Amateur if he didn't 'do his homework' before moving.

In a similar case where some land had been used on occasions for a particular purpose for 24 years, someone moving into a new house nearby complained and that finished up as an harassment case. But the Amateur, as a licensed user is to a great extent fireproof.

The other item was the sub-heading in the Antenna Workshop, "No TVI or BCI" ('The Utilitarian - A 3.5MHz Band Antenna by **Richard Marris G2BZQ**, page 47), per se, do not cause either of these conditions provided they don't have any faulty connections ('rusty nail effect' - with the possibility of rectification).

What some antennas can do is to accentuate the spurious signals from the transmitter...but that is not the fault of the antenna. The solution resides in a good filter.

Equally, due to positioning, the spurious signals can be generated due to non-linearity in the offended equipment including radio recievers, TV receivers or maybe hi-fi audio equipment and telephones. Again that equipment is to blame and filtering is the answer. So, don't let us propagate the idea that antennas are to blame!
Stan Brown G4LU
Oswestry
Shropshire

Olympics Outshone By Lighthouses

● **Dear Sir**
I am at the best of times only an occasional operator. However, as my holiday this year on the Greek Island of Zakynthos happened to coincide with The Olympic Games in Athens and The International Lighthouse event, I thought I would take along some Amateur Radio equipment. I didn't get to see much of The Olympics....but The Lighthouses provided fun over a few days of casual on-the-air operation.

Using only 5W s.s.b. to an 25m (84ft) W3EDP antenna strung between the olive trees, and with a 5.2m (17ft) counterpoise and the excellent LDG Z-11 tuner, I managed to work all round Europe. I have to thank all those operators who managed to dig out my signals on 14, 18 and 21MHz in less than ideal conditions. They remind me why I got involved in The hobby in the first place!

I started off using the special prefix for The Olympics, J42004. This proved complicated for some, especially under weak signal conditions, so I reverted to the more conventional SV8 which proved less confusing!

Dumbed Down?

● **Dear Sir**
I used to be a subscriber to *PW* until a few years ago, I stopped when the content was 'dumbed down' in an attempt to encourage the less technically minded newcomers to the hobby.

I recently had the opportunity today to read the October 2004 edition belonging to a friend, and could only drop my jaw in amazement at the article starting on page 26 on building the 'Radio Basics' resistance/capacitance bridge project. I was flabbergasted at the dreadful standards of construction that the Editor advocates in the article. If this is the sort of example that is being set to newcomers to the hobby then what hope is there for the future of the electronics and radio industry?

I appreciate that not all constructors have access to workshop facilities. However, the shoddy soldering, sub 11-plus standard woodwork and laughable use of hot glue quite frankly defies belief!

I was an avid reader of the magazine during the 1970s, how standards of construction have dropped since then! The founding Editor F. J. Camm must be spinning in his grave. I have a good mind to attach a reel of 18s.w.g. copper wire to him and some magnets to his headstone - the resulting electricity generated will probably be sufficient to power every single receiver designed by **F. G. Rayer G3OGR** whose designs I aspired to all those years ago.

What treats do we have in store next month? a crystal set held together with 'NoNails' and Gaffer tape?

I work in the r.f. manufacturing industry and it is lamentably difficult to find people these days who are skilled enough to build and test equipment to the high standards required. It seems everyone wants to work in the IT industry these days!

I feel (along with many of my colleagues, some of whom are also former readers) that there is a gap between the simple projects for Novices (who must be encouraged as they are the future of the hobby) and the nostalgic articles for the 'old timers'.

The reprinting of older projects is a good idea - but many are hard to construct due to difficulties in sourcing components. Here's a thought, why not get someone to re-interpret some of F. G. Rayer G3OGR's old designs using modern components where necessary? That would result in some interesting projects, which could easily be built at home and give excellent performance.
Jon Robson G7MQL
Etchingham
East Sussex

Editor's comment: Thank you for your comments Jon - please see Keylines page 9 and also Topical Talk on page 77.

Incidentally, my successful operations in Greece also served to suggest how poor my antenna system at my home QTH has become. So, I think a major rethink is in order here too! I recommend you take some compact gear when you're on holiday - it's truly amazing what you can achieve.

Peter Norman G0PKS
Wellington
Somerset

Editor's comments: That's the trick Peter - getting the most out of our flexible hobby...well done!

Getting to Know You!

● **Dear Sir**

Although we haven't met I'm starting to feel as if I know you just through the pages of the magazine. May I thank you and your staff for the great work you all do. When I was considering taking my M3, yours was the first publication I picked up and I haven't stopped reading!

Having just finished reading September's *PW* your Topical Talk being the last article, I've started to wonder why the complaints about the technical level in some of the articles. As an M3 I am of course very recent to the world of radio. However, once I left school I did gain a BTEC National Diploma in General Engineering, so you could say I have a good basic understanding of the way things work.

We did not however, even touch on transmission lines, etc. during the two year course. I freely admit that I find some articles (and quite a bit of the maths hard to follow), but in my humble opinion, what would be the point of keeping everything basic and simple? It's only by exposure to the more complex parts of the hobby that we can be encouraged to improve both the performance of ourselves and our stations.

I enjoy the Doing it by Design articles by **Tony Nailer G4CFY**. I may not always fully understand them, but they encourage me to think of what I should be studying. I am looking forward to the upcoming 'scope' project as I require one for my bench and what better way to understand it than to build it! This will also be my first venture into valves, having been brought up in the transistor age, so gently does it with the h.t. please!

Please keep up the excellent work - I can't wait for my next issue. Being off work now for two years and very restricted in the activities I can undertake due to health problems, the new *PW* each month is always a highlight.

Finally, I hope to be taking my 2E very soon. My Scouts in Ringmer, four of whom are now also M3s (it must be catching) also enjoy the read. So, if 11-14 year olds can manage it, so should the rest of us! Best wishes.

Tim M3EYP
Lewes
East Sussex

***Editor's comments: Pleased to meet you through PW* Tim. Let's hope we meet up face-to-face soon and good luck with your 2E examination!**

Maintaining Interest

● **Dear Sir**

Len Paget GM0ONX's 'Editor Living in The Past' letter (October 2004) echoes my own point of view. I agree completely with Len and feel that in order to maintain the interest of the old, new and future Radio Amateurs and the continuance of *PW* we must follow his advice. I can get all the fiction I need elsewhere without *The Vectis Run* and the **Charles Miller** memories have ceased to be interesting.

I like the adverts, the news, the DXpeditions; I've read the Editor's comments on equipment reviews, but I find them very interesting. All the 'basics' types of articles are essential for topping up and refreshing our knowledge and in teaching many the basics of their hobby. Nowadays most operators will buy their equipment off the shelf but the essential element of the station, the antenna, is often neglected.

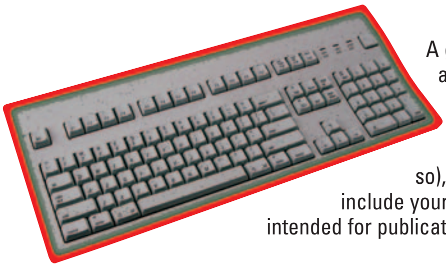
Why not place on the Internet a questionnaire requesting suggestions for the content of *PW* as this might awaken the silent majority of which I'm one. This is the first time I have written to *PW*. The magazine is an institution and I, and I guess many others, look forward to it every month, let's make sure it serves all of us well.

Bill Douglas G4NTW
Sacriston
Durham

Editor: Thank you for your comments Bill. Please see Keylines on page 9, and Topical Talk on page 77.

● 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 callsign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'. **Editor**

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.

October 17
Northampton Radio Rally
Contact: Gary
E-mail: g6nyh@aol.com
Tables for exhibitors free of charge (one table per exhibitor).

October 17
Blackwood & DARS Rally
Contact: George 2W1JLK
Tel: (01495) 724942
To be held at Newport Centre, Newport. Doors open 1030 for disabled visitors, 1045 for all others (traders from 0800). Entrance fee is just £1.50 and parking is free. The centre is one mile from J25A on the M4 or J26 travelling west to east. Refreshments and bar facilities will be available. There will be all the usual attractions, traders and a Bring & Buy, etc.

October 24
The Galashiels & District Amateur Radio Society's Annual Rally
Contact: Jim GM7LUN
Tel: (01896) 850245
E-mail: gm7lun@qsl.net
Held at The Volunteer Hall, St. Johns Street, Galashiels, Scottish Borders. Doors open from 1100. There will be traders, a Bring & Buy and refreshments.

November 6/7
The 18th North Wales Radio, Electronics & Computer Show
Website: www.nwrrcw.org.uk
To be held at the North Wales Conference Centre in Llandudno. Doors open at 1000 on both days.

November 14
The South Yorkshire Repeater Group's Northern Hamfest
Contact: Ernie Bailey G4LUE
Tel: (01226) 716339/(07984) 191873 between 1800 & 2000.
The South Yorkshire Repeater Group are holding the Great Northern Hamfest at the Metrodome Leisure Centre, Queens Road, Barnsley, South Yorkshire. Doors open at 1000. The leisure complex is in the town centre and is less than two miles from J37 on the M1 motorway, just five minutes walk from the train and bus station (follow the brown Metrodome signs from all directions). The venue is all on one level with excellent disabled facilities. Featured will be all the usual trade stands, component and specialist interest groups, along with a large Bring & Buy. Admission is £2.50.

December 5
The Bishop Auckland Radio Amateurs Club (BARAC)
Contact: Mark G0GFG
Tel: (01388) 745353
Taking place at Spennymore Leisure Centre. Please note that this venue is ideally suited for both trader and disabled visitors as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer and electronics, plus a Bring & Buy stall as well as catering and car facilities. More tests are available on demand. As you can imagine, there is a lot to do for all the family within the confines of the Leisure Centre for those of the family not interested in radio. Doors open 1100 (1030 for disabled visitors) and admission is just £1 (under 14 free of charge with adult). Talk-in on S22.

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.

amateur radio news

A comprehensive look at what's new in our hobby this month.

Advance Rally News

Yeovil QRP Convention

The 2005 rally season may seem like a long way off but preparations are already being made for the Yeovil ARC's QRP Convention!

The **Yeovil Amateur Radio Club** have booked the Digby Hall in Sherborne for their 21st QRP Convention, the popular 'get together' of QRPers from the South and West of England. Taking place on Sunday 10 April 2005, doors open at 1000 and car parking will be free in the Town centre car parks which adjoin the Hall (follow the black and white Town Centre signs off the A30 Yeovil to Salisbury road).

There will be two talks in the morning and another after visitors have enjoyed the excellent food available and taken a look around the trade stands. The Construction Challenge will be adjudicated during the convention and certificates will be presented to winners of the QRP Convention 'CW Funrun', which takes place prior to the Convention on the evenings of 14-18th March.

For details on how to take part in the 'CW Funrun', Constructors Challenge or the Convention please E-mail: **george@mudford.fstnet.co.uk**

News and Discussion Forum

Amateur Radio UK

A new website has been launched featuring an open news and discussion forum run by Radio Amateurs for Radio Amateurs.

Amateur Radio UK (ARUK) has been set up by **Steve 2E0NSP** and like minded individuals with the aim of becoming the UK alternative to sites such as the American **www.eham.net**. It's hoped that the site will reinforce the traditional Amateur Radio spirit and encourage young and old alike to further their own 'self training in communication by radio telecommunications'.

Whether you are licensed or not or what your preferred mode of operating is it doesn't matter, as the aim of ARUK is to encourage the true spirit of Amateur Radio and share the common interest of the 'magic' involved. To share your views opinions and experiences with others log onto **www.aruk.org.uk**

So why not join in? Who knows, your contribution could help a fellow enthusiast.

Cover Up & Protect

Set Protectors

Have you ever pondered how best to protect your radio from dust, prying eyes and general battering? Ponder no more... M3SNR has a solution!

Shaun Rennalls M3SNR has come up with an innovative solution for protecting your radio equipment with the launch of his Set Protectors. Being a radio enthusiast since 1979 together with an interest in electronics, Shaun was all to familar with the problems facing enthusiasts.

The Set Protectors range includes covers for base stations, CB rigs and pouches for hand-helds and detachable front panels. The covers are made from high quality velour for a quality finish and because velour is porous and disperses heat after the radio has been switched off (although they should not be put on very hot equipment until it has cooled slightly). The covers in the base station range are currently available for Alinco, Icom, Kenwood and Yaesu radios.

The pouch covers are designed for the detachable front of the Icom 703/706 but will fit various other models such as the Yaesu FT-857. The pouches can also house hand-helds, as well as a whole range of other items such as spare power leads, microphones and fittings, etc. made from padded velour and have a Velcro fastener.

Shaun's products can be bought from his appointed agents, **Waters & Stanton PLC (01702) 206835** or direct from Set Protectors UK at:

68 Bradley View
Holywell Green
Halifax
West Yorkshire HX4 9DN
Tel: (01422) 373105
FAX: (01422) 373105.
E-mail: info@setprotectors.com
Website: setprotectors.com

Beams & Poles

Get a Buzz from SOTA

Summits On The Air Beams are well known for their 'super-light' 144MHz portable beams and poles and they've now added more products to the range.

The WASP Special is the latest product to be added to the SOTA Beam range and is an extension pole system that allows a SOTA Beam to be mounted on top of a LEKI walking pole. The WASP (short for Walking and Skiing Pole Special) uses a bracket system that integrates it with a SOTA Beam to make a convenient package that can be carried up to hilltops. It also comes complete with a snap-on guying system to make installation easy.

The AT Paddle has also been added to the range and is thought to be the ultimate answer for portable c.w. operation. The paddle is very light and as the contacts are well protected, it works well even in the rain (which has been quite an advantage this Summer!). Both the WASP and the AT Paddle are available by mail-order at **www.sotabeams.co.uk**

New DAB Radio

Purring in Pink!

The DAB radio market just keeps on growing with plenty of innovative, interesting receivers available.

The recently launched Intempo KT-01 DAB Digital Radio has been designed with simplicity in mind and nicknamed 'Kitty'. It automatically tunes into the nearest available digital radio station at flick of a button.

An l.c.d. screen displays station and programme information. There are eight presets available so you can programme your favourite stations, an alarm, clock, sleep function, f.m. and DAB, making Kitty excellent value for money.

The KT-01 can be battery or mains operated and if pink isn't your colour it's also available in Charcoal with the same features and price tag of £79.99. For more details contact Nevada on **023-923 13090** or visit: **www.nevada-radios.co.uk**

If you're interested in reading more on DAB look out for our stablemate magazine *Radio Active*, November issue as there is a free 32 page *Practical DAB* supplement being given away. On sale **now** priced £2.75.

Silent Key

James Mealey G0LBF

Don Atkins M1BUL pays tribute to G0LFC a member of the Southport & District ARC.

Don writes: It is with considerable sadness, I notify you that **Jim Mealey G0FLC** a member of the **Southport & District Amateur Radio Club**, died in Southport General Hospital on 27 August 2004. Originally from Liverpool, Jim and his family settled in Southport some five years ago, following a number of operations, which left him permanently confined to a wheelchair.

He was an enthusiastic Amateur Radio operator, always willing to help newcomers to the hobby and the more experienced Amateur alike. He contributed regularly at club meetings and supported all our special event stations where frequently, he was the 'club voice' newcomers, particularly children, heard when they made their first QSL contact.

Jim was a good man, giving generously of his time and advice in his effort to attract new members to the Southport club and to the hobby in general. He seldom complained of his own physical disabilities and was quick to react to the plight of others. He will be sadly missed by the club and the numerous friends he made both in this country and overseas.

He leaves a wife, **Janet**, daughters **Eileen** and **Elaine**, a son '**Jimmy**' and six grandchildren on whom he doted and it is to them we extend our sympathy at this difficult time.

Don Atkins M1BUL
Hon Secretary, Southport & District ARC.

Awards

BARTG News

The British Amateur Teledata Group has announced the last in its series of continental awards.

The Oceania award completes the continental awards series from BARTG. The award is available in three classes: Class 3 is for 10 countries; Class 2 is for 25 countries and Class 1 is for 45 countries. The claim can be endorsed as **All RTTY** or **All p.s.k.** or can be mixed digital modes. You can also claim single band, or mixed bands.

There are three methods of claiming: 1: Submit the relevant QSL cards, 2: Submit a list of countries worked, endorsed by two officials of a recognised club or organisation and 3: For countries worked in one of the BARTG RTTY contests. Awards cost £6, $10 or 10 Euros.

For the full rules, please see the awards pages on **www.bartg.demon.co.uk**. Applications should be sent to **Phil Cooper GU0SUP**. Queries can be E-mailed to: **pcooper@guernsey.net**

Japanese Amateur Radio

Unique Link-up

Kenwood's Head Office in Japan recently demonstrated the Internet-linking of Amateur Radio from the JA Amateur Radio Show in Tokyo.

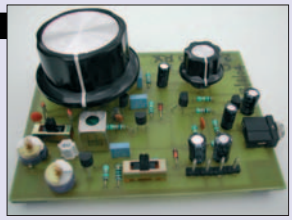
Using two PCs with separate Internet lines and Kenwood's own free Windows software, many visitors to the JA Amateur Radio Show in Tokyo were connected to four matching TS-480s at Kenwood offices in the UK, Los Angeles, Singapore and the factory in Yokohama. They were not only able to fully control and tune the radios, but to listen to signals off-air in real time from these far-flung locations as well. Staff members at Kenwood UK were proud to be chosen as the only European country chosen by Japan to take part in this unique link-up.

The picture shows the set-up on the stand in Tokyo – the left hand PC has a special pad for a video editor tool, which enabled frequency change via its rotary knob. Although the demonstration radios were receive-only to avoid any licensing issues, any normal TS-480 can be operated via the Internet in both receive and transmit modes.

For more details on the TS-480 or any other Kenwood product contact Kenwood UK on **(01923) 655284**, or your local approved Kenwood dealer.

Walford Electronics

Kit Collection



Enthusiastic kit builders will be pleased to hear that Walford Electronics have added three new kits to their range, all of which are available now!

The **Catcott** is a regenerative tuned radio frequency (t.r.f.) receiver for the 3.5, 7 and 14MHz bands. Supplied complete with very detailed instructions, the Calcott is aimed at enthusiasts just starting serious electronic construction. As it is able to copy a.m., as well as c.w. and s.s.b., it's ideal for initially receiving those powerful short wave broadcast stations not far removed from each Amateur band.

The kit includes controls for band selection, tuning, level of regeneration and a switchable r.f. attenuator. Supplied with all parts for 'flat' construction, The Calcott is priced at £24 plus £2 P&P.

The second new kit is the **Brent**, which is a 1.5W single band direct conversion c.w. transceiver. It's small (measuring just 100 x 80mm) but still has all the essential features for c.w. - full 'break-in' TR switching, RX muting, TX side-tone, narrow RX filters (r.f. and a.f.) and transmitter low-pass filters!

The 3.58MHz ceramic resonator has a 100kHz swing on the main tuning with a fine control that is also the r.i.t. For other bands upto 14MHz, it can use a crystal, or preferably the optional Mini Mixer kit, which preserves the wide and easy tuning characteristics by mixing the standard 3.5MHz v.f.o. with a suitable crystal.

The Brent is supplied with all parts for 'flat' construction and is priced at £34 plus £2 P&P. The Mini Mixer kit for other bands costs £14.

The final new kit to be added to the Walford range is the **Locking** and is a major 5W c.w. transceiver project for the 3.5, 7 and 14MHz bands, filling all of the 100 x 160mm double sided p.c.b. and like the Brent it uses a 3.58MHz ceramic resonator for full coverage of 3.5MHz; for 14MHz, this is mixed with a 10.5MHz crystal.

The 80m tuning range is divided into two sections, which are replicated on 7 and 14MHz, with the fine control also acting as r.i.t. Band selection is by a rotary switch. It has full break-in TR operation, receiver muting and transmitter side-tone.

The receiver performance is optimised by use of toroids and trimmers for the r.f. filters, an r.f. amplifier and switchable r.f. attenuator, band-pass audio filtering and further wide or narrow audio filters. The Locking kit is supplied with a blank single sided p.c.b. for your own front-panel design and costs £99 plus £2 P&P.

For more details on any of the new or existing kits in the Walford range either send a stamped addressed envelope to:

Walford Electronics
Upton Bridge Farm
Long Sutton
Langport
Somerset TA10 9NJ

Or visit the website at:
www.users.globalnet.co.uk/~walfor

Irish Amateurs

Mayo Rally

If you live or are visiting Ireland during November make a note in your diary to visit the Mayo Rally.

The third **Mayo** Rally will take place on Sunday November 21 at The **Belmont Hotel**, **Knock**. The rally will follow the proven successful format of previous Mayo shows and will feature a large Bring & Buy section, a number of demonstrations and presentations, as well as a large number of traders. (and *PW* Editor **Rob G3XFD/EI5IW** plans to be there too).This combination will all go towards making the Rally one of the best in Ireland. Doors open at 1130.

The Mayo Radio club will host a dinner on the night before the rally, and a prominent gust speaker has been lined up by the Mayo REN for the occasion. A special rate for accommodation, has been negotiated with the Belmont Hotel, for the Saturday night.

All booking enquiries should be made with the Rally Director, **Padraic Baynes EI9JA** on **0876 957 154**.

Club Information

Calling all Young Radio Amateurs

A new club is being set up for young Amateur Radio operators up to and including the age of 25 across Bedfordshire and Hertfordshire. Read on for more details.....

The **Young Amateur Radio Operators Club** (YAROC) of Bedfordshire and Hertfordshire is being set-up by **Toby White M3GGV** (Chairman) and **Oliver Staines 2E0AYB** (Vice Chairman) and is aimed at the young radio operators around the world. There will be no set venue. Using the Internet and ICQ, people who are members of the club will be able to meet every two weeks between 1830 and 2100 hours UTC.

Initially, there will be two club Nets across Bedfordshire and Hertfordshire. There will be one for 144MHz and one for the 430MHz band in each county depending on coverage. If all goes well there will also be a newsletter sent out to all British and UK members, as well as world-wide members via E-mail.

There is also a webring where members can add their personal website if they have one. This is a privilege open to members of the club and you can view the webring at

http://R.webring.com/hub?ring=yarocofbeds

To register for YAROC go to **http://yaroc.fateback.com** where you can view and print a registration form. If you haven't got access to the Internet please send a stamped addressed envelope to the following address and the Chairman will send you a form to you:

The YAROC of Beds & Herts
Toby White
25 Vicarage Close
Shillington
Hitchin
Herts SG5 3LS

Update Your Address Book!

AOR Have Moved

After nine years at Belper overlooking the River Derwent, AOR have moved to Matlock in the picturesque Derbyshire Dales.

The move to the Derbyshire Dales means that AOR UK now have a larger floor area, room for an external antenna for improved reception and display facilities for the AOR and Ten-Tec branded range and easy ground floor access with adjoining parking. The address, telephone and FAX numbers have changed, but the E-mail and Internet addresses remain the same.

AOR UK LTD/TenTec DIRECT UK
Unit 9, Dimple Road Business Centre
Dimple Road
Matlock
Derbyshire DE4 3JX
Tel: 01629 581222, Fax: 01629 580070
E-mail: info@aoruk.com
Website: www.aoruk.com

Stop Press

The Total Yaesu Experience

Just as this issue was going to press we were very fortunate at the PW offices to get a glimpse of a prototype version of the new Yaesu FT-DX9000 transceiver.....

Pictured here, the FT-DX9000, which is still under development, should be seen on UK dealers shelves from mid-2005 onwards and although the price has yet to be announced the top-end version, promises to deliver a wealth of performance.

Early specifications indicate that the FT-DX9000 features identical dual receivers, selectable roofing filters, i.f. d.s.p. with adjustable filter response contours and four antenna ports. Purchasers will have the choice of a 200 or 400W version.

Featuring h.f. and 50MHz coverage, a data port for interconnection to a PC, a large multi-function TFT display and analogue meters to name just a few of the features that help to make this a total Yaesu Experience. Look out for more details on the FT-DX9000 on **www.yaesu.co.uk** Updates will also appear on these pages.

Also pictured is the new FT-60 dual-band hand-held, which *PW* will be reviewing in the not too distant future. Watch this space!

Yaesu UK Ltd
Unit 12, Sun Valley
Business Park
Winnall Close
Winchester
Hampshire
S023 0LB
E-mail:
sales@yaesu.co.uk
Website:
www.yaesu.co.uk

amateur radio clubs

Keep up-to-date with your local club's activities and meet new friends by joining in!

COUNTY DOWN

Bangor & District Amateur Radio Society
Contact: Michael Stevenson GI4XSF
Tel: 028 4277 2383
Website: www.bdars.com

Members of the Bangor & District Amateur Radio Society meet on the 1st Wednesday of every month in The Stables, Groomsport at 2000. At 2000 on Wednesday 3 November 2004 they are holding their annual surplus sale. This excellent event is always a popular way to make some space in your shack. There will be a small admission charge, but there is no charge for tables. The sale will be held at the Crawfordsburn Country Club. The next Foundation Licence course is to be held on 27/28 November 2004.

ESSEX

Braintree & District Amateur Radio Society
Website: www.badars.org.uk

Meetings take place every 1st and 3rd Monday of the month at The Clubhouse, Braintree Hockey Club, Church Street, Bocking. Doors open from 1930 for an 2000 start to the meetings. Prior to starting and during the refreshment break, members have the opportunity to sell or exchange equipment, etc. Meetings normally finish around 2200. The club also operates a non-smoking policy at its meetings. The club produces a magazine, *BARSCOM*, which is issued free to members, usually at the first meeting of the month.

KENT

Bromley & District Amateur Radio Society
Tel: (01689) 818582
Website: www.bdars.org

Meetings are held on the third Tuesday evening of every month at 2000 at the Victory Social Club, Kechill Gardens, Hayes, Kent. Members range in age from early twenties to senior citizens. Apart from the social contact of other like-minded interested persons, the club offers a base of experience, both technical and practical, for all aspects in the hobby - from items as diverse as Amateur Television to Weather Satellite Monitoring via low power operation to Data Modes. It is also one of the few clubs in London to run the incentive licence courses and examinations, at Foundation and Intermediate levels, as required by Ofcom. The club hold regular talks and presentations on aspects of the hobby, both by members and outside specialist guests. A number of more social evenings are held, such as inter-club Quiz Nights and Radio Orienteering based 'Fox Hunts'.

LONDON

Southgate Amateur Radio Club
Website: www.southgatearc.org

Members of the Southgate Amateur Radio Club meet on the second Thursday of the month at Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane Winchmore Hill, London N21 3ER, commencing at 1930 for an 2000 start. A guest speaker is usually invited to give a talk on a subject of interest. Membership is open to all who are interested in the many facets of Amateur Radio, the numerous and varied activities not restricted to those who hold transmitting licences. Members range in age from youngsters to senior citizens and visitors and new members are always made most welcome.

LOTHIAN

Cockenzie & Port Seton Amateur Radio Club
Contact: **Bob Glasgow GM4UYZ**
Tel: **(01875) 811723**

The Cockenzie & Port Seton Amateur Radio Club, Lothian, Scotland, was formed by Bob Glasgow GM4UYZ in 1984 to help local Amateurs get to know each other. Numbers have increased steadily over the years and now average about 20. The club meets on the first Friday of every month (second Friday of January) in the lounge of the Thorntree Inn on the old Cockenzie High Street from 1900 till late. The club is run in a very informal way, there are no fees, no real committee structure, just a group of like minded people doing something they enjoy! The club supports the British Heart Foundation in memory of a members who died from heart disease by donating the profits from events that the group hold.

Keep those details coming in!

doing it by design

This month Tony Nailer G4CFY takes a detailed designer's look at the operational amplifier. As usual there's a possible project for you with the added bonus of easy-to-obtain 'kits & bits'.

The ideal amplifier would have an infinitely high input impedance, infinitely low output impedance, infinite gain and infinite bandwidth. The humble valve had very high input impedance, moderate output impedance, high gain and wide bandwidth. Then came the transistor with low input impedance, moderate output impedance, moderate gain and relatively low bandwidth.

Fortunately, the transistor was a low power consumption and very small device. So it lent itself to be used in complex combinations to achieve some of the characteristics of the ideal amplifier.

One arrangement was the Darlington connection of two transistors, which produced a very high input impedance and very high gain, (see **Fig. 1**.).

By using a Darlington stage as a voltage amplifier, with the output from the collector feeding another Darlington stage as a current amplifier with output taken from the emitter, it achieves very high input impedance. There's also very low output impedance and very high gain.

The disadvantage of the arrangement would be poor immunity to supply line noise and signals that would become superimposed on the signal being amplified. The solution is the differential amplifier that uses two emitter coupled transistors to cancel out supply line signal and noise.

The differential amplifier also provides two inputs and two possible outputs. An interesting aspect of the differential amplifier is that if the output is taken from just one collector, the output signal will be inverted when fed to one input, but non-inverted if fed to the other input. (see **Fig. 2**).

Operational Amplifiers

Operational amplifiers are made up using differential Darlington input stages and push pull emitter follower output stages. This achieves an input impedance in excess of 10MΩ, output impedance below 75Ω, and a gain greater than 80dB up to 100kHz.

However, the bandwidth is fairly restricted with unity gain occurring at somewhere between 1 and 10MHz for traditional types. Nevertheless the 'Op Amp' is a very useful circuit for audio and instrumentation purposes.

Originally op amps were configured to be used with 'plus' and 'minus' supply rails of equal voltage such that the input and output terminals would be within a few millivolts of zero volts. In practice it's quite simple to operate the device from a single rail by using two equal value resistors to provide a mid-rail bias applied to the positive input (see **Fig. 3**.).

Inverting Amplifier

The gain of an Op Amp is set by an input resistor and a feed back resistor. The resistors Rf and Rin form a potential divider where the voltage at the input terminal always stays relatively fixed. In **Fig. 4**, assume a supply rail is 10V, + input will be 5V, Rf is 10kΩ and Rin is 1kΩ.

Now, if a voltage of 5.2V d.c. is applied to the input terminal, the output voltage will fall until the - input of the op amp is back at 5V. This occurs when the output is at 3V. From in to out there's a voltage differential of 5.2 - 3 = 2.2V. There's 0.2V across the 1kΩ Rin and 2V across the 10kΩ Rf.

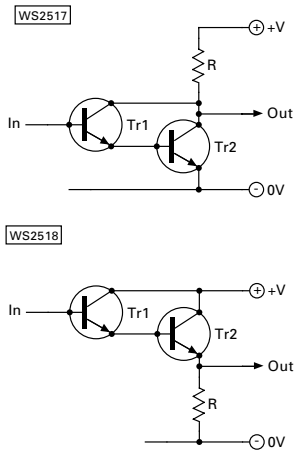


Fig. 1: The Darlington connection of two transistors that produced a very high input impedance and very high gain (see text).

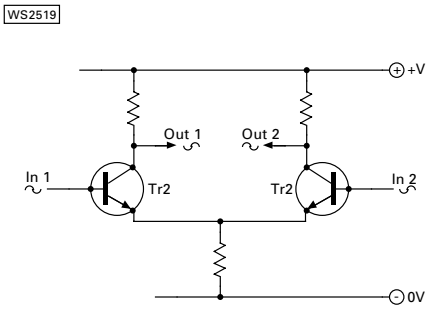


Fig. 2: An interesting aspect of the differential amplifier is that if the output is taken from just one collector, the output signal will be inverted when fed to one input, but non-inverted if fed to the other input (see text).

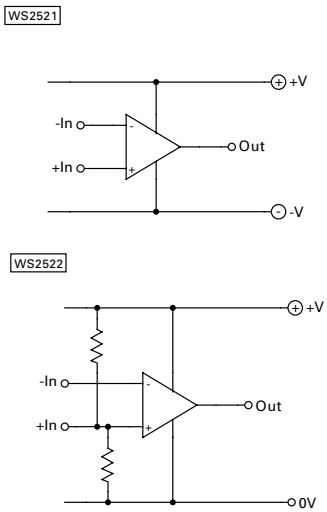


Fig. 3: Originally Op Amps were configured to be used with 'plus' and 'minus' supply rails of equal voltage such that the input and output terminals would be within a few millivolts of zero volts. In practice it's quite simple to operate the device from a single rail by using two equal value resistors to provide a mid rail bias applied to the positive input.

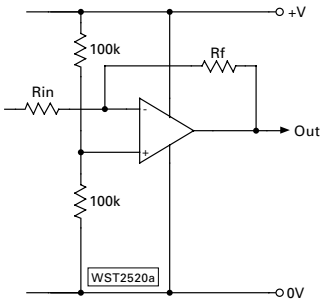


Fig. 4: The gain of an Op Amp is set by an input resistor and a feed back resistor. The resistors Rf and Rin form a potential divider where the voltage at the input terminal always stays relatively fixed. (See text for more detail).

For a 0.2V positive applied to the input resistor there is a 2V negative movement at the output. This corresponds to the ratio of the feedback resistor Rf to the input resistor Rin. The gain of an inverting stage is hence A = - (Rf / Rin). In this case -10.

The Op Amp output will always move in such a way as to keep the negative input voltage close to that of the positive input. The actual voltage at the junction of Rin and Rf remains virtually constant and so earns the name of a virtual earth.

Inverting AC Amplifier

In a practical inverting audio amplifier an electrolytic capacitor would be used at input and output to provide d.c. isolation. Both in and out ports of the circuit are at half supply rail, so the positive connection ends of the capacitors connect to in and out.

The value of the d.c. isolating capacitor should be such as to have about 1/10 the reactance of the resistor Rin at the lowest operating frequency. If this amplifier was to be used for speech then Xc should be about 100Ω at 300Hz.

C = 1 / (2πfXc) = 1 / (2π300x100) = 5.3µF.

Use 4.7µF.

Non-inverting AC Amplifier

The non-inverting amplifier, **Fig. 5**, works in a similar fashion but as Rf and Rin are now in effect a potential divider from output to ground. Without the addition or subtraction of the input voltage, the feedback voltage is now proportional to Rin / (Rin + Rf). The gain A is then equal to Vo / Vin = (Rf + Rin) / Rin, so A = 1 + (Rf / Rin).

Note that Rin is connected to 0V via a low reactance electrolytic. The potential divider resistors feeding the positive input set the inputs and outputs at half rail volts. So the electrolytic will quickly charge at switch-on with current flowing from the output via Rf and Rin to have half rail volts across it.

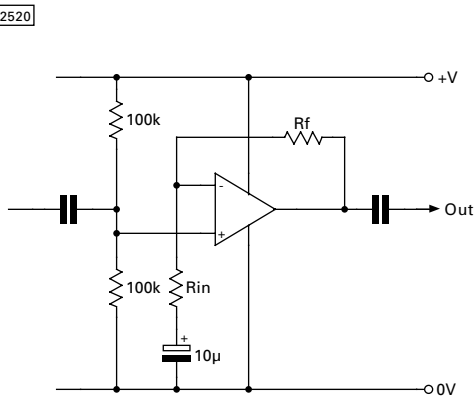


Fig. 5: Changing the layout a little gives a non-inverting amplifier that is a.c. coupled both in and out.

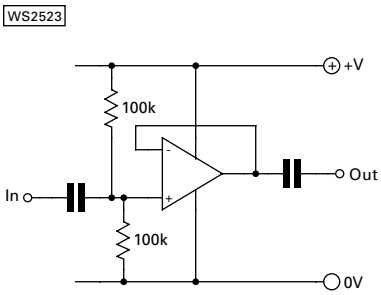


Fig. 6: If the resistors Rin and Rf are removed and the negative input is directly connected to the output, all the output voltage is fed back a voltage follower stage is created. This is non-inverting with a very high input impedance and a very low output impedance. It acts like an emitter follower (see text for more detail).

The positive input may need to be d.c. isolated from the previous stage. It has such high resistance that the parallel value of the potential divider resistors define the input value. A coupling capacitor here only needs to be 1/10 of 50kΩ, which is 5kΩ. Putting this into the same equation used previously gives a value of 0.1µF, or 100nF.

Voltage Follower

If the resistors Rin and Rf are removed and the negative input is directly connected to the output, all the output voltage is fed back a voltage follower stage is created. This is non-inverting with a very high input impedance and a very low output impedance. It acts like an emitter follower (See **Fig. 6**). The input capacitor is the same as for a normal non-inverting amplifier. The capacitor at the output would have a value related to the input resistance of the following stage.

Another use of the voltage follower is to create an artificial mid rail. In this case the input capacitor is used to decouple any noise passing down the potential divider resistors. The output is now a half rail point with a source resistance of about 75Ω, (see **Fig. 7**).

Often when using a quad op amp package, one of the amplifiers will be used as an artificial mid-rail source to bias the other amplifiers. When used as a mid rail source it may need to have an additional electrolytic added at the output if large a.c. signals are in use by the other amplifiers.

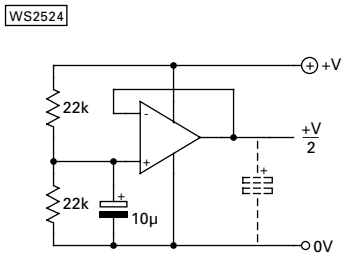


Fig. 7: Another use of the voltage follower is to create an artificial mid rail. In this case the input capacitor is used to decouple any noise passing down the potential divider resistors. The output is now a half rail point with a source resistance of about 75Ω (see text).

Audio Mixer

Two or more input resistors can be added to an inverting amplifier to create an audio mixer. It's important though that these mixer inputs are fed from low impedance sources such as the outputs of other op amps.

When a signal is fed to one of the inputs, all the input resistors form a potential divider so that the signal at the negative input of the op amp is reduced by that ratio. If the mixer is a two port design the signal then becomes halved. For a three port it's divided by three. In this case if three identical signals enter the three ports the output would be the same amplitude as one of them, provided the nominal gain was unity.

In most op amp circuits, the absolute value of resistors is not usually as important as the ratios. The circuit and calculations are shown in **Fig. 8**.

Interstage Coupling

The output of an op amp is never precisely the same d.c. level as at the input, there is always some offset as a characteristic of the i.c. type and is referenced to the input. In the case of the humble LM324 the input offset is 2mV. In stages, as shown in Fig. 5, with the negative input

connected to ground via the electrolytic capacitor, the d.c. gain is unity so there isn't a problem. With stages which are directly coupled it is amplified by the d.c. gain of the stage and appears at the output greatly increased.

For an amplifier with a gain of 30, a 2mV input offset becomes 60mV at the output. This is still not a problem but if another stage with a gain of 30 was directly coupled to it, the cumulative offset would now be 1.8V at the output of the second stage.

When using capacitors to couple the a.c. signal whilst blocking the d.c. levels it isn't practical to use electrolytics unless the d.c. differential between the two stages is greater than the peak swing of the a.c. signal. What this means is that if two cascaded op amps are tied to a mid rail by their positive inputs, the output of the first will only be a few millivolts different from the input of the second. If the a.c. signal passing between the stages is say 1V, then for half of each cycle the electrolytic capacitor will be reverse biased.

In this case, if it's really necessary to use electrolytics to achieve low reactance, then one stage should be biased say at mid rail plus 1V and the other at mid rail minus 1V. Then with an a.c. signal of 1V peak, there will always be at least 1V forward bias on the electrolytic. (see **Fig. 9**).

Basic Power Supply Regulator

The differential feature of the op amp is well used in power supply design by fixing one input to a voltage reference such as a Zener diode and then feeding the other input from a potential divider across the output (see **Fig. 10**). This can be used from 8 to 12V and supply up to 150mA.

If the load draws a bit more current and makes the output voltage drop, then the voltage at positive input of the op amp will drop. The output of the device will also swing down and pass more current through the pass transistor Tr1 and the 220Ω resistor. This will in turn pull the collector of the pass transistor closer to its emitter bringing the output voltage back to its nominal level.

The output voltage is across the potential divider R2 + R3. The voltage across R3 will be the same as across the Zener. So 5.1 / Vout = R3 / (R2 + R3). From this by transposition of formula I have derived two formulas to aid in the design of the circuit:

a) R2 = (Vout - 5.1) x (R3 / 5.1). Choose R3 and Vout, then solve the bracket first.

b) Vout = (R2 + R3) x (5.1 / R3). Put in values of R2 and R3, then solve the bracket first.

I will solve the equations for an 8V output supply. I choose R3 to 8.2kΩ.

R2 = (8 - 5.1) x (8.2kΩ / 5.1)

R2 = (2.9 x 8.2kΩ / 5.1) = 4.66kΩ.

If you really need precisely 8V out then make up R2 with 3.9kΩ in series with a 1kΩ ohm trimpot. This will also correct any error in the actual voltage of the Zener.

Otherwise choose the nearest value to 4.66kΩ which is 4.7kΩ, calculate the output voltage and decide if it is close enough.

Vout = (4.7kΩ + 8.2kΩ) x (5.1 / 8.2kΩ)

Vout = (12.9kΩ x 5.1) / 8.2kΩ = 8.02V. This may be close enough.

The capacitor C1 47nF across the Zener reduces input supply rail ripple and noise. The capacitor C2 100µF across the output to act as a reservoir to surges of load current.

For output up to 50mA use a BC557 for the pass transistor and for currents up to 2A a TIP115 or similar PNP Darlington can be used, provided it is mounted on a suitable heatsink. A 741 Op Amp is shown but almost any type can be used including one of a quad package.

PW

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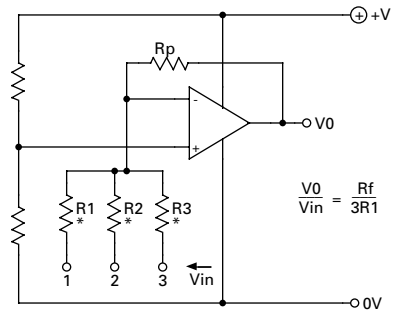

Fig. 8: In most op amp circuits, the absolute value of resistors is not usually as important as their ratios. The circuit and calculations are shown here (see text).

WS2527

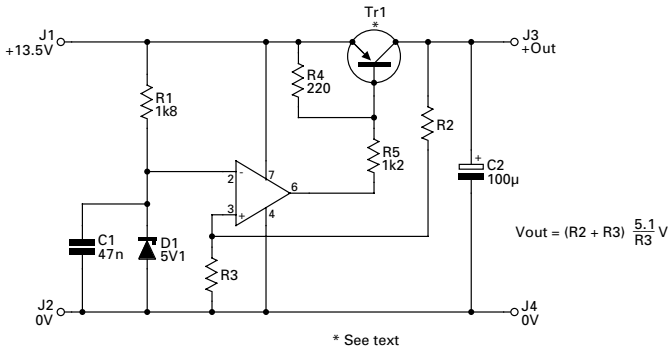

Fig. 10: The differential feature of the Op Amp is well used in power supply design by fixing one input to a voltage reference such as a zener diode and then feeding the other input from a potential divider across the output (see text).

WS2526

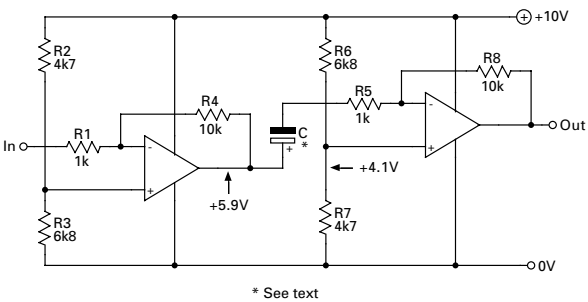

Fig. 9: If really necessary to use electrolytics to achieve low reactance, then one stage should be biased say at mid rail plus 1V, and the other at mid rail minus 1V. Then with an a.c. signal of 1V peak, there will always be at least 1V forward bias on the electrolytic (see text).

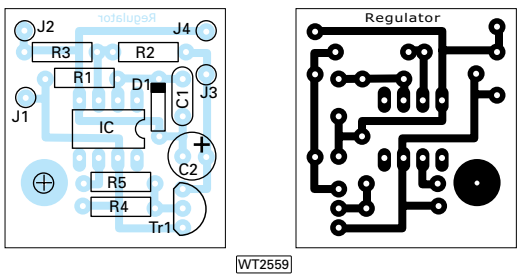

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Fig. 11: A suitable p.c.b. for the regulator circuit of Fig.10. See the Kits & Bits panel above for supply details.

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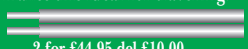

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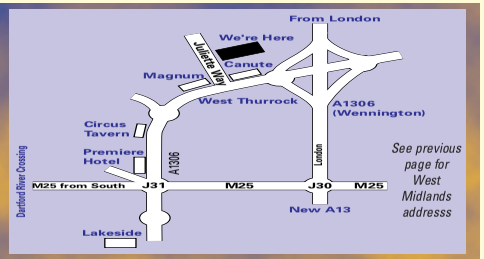

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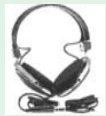

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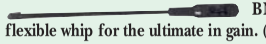

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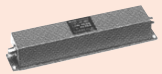

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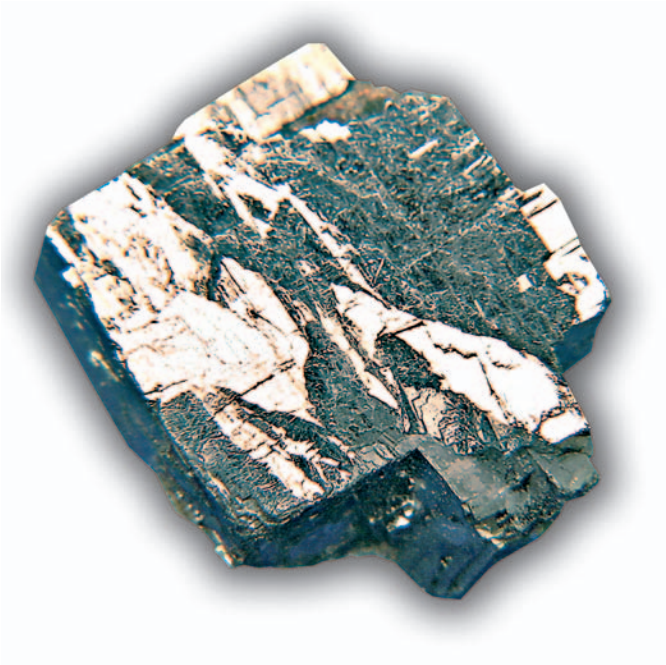
radio basics

This month Rob Mannion G3XFD, in Part 1 of a short series on the subject, is taking a look at the detectors used in Radio Basics projects. First on the menu is the Galena and 'Cat's whisker' detector from Great-grandad's day!



● A sample of Galena crystal (Lead Sulphide - the commonest form of Lead ore) is a beautiful material and can form a useful - and fascinating to use- radio frequency detector. But be prepared...you'll need patience and skill 'tickling the whisker'!

I have no doubt that many readers will have been fascinated to read the news story entitled 'Get Your Galena & Support GB4FUN', page 19 in the October issue of *PW*. In the news item North Yorkshire based *PW* reader **Jim Roberts** - who I'm proud to call a good friend - announced that a supply of Galena (Lead Sulphide, the commonest form of lead ore and kindly donated by a local quarry) was available from him in return for two £1 coins, stamped addressed envelopes and film cassette container to protect the Galena crystals in transit.

Not only was Jim prepared to provide the Galena to readers, he was planning to support the **Radio Society of Great Britain's** touring Amateur Radio Educational Vehicle **GB4FUN**. Incidentally, as I write this edition of Radio Basics (RB) Jim tells me that enough money has been raised by the initiative - to pass on a donation for use on GB4FUN.

In the news story I mentioned that Jim had provided me with Galena sample and it proved very successful. However, a few readers seemed to have experienced problems using the Galena and 'cat's whisker' detector so it seems a good idea to briefly look at this simple detector at the beginning of this short series. But before doing so, I must warn you - like a steam locomotive - the Galena detector does require care and skill to 'drive' to obtain the best results!

Whisker & Oxide

The first 'secret' (if there is one) when using a Galena detector is that it's essential to use a steel wire as the cat's whisker. The whisker is the flexible spring with a sharp point at the end used to touch the crystal.

In practice I've found the whisker can easily be fabricated from a small steel spring - of the type often recovered from old cassette recorders, record decks, etc. You can even buy selections of springs from hardware dealers now - but avoid anything, which looks as if it's been plated with chrome or other metals.

To modify the spring, first heat it in a flame (take care to do this while holding the spring with pliers) and when it's red hot slowly draw the spring out slightly and bend the wire (the section to become the point contact) to make it bend at almost a right angle from the main spring. When it's cool, you can file, grind or cut the wire (this will be made easier because of the annealing process which has taken place by letting it cool naturally) at an angle to provide a point.

The diagram **Fig. 1** (for reference this originally appeared in the January 1998 RB) illustrates how you can mount the Galena detector. In the diagram shown, a copper oxide washer is used as a point contact metal oxide rectifier. All you have to do is to replace the washer with the Galena. Depending on the size of the Galena crystal sample, it may be easier to hold this in place with a single crocodile clip.

Using the 'croc' clip method you must ensure that the clip clamps the Galena very securely and that the crystal (where the clip grips it) is clean. This is because as soon as it's exposed to air the surface rapidly oxidises. Incidentally, this is why it's necessary to 'tickle the whisker' (as Grandad called it) to find a new sensitive spot regularly.

However, all we require the clip to do is to hold it firmly. The steel 'whisker' is what we'll use to provide the signal detector. With this in mind, ensure that when you set the Galena – the surface under each jaw is clean and bright!

The circuit in Fig. 1 is probably one of the simplest you can have for use with a Galena detector. But it works - and it can work extremely well...as my own experience has proved.

At this point I should remind those readers who have built simple receivers like this - especially to beginners - that you cannot expect a simple detector receiver such as this to provide 'single signal' reception. Indeed, you're likely to have several stations to choose from - the skill needed to minimise the problem 'Crystal' sets aren't very selective but normally, this method although it can increase signal level significantly, can also worsen the lack of selectivity (the ability to allow you to hear only the station you require).

The circuit in **Fig. 2** is worthwhile trying because you can take full advantage of the enormous gain (amplification) by the integrated circuit (i.c.) amplifiers I've described in the past.

Amplifier Detector

The circuit in **Fig. 3**, utilises an efficient little radio frequency (r.f.) amplifier feeding direct into an untuned diode detector. I recommended recorders try this circuit first by using a standard wire-ended diode. Once you have proved the

circuit is working - I suggest you feed the r.f. output straight to the Galena detector - don't be surprised at how sensitive the combination is. You'll have built your first tuned radio frequency (t.r.f.) receiver.

Once you have tried the circuit in this it's most basic form - you should then tune the untuned detector into a tuned detector. This is easily achieved by literally building another crystal detector with a capacity fed link from the r.f. amplifier as in Fig. 3. It's worthwhile feeding the circuit by inductively coupling the amplified r.f. signals into the detector. Using this method is simplicity itself electrically, but perhaps a little fiddly for the novice constructor as it requires a coupling inductor, wound over the main tuning inductor.

In practice - it's not so difficult though! I say this to encourage readers because I know (from your letters) how daunting some of you find the coil winding business to be! For a medium wave coupling coil, wind around 20 turns over the centre section of the main tuning inductor (coil) ensuring it's wound in the same direction as the main winding. The lower end (the earthy end) goes to the negative (ground) chassis line. The top end has the coupling capacitor lead connected directly to it. Try it out for yourself - you should certainly notice that the receiver is able to 'select' (separate) the stations received much more effectively than beforehand.

Popular Circuit

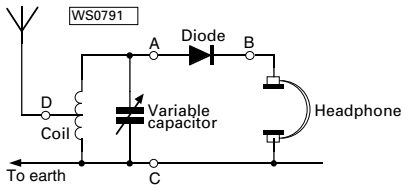
Incidentally, I think it's worth mentioning that the h.f. (as it was called in the early days of radio) or r.f. amplifier working straight into a detector was a popular circuit in the heady days when *PW* was founded and Edited by the late **F. J. Camm**. Indeed, it was a circuit I built in the 1950s - straight from the *Practical Wireless Circuits Book* which demonstrated to me how fascinating radio is! My circuit used a 2V filament (directly heated), 215SG valve (the SG refers to the screen grid used in the valve, permitting it to become an efficient and stable amplifier. Nowadays the MPF102 field effect transistor (f.e.t.) will take its place.

Although I'm not going to delve into the technique too deeply here, it's worthwhile mentioning (it's a technique which seems to have been forgotten nowadays) the regenerative r.f. amplifier. I built many receivers using this technique and in my opinion it's well worth trying (more later).

Referring back to Fig. 3, a quick glance at the r.f. decoupling capacitor (the 10nF capacitor decoupling r.f. from the junction of the 100Ω resistor and the radio frequency choke (r.f.c.) can be used to redirect the amplified signal back through the MPF102, via the input (the Gate). All that needs to be done is to move the capacitor's connection from the junction of the r.f.c and 100Ω, and connect it directly to the other end of the r.f.c. (the f.e.t.'s Drain). Normally, the capacitor would be a variable type so that the amount of feedback applied (which can provide a significant amount of gain) can be varied.

For those of you who are interested in the circuit of the **late Sir Douglas Hall** - it's worth noting that this design was renowned for using this form of 'regeneration' along with full 'reflexing' (using a stage/or stages to provide both r.f. and a.f. amplification.

Next time I'll be looking into regenerative detectors and other useful type. In the meantime, I hope you get the soldering iron out, plugged in



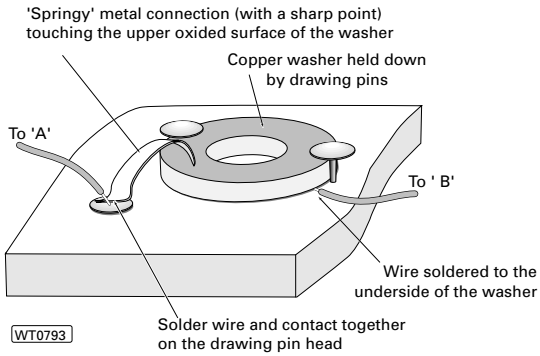


Fig. 1: Diagrams illustrating one of the simplest ('home-brewed') detectors possible (right). And the associated extremely basic 'crystal' receiver. Please note that this circuit will work with semiconductor wire-ended diodes, Galena crystals (see text) and various forms of metal oxide rectifiers (see text). For medium wave coverage 100 turns of 24s.w.g. (or any other thin enamelled wire) wound onto a former (a 35mm film canister is suitable), tapped at 50 turns for the antenna input) and a variable tuning capacitor of between 150 to 250pF will be suitable. Note: Other values will work but the tuning range will be different. Rob G3XFD recommends you use a dip meter to prepare the inductor. A good antenna and earth is required for efficient reception. Rob also thoroughly recommends readers trying this circuit out on short waves where reception can be surprisingly good because field strength levels from incoming broadcast stations can be very high. If you have a dip meter (highly recommended) you should wind the inductor to cover the 6 to 8MHz region with the variable capacitor of your choice.

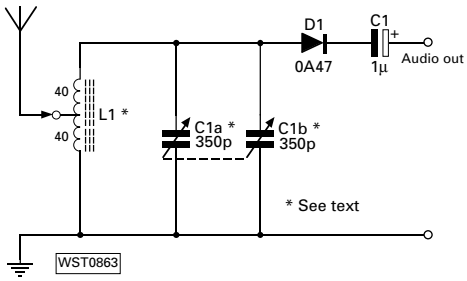


Fig. 2: An alternative circuit, ready to connect into an audio amplifier. This circuit, it will work satisfactorily with literally any good quality low forward resistance diode, can be used with any of the high gain audio amplifier project previous published in the Radio Basics series. Inductor details shown should provide coverage of the medium wave band – but this will vary depending on the inductor former diameter, wire size, etc. Rob G3XFD encourages you to experiment. This circuit works exceptionally well on the short wave bands and will be capable (with the use of an a.f. amplifier) of receiving many stations some previously unheard before due to the fact that they were too faint to be heard in headphone. To start you experimental inductor winding G3XFD suggests you wind an inductor using a 35mm film canister, starting with 20 turns of any thin wire (you can use pvc covered interconnecting wire) forming a tapping point at 10 turns.

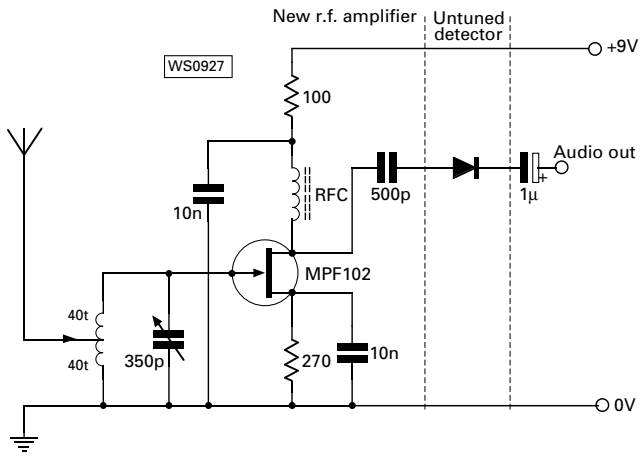
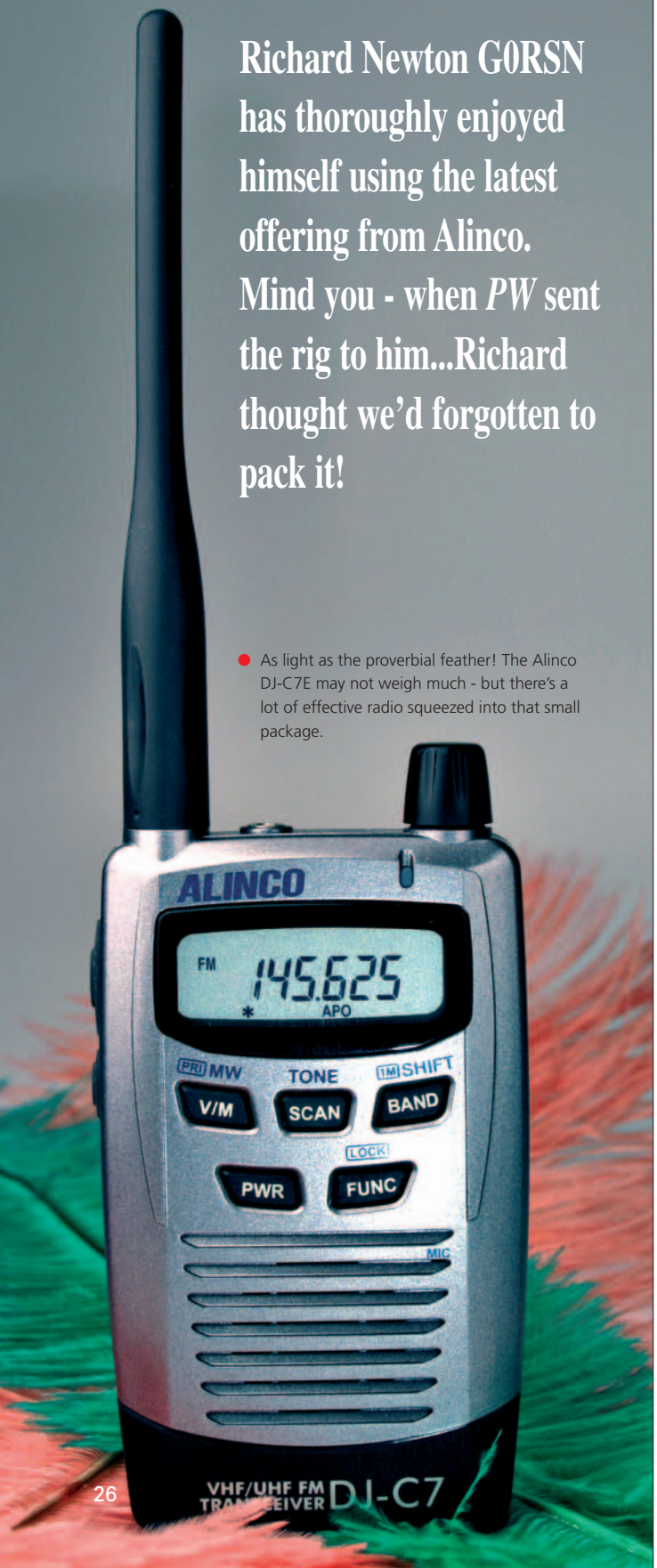


Fig. 3: Circuit showing a simple tuned radio frequency (t.r.f.) amplifier stage feeding into an un-tuned detector. It's suitable for direct connection into any of the a.f. integrated circuit amplifiers used in previous RB projects. Rob G3XFD encourages readers to try this simple approach whose origins can be traced back to the earliest days of radio.

A Cracking Little Rig!

The Alinco DJ-C7E VHF/UHF FM transceiver

Richard Newton G0RSN has thoroughly enjoyed himself using the latest offering from Alinco. Mind you - when *PW* sent the rig to him...Richard thought we'd forgotten to pack it!



As light as the proverbial feather! The Alinco DJ-C7E may not weigh much - but there's a lot of effective radio squeezed into that small package.

The Alinco DJ-C7E is a small, low power hand-held operating on the 144 and 430MHz Amateur Radio bands with extended receive capabilities. It differs from a lot of the other similar rigs on the market in one main aspect; its size and weight.

When I first got the box from the *Practical Wireless* offices I thought they had forgotten to put the rig in it! But on opening it I found The Alinco DJ-C7E, **Fig. 1**. The next thing I tried to find was the battery pack, but after a short while I realised that it was already attached!

The Alinco DJ-C7 was lighter and thinner than my mobile 'phone and I proved this by using our trusted Salter scales in the kitchen! I have to be honest and did wonder....was it all a bit of a late April fool spoof, and would it actually work?

The rig is supplied with a helical antenna, wall charger, Lithium-ion 3.7V 600mAH battery pack and a cap for the SMA antenna connection (on the top of the rig), **Fig. 2**. The cap is supplied because you can use the rig's set-up menu to select the earphone socket as the antenna instead of the SMA socket. This is for use with optional extra earphone antenna to receive Band II v.h.f. broadcast radio.

A Lightweight!

The Alinco DJ-C7E measures approximately 58mm wide by 96 mm high and 14.5mm deep and is a true lightweight... weighing in at about 102gm!

The rig looks great in my opinion, it's professionally finished in black and sliver plastic with the minimum of controls. It has five main buttons on the front and these controls are well labelled. The press-to-talk and a **Function** button can be found on the side of the rig, and a multi function rotary control on the top of the rig.

Depressing the rotary control accesses its different functions. The simplistic labelling and good design made this little rig easy to use. On the rare occasions I did get a little lost, a glance at the well laid out handbook was all that I needed.

The liquid crystal display (l.c.d.) on the rig was a good size, with the chosen frequency being displayed using reasonably sized numbers. I was a little disappointed that there did not seem to be a back light for this display, perhaps this was part of the trade off for the rig's size and weight?

The Alinco DJ-C7E covers the 144 and 430MHz Amateur bands on transmit and receive. It produces 300mW output power on the supplied battery pack and 500 mW on 6V d.c. external power.

Wide Coverage

The Alinco DJ-C7E also offers wide band f.m. (w.f.m.) receive coverage on the Band II broadcast band. It will operate on one band at a time; the bands are toggled in ascending order by a single button press.

The DJ-C7 is also able to extend its receive range even further to include the a.m. air band coverage with 8.33kHz steps. **Note**: Although this is not included in the Specifications for the E model, the review radio had this feature activated and I found the air band receive

performance was excellent.

Band II v.h.f. reception: I don't know how successful readers have found rigs that purport to receive Band II broadcast band transmissions. But from my own experience, I've almost invariably found that although they do a reasonable job...I normally have to use a different antenna as the reception on the supplied antenna is not often very good.

However, with the Alinco DJ-C7E on and tuned to 88.5MHz, I have to be honest and report I was flabbergasted by the incredible audio quality and strength of BBC Radio 2 service, the 'Tog-meister' *(**See note below**) himself was booming out of this little rig as large as life...just using the supplied helical antenna.

***Note:** For those readers (like myself) who prefer Radio 3, 4 and 7, and who aspire to be as unworldly as Crown Court/High Court Judges - this term refers to one Terry Wogan, a gentleman hailing from Limerick I believe! **Editor**.*

Considering this rig's compact size and the fact it was operating inside a bungalow on a helical whip I was absolutely 100% impressed. The audio quality was very good indeed.

My eldest son, **Thomas M3TJN** (11 years) was next to me, he said, "Why is it doing that Dad?" I think he was a little shocked that a hand-held would be blasting out Terry Wogan, I explained that the rig also received f.m. radio, Tom's response was simply, "Cool"! need I say more!

Most Functions

The Alinco DJ-C7E offers most of the functions I would both expect and hope for from a modern hand-held. It offers 200 memories, five pairs of programmable scan limit memories and a priority channel for priority monitoring.

An auto repeater function and full CTCSS capability are provided. The transceiver also has a set-up menu to allow the operator to personalise squelch and volume settings, beeps and alerts and much more

During the period when I had the rig for review I was doing voluntary duty for **St. John Ambulance** at the **Great Dorset Steam Fair.** Some of the other volunteers up there were also licensed and so the Alinco DJ-C7E got its first test up at the steam fair near the town of Blandford Forum.

The Steam Fair covers over 600 acres and the temporary population represents a small to medium sized town. There are approximately 35,000 to 40,000 people resident on-site for the week and this population grows considerably each day with day visitors!

My friends **Sam Machin G0SVM**, **Mike Buck M3BUK** and I kept in touch when we were out and about using Amateur Radio as a back up to the St John's p.m.r. channels. We also used it just to keep in touch regarding the whereabouts of the best hog roast and freshly cooked

Fig. 1: The Alinco DJ-C7E with associated antenna, posed alongside a UK 20p piece. The small coin indicates just how small the transceiver is!

Fig. 2: Top of the transceiver, showing the SMA antenna socket, earphone/microphone socket and main controls (see text).

PRODUCT

Alinco DJ-C7E v.h.f./u.h.f. f.m. transceiver

COMPANY

Nevada (Alinco UK Agents)

CONTACT

Nevada, Tel: 023-9231 3090, FAX: 023-9231 3091, E-mail: sales@nevada.co.uk

PROS AND CONS

Pros: I think that the Alinco DJ-C7E is a cracking little rig that you almost forget you are carrying. The received audio quality is truly excellent in my opinion. The ideal rig to take away on holiday or to a rally.

Cons:....its relative low output power obviously means the rig has limitations.

PRICE

£149

SUMMARY

The ideal rig to take away on holiday or to a rally.

SUPPLIER

Nevada, Unit 1, Fitzherbert Spur, Farlington, Portsmouth, Hampshire PO6 1TT.

Cornish pasty! I'm sure that comes under self training and technical experimentation doesn't it?

Sam and Mike both commented on how clear the transmitted audio was from the DJ-C7, although I have to say that its 300mW did on occasion struggle with the terrain. But all-in-all I was very impressed.

The great thing about the rig was that it just slipped into a top uniform pocket and you would hardly know it was there. Very useful for listening to '**Steam FM'**, the local temporary Band II v.h.f. broadcast station set-up for the Steam Fair on 87.MHz.

The Alinco DJ-C7E also helped keep me company in the wee small hours by giving a perfect received signal of BBC Radio 2 in the caravan in the middle of a field. Using the auto power-off feature I could drift off to sleep listening to late night radio and have no fear of a flat battery. Having said that, the battery re-charges in just over two hours anyway.

I found that from a vantage point on top of the hill overlooking the site I could speak to Mike and Sam on site and even access the Bournemouth repeater, **GB3SC** on 145.625MHz some 25km away. Alas I got no takers to the plaintiff calls I made via the repeater.

On my return home I thought that I should try and get some more contacts. The problem is that with such a small output power I was hearing lots of stations, but wasn't able to speak to anyone.

I was impressed with the receiver sensitivity of the Alinco DJ-C7E, as I was able to hear the repeater in Bournemouth from my QTH in Ferndown on the helical whip. And considering my home is some 16km from Bournemouth this isn't bad at all.

Next, I connected the rig onto my WX2 co-linear antenna; this is about 7m above ground level. Incidentally, my QTH is only about 6m a.s.l. Again the Alinco DJ-C7E's performance impressed me.

The rig wasn't at all over burdened by being connected to the main station antenna. I could hear two stations on the Isle of Wight (approximately 40-50km away), they were both an excellent signal with me but 300mW was just not enough to get to them I guess. My numerous "break please" transmissions were in vain.

Next I tried 145.500MHz but call after call went unanswered, then I heard a massive signal, it was my son Thomas from his station inside the bungalow. Obviously feeling sorry for me he had come-up to give me a contact with a "you are 5 and 9 Dad, no fuzz at all!"….report.

I then tried the Bournemouth repeater GB3SC again on 145.625MHz. This time I got a contact with **Peter G7PRO/M**. I quickly established that as luck would have it Peter was only a few kilometres away. Peter kindly agreed to go simplex to give a more precise report for me and told me that he was using a Kenwood TH-22E with a speaker microphone running 2W into a 5λ/8 wave mobile whip on a mag-mount.

Peter said, "The audio is okay Richard, perfectly readable, clear, clean signal". He then stopped, about 2km away from my QTH and I put the helical antenna back on the Alinco DJ-C7E, followed by a successful simplex contact using just the helical whip.

Cracking Little Rig!

I think that the Alinco DJ-C7E is a cracking little rig that you almost forget you are carrying. The received audio quality is truly excellent in my opinion although its relative low output power obviously means the rig has limitations. Despite this, the DJ-C7E is the ideal rig to take away on holiday or to a rally to keep track of family and friends and have some 'easy listening' as well!

Finally, I think the transceiver would benefit from a ear piece microphone similar to that available for mobile 'phones and the Yaesu VX1. I suggest this because putting a full size speaker -microphone on this rig would be a bit like having a laptop and wheeling a generator behind you!

Finally, my thanks go to Nevada for the loan of the review rig.

PW

The Alinco DJ-C7E In A Nut Shell

- **Full 144 and 430MHz transceiver coverage**
- **Band II v.h.f. f.m. broadcast receive**
- **Switchable a.m./f.m. receive**
- **200 memories**
- **VFO/Memory and Scan operation**
- **Full CTCSS capability (includes CTCSS scan)**
- **1750Hz tone burst (also three other tone burst freqs. selectable)**
- **Offset and Split frequency operation**
- **Programmable automatic repeater offset**
- **Cloning feature (optional cable required)**
- **Air band receive (not as standard on E model)**
- **Wideband v.h.f./u.h.f. frequency coverage (not standard on E model)**

Fig. 3: On duty with the St. John's Ambulance Brigade at the Great Dorset Steam Fair (see text).

The Vectis Run Part 11

By Rupert Templeman

It's January 1939 and travelling Wireless Technician-Salesman Alan Edwards normally regards his monthly visit to the Isle of Wight, 'The Vectis Run', as enjoyable work. Now it's looking like his final trip and there's only one person who can help…but he's about to watch television!

Arthur Cotton was starting to doze under his headphones; the constant hiss from the beacon-monitoring receiver was beginning to make him very drowsy. He'd had a good lunch and as usual Freda his wife was preparing a substantial evening meal. Arthur wondered if he could stay awake long enough to listen for the long overdue beacon signal from Alan's emergency transmitter. He'd been listening all day, leaving the running of the shop to Freda.

Freda meanwhile had been busy, and had just shut the shop up for the night, seeing Brian, their young apprentice wireless mechanic off on his bike. She watched his rear light disappear into the darkness before she climbed the stairs to their flat.

As Freda entered, Arthur seemed startled - but immediately she realised he'd been caught off guard. In fact, Arthur had just been switching on his televisor to monitor - as he did every evening - the evening programmes. As he turned to speak to Freda, the interval film being broadcast was the potter busy on his wheel - a favourite of theirs. It was so relaxing it would often send them both to sleep after a day in the shop!

Looking up at Freda, Arthur voiced his fears…"I don't think we're going to hear anything from Alan". With a sigh of resignation he turned away from his wife, replaced his headphones and resumed listening.

Freda headed back downstairs to cash up, before returning upstairs to the cooker where the evening meal was already under way. The aroma of stewing mutton and vegetables was already reaching Arthur's nostrils - making him feel really hungry.

With the headphones clamped over his ears, concentrating on the beacon receiver's hiss - Arthur was watching the Alexandra Palace transmissions picture, with the sound turned right down. He was getting a good signal, and his attention wandered to and from the nine-inch screen's dim picture, and the all-pervading hiss in the headphones. In fact, he was quite grateful for the picture to watch as he listened as it kept him awake!

Morse Code

A few miles way, just up the coast, in his cramped prison, Alan Edwards was finally adjusting the German Agent's monitoring receiver by tuning as closely as possible to the faintly buzzing vision signals from Alexandra Palace. Alan knew that the only chance he had of getting Arthur's attention was by causing interference on the bench televisor which, if Arthur did as Alan thought he'd do, would be switched on with the sound turned off. He was confident that Arthur would listen on the beacon receiver while watching his televisor.

The fact that Newtown was directly in line between Arthur Cotton's home and the Alexandra Palace transmitter in far away London helped. It could only increase the chances of the flea-power transmission - being radiated from the super-regenerative detector via the aerial somewhere in the roof - effectively appearing on Arthur's screen.

But what was the best message to send using the crude Morse key formed by using kitchen knives? Within moments he decided the first part of the Morse signal would have to be his own name, followed by the location. So, '**ALAN- NEWTOWN**' it would have to be, perhaps repeated many times…with no real way of knowing it was being heard or seen in this case! On the other hand – he knew that his friend would be thinking of him. Slowly, Alan began tapping.

Marjit looked down at this rather odd Englishman as he started to press the knife tips together. From her viewpoint above she could see faint blue sparks as Alan operated the simple key. She'd seen her own father sending Morse and knew Alan was sending a message. And despite her fear - a brief smile flickered across her face as she realised that Alan was obviously a very special young man and hopefully it would be possible to get to know him better.

Subdued Light

In Freshwater, Arthur Cotton was making adjustments to the contrast of his televisor. The picture - although it wasn't bright, was adequate and soon he'd be taking delivery of a new aluminised cathode ray tube able to provide a brighter picture.

The early evening programme was due to start and the screen was at that moment showing the well known potter's wheel interval film.

Arthur concentrated on the screen. There it was again…a flickering radio frequency patterning on the picture. It was another transmitter on the same frequency and seemed to be a Morse signal!

In a few moments the wheel would fade out, to be replaced by the announcer, informing everyone of the coming evening's programmes.

Suddenly he spotted something unusual...just as the telephone bell on the workshop wall rang shrilly. He jumped - grabbed the candlestick telephone and placed the receiver to his ear.

Arthur's angry snort into the mouthpiece unit, which he'd also grabbed from the desk, temporarily silenced the caller. It was a few moments before the person at the other end regained enough confidence to speak again. When he did, Arthur recognised the voice of a very worried Mike Cooley, ringing from his home in Ventnor.

"I'm sorry Mike"! – said Arthur, regaining his composure - "I thought it was that Secret Service man again, he's been on to me several times and I was annoyed".

Mike's voice – showing his own extreme concern – assured Arthur that he wasn't offended. He only wanted to know what – if anything - had been heard in the Freshwater area.

At that moment Arthur's eyes were fixed on the televisor screen and Mike's faint..."Hello – hello"... went unanswered.

Despite the distraction Arthur managed to concentrate on the screen. There it was again…a flickering patterning superimposed on the BBC's picture. It was the same type of interference effect which he'd seen when he used his own Amateur station. It was another transmitter on the same frequency and it appeared to be a Morse signal – just like reading a signal from an Aldis lamp!

In Ventnor Mike reacted quickly as Arthur demanded that he come to Freshwater as quickly as he could, and also to alert the Secret Service. Arthur was convinced there was a visible Morse message – albeit very faint, appearing on his screen, repeating the words 'Newtown' and 'Alan'. Before he replaced the receiver, Arthur arranged for Mike to ring him from a call box in Chale, which was approximately half way to Freshwater from Mike's home.

Before he left, Mike called the confidential number left by Mr. Smith for that very purpose. He quickly up-dated the Secret Service officer and Smith then alerted his own men.

Back in his workshop Arthur was now convinced that the interference he was seeing on the screen was from Alan. It just kept on repeating itself, so surely it couldn't be anything other than a cry for help?

While waiting for Mike to call him from Chale, Arthur looked around to see what he could take to help narrow the final search. Obviously his televisor - as small as it was - would be unsuitable as it was mains powered. Then he had a brain wave - why not take the experimental five metre transceiver he'd built?

The receiver was a super-regenerative type and it would be a very easy matter to adjust the tuning coils to the television frequencies. Quickly lifting it down from a shelf Arthur soon had it working, carefully adjusting the self-supporting silver-plated copper wire tuning coils by gently squeezing them while watching the televisor's screen.

Very soon Arthur had the same radio frequency pattern on the screen...albeit stronger than that apparently coming from Newtown. It was then that he guessed he must be using the same technique as Alan; "My, what a clever lad" he said; "he knew I'd be watching the Alexandra Palace picture". Then, as he concentrated on finding some dry cells for the filaments and a new high-tension battery, together with a portable aerial, he thought grimly; "Now we've just got to find you my boy"!

By the time Mike Cooley telephoned from Chale, Arthur had left for Newtown - but not before asking Freda to stay behind and co-ordinate things on the telephone. And although she wasn't happy, she knew it was important to keep everyone informed.

Following Arthur's instructions via Freda, Alan headed towards Newtown. It was well and truly dark by then, and both men fervently hoped that they'd meet on the road to Newtown. It seemed to take an age - but they were pleasantly surprised to arrive at the same time. Arthur stopped his ancient Morris and strode towards Mike's company van.

There was no time for pleasantries! "We can't direction find on him very easily Mike" said Arthur, his wheezing chest – the result of being gassed in the Great War - stopped him for a moment. "But we'll get a good idea of where he is because his signal will be stronger than Alexandra Palace here". Mike nodded agreement. Freda had told him what Arthur was planning and it made good sense to Mike.

Shadowy Building

After a half hour or so the two men were getting tired as they approached yet another shadowy building - the area did not yet have mains electricity - and they saw that it was a very large boathouse. They could clearly see the moonlight beginning to reflect from a narrow water channel leading to the building.

A large lorry - perhaps a farmer's cattle transporter? - was parked very close to the building. Indeed, it was so close that Mike thought it had been there for a long time and was perhaps used as a store.

Arthur already had the receiver operating. The only aerial he'd been able to bring was made from two stiff pieces of copper wire, mounted on a short length of broom handle forming a portable dipole. However, it was all that was necessary - the Morse signal was overwhelmingly strong - he could read the message from the signal 'thumps'. They'd found Alan, but without the receiver and Alan's initiative it would have been extremely difficult!

The two friends felt an immediate sense of relief as they heard faint shouts from within the building – they were in time but how could they rescue Alan? Mike, as the youngest and fittest - despite his favourite *Woodbine*s – started to climb up to the lorry's roof, determined to get in - and get in quickly.

Meanwhile, in bushes less than 200 yards away Weingartner and Stefan - who had been on their way back to recover their equipment and cover their tracks in any they could before leaving - decided that they would have to leave immediately to wait at their expected rendezvous and escape. They'd been beaten by only ten minutes but now the important thing was to meet their own rescuers at the agreed time. They turned, and headed overland to their small boat at the end of the estuary – they had to get home with the vital information.

To be continued....

A nice change - the umbrella's there to keep the sun off the West Kent ARS's G1WKS/P entrnat. Robin M0NZA (left) and Michael G8SRL suitably 'hatted' for the day! (overall position 25).

Hold your breath - how did your entry do this year? Neill Taylor G4HLX provides the final results on the 2004 contest. The good news is that more stations joined in this 'fun event' this year!

The Practical Wirel

Dave GW8ZRE/P obviously had superb weather at his Welsh hillside location (overall 3rd, Leading single-operator station).

Editor's thanks and acknowledgements: Once again it's my pleasant duty to publicly thank **Dr. Neill Taylor G4HLX** for all his hard work in organising, adjudicating and the many other (often unsung) jobs, which accompany his voluntary post. Thank you for 21 years of superb effort Neill! Thanks also to everyone who took part - and next year I hope to make up for my inability to join you in 2004. Best wishes everyone - here's to the next 21 years!

Rob G3XFD.

The 21st *PW* 144MHz QRP Contest took place on a hot sunny Sunday in June 2004, and for the second year running we had a welcome increase in the number of entries. A total of 86 stations sent in their logs and, judging by the number of QSOs that they record, the general level of activity has also risen again. Propagation conditions were not exceptional, but nevertheless plenty of impressive distances were worked using just 3 watts, much to the satisfaction of many operators.

The overall winners are the **Warrington Contest Group, G3CKR/P**, operators **Erik Gedvilas G8XVJ** and **Dave Leong G4WDL**, making the most of their 365m a.s.l. site near Leek, Staffordshire. Their antennas, a pair of M2 17-element Yagis, with the top one 26m above ground, put a good signal into all parts of the UK and beyond. This wins them the *PW* QRP Contest Winner's Cup, which they can place alongside the similar cups that they won in 1995 and 1996.

In second place is the **Coventry Contest Group M0CUS/P**, operated by M0CUS, **M3SDE**, **G8AIM** and **M0KCM**, achieving an excellent score from a hilltop in Gloucestershire. Their effort wins them a new trophy, the *PW* QRP Contest Runners-up Trophy sponsored by **Sandpiper Communications**, the well known antenna manufacturer based in South Wales.

Dave Hewitt GW8ZRE/P finishes in third place, and becomes leading single operator again, a result he also accomplished every year from 1996 to 2000. This time we have

another new trophy for him, the *PW* QRP Contest Single Operator Trophy, sponsored by **Nevada**, fully supported by Managing Director **Mike Devereux G3SED**.

Tennamast Trophy

North of the border, we have brand new winners of the **Tennamast Trophy in Memoriam to Frank Hall GM8BZX**, donated and sponsored by **Tennamast (Scotland) Ltd**.

The new winners are the **Auchinlay VHF Group GM0GMD/P**, on the Kilsyth Hills, operators **Tom** and **David Astbury**, **GM0GMD** and **2M1IGR**.

Trophy For EI3ENB/P

Over in the Emerald Isle, the leading station is **Paul Norris EI3ENB/P**. Paul, from County Kilkenny in Ireland wins the ***PW* EI/GI Trophy Clock**, donated by **Rob Mannion G3XFD/EI5IW**.

Multi-Operator Stations

A number of multi-operator stations had Foundation Licence holders amongst their operators. But there were also four M3 stations who put their own single-operator stations on air.

The leader of the M3 entries is **Adrian Greenhalgh M3SUD/P**, and he will receive

● Flying the flag at M0TWA/P. However, no-one is sure whether or not the RAF ensign was to warn low flying aircraft away or attract them as aeronautical reflectors! (Overall position 20).

ess 144MHz QRP Contest

Overall placings

Pos	Callsign	Points	Pos	Callsign	Points
1	G3CKR/P	9676	45	G6MXL/P	741
2	M0CUS/P	7070	46	G6LNU/P	689
3	GW8ZRE/P	6336	47	G4MCQ/P	648
4	GW4ARC/P	6156	48	G0NWT/P	646
5	GW7LQD/P	4228	48	G3MAE/P	646
6	G4RLF/P	4032	50	G4VRC/P	612
7	M0BPQ/P	3724	51	G8XQS/P	595
8	G1ORC/P	3600	52	G2XV/P	588
9	G0HDV/P	3224	53	GX4BJC/P	576
10	GW0PZO/P	3175	54	2E1GOP/P	572
11	G4ARI/P	3050	55	M0ADA/P	560
12	G7WAY/P	2898	56	EI6ARB/P	513
13	G1WOR/P	2794	57	G6DDQ/P	490
14	G3RIK/P	2714	58	G0PZR/P	450
15	G2CP/P	2376	58	PI4ALK/P	450
16	M0UKR/P	2175	60	G4IPE/P	448
17	GW4IDF/P	2160	61	G7NZO/P	432
18	M0WEN/P	2156	62	M3IWR/P	429
19	G3VEF/P	2016	62	GI7JYK/P	429
20	M0TWA/P	1995	64	G4HRS/P	390
21	GW4EVX/P	1805	65	GM4RIV/P	384
22	G0OVA/P	1748	66	G6LFN/P	363
23	G3BPK/P	1729	67	G1HDQ/P	330
24	M0CVX/P	1716	68	GM0ELP	308
25	G2HDF/P	1672	69	G0LJD/P	288
25	G1WKS/P	1672	70	M3ELC/P	272
27	G0WRS/P	1530	71	G2HR/P	264
28	M0IOW/P	1302	72	G4RYV	253
29	GC0HRG/P	1178	73	MW0CHZ	252
30	G3NJA/P	1139	74	MW0BGR/P	242
31	G0POT/P	1136	75	2E1GUA	190
32	M5CSM/P	1054	76	M0RPO/P	160
33	G4NVM/P	969	77	G6UBM	136
34	GM0GMD/P	935	78	MM1MDP/P	126
35	G1POS/P	885	79	G7TUA	120
36	GW3JXN	874	80	GI0RQK/P	112
37	GW3BV/P	850	81	G7HEP	60
38	G4XBG/P	840	82	G7XYZ	42
39	G0OIW/P	798	83	G7IIO	36
40	G8AWO/P	780	84	M3JWJ	27
41	EI3ENB/P	760	85	G6YYU/P	25
42	G0FUW/P	750	86	M0WTD	21
42	M3SUD/P	750			
42	M0EUK/P	750			

Leading multi-operator stations

Pos.	Name	Callsign	Score	QSO	Sq	Loc	Antenna	asl(m)	Tx/Rx
1	Warrington Contest Group	G3CKR/P	9676	236	41	IO93	2 x 17-ele M2 Yagis	365	TS940 +LTS2 transverter
2	Coventry Contest Group	M0CUS/P	7070	202	35	IO91	17ele Yagi	305	FT-726R
4	North Wales Wafflers	GW4ARC/P	6156	171	36	IO82	4 x 17ele Tonna Yagis	560	FT-736R
6	Salisbury and District Grand International Transmitting Society (SADGITS)	G4RLF/P	4032	144	28	IO80	6-ele quad	5	TS-770
7	Clifton ARS	M0BPQ/P	3724	133	28	IO91	2 x 9-ele DK7ZB Yagis	240	IC-756PRO + DEM transverter
8	Oldham Radio Club	G1ORC/P	3600	144	25	IO93	9-ele Tonna Yagi	600	FT-817
9	Ken Coxon	G0HDV/P	3224	124	26	IO93	13-ele Yagi	100	TR-751
12	G7WAY / G1UNQ	G7WAY/P	2898	126	23	IO92	17-ele Tonna Yagi	320	FT-847
13	Worthing and District Amateur Radio Club	G1WOR/P	2794	127	22	IO90	11-ele Tonna Yagi	189	IC-275
14	RADARS (Rochdale & District ARS)	G3RIK/P	2714	118	23	IO83	10-ele ZL	415	FT-290R

Leading single operator stations

Pos.	Name	Callsign	Score	QSO	Sq	Loc	Antenna	asl(m)	Tx/Rx
3	Dave Hewitt	GW8ZRE/P	6336	198	32	IO83	7-ele ZL and 12-ele ZL	561	TR-751
5	Mike Baguley	GW7LQD/P	4228	151	28	IO82	2 x Tonna 9-ele yagis	360	IC-275E
10	Charlie Jordan	GW0PZO/P	3175	127	25	IO83	9-ele Tonna yagi	545	FT-290R
11	Tim Raven	G4ARI/P	3050	122	25	IO92	14ele MET yagi	236	FT-817
20	David Simmonite	M0TWA/P	1995	95	21	IO93	9-ele Tonna yagi	350	FT-290R
21	Ron Price	GW4EVX/P	1805	95	19	IO83	9-ele yagi	526	FT-817
22	Tony Crake	G0OVA/P	1748	92	19	IO91	9-ele Tonna yagi	70	IC-706 Mk.IIG
24	Paul Bradbeer	M0CVX/P	1716	66	26	IO93	2 x 9-ele Tonna yagis	200	IC-910H
31	Michael Sansom	G0POT/P	1136	71	16	IO91	3-ele SOTA beam	210	FT-817
32	Chris McLaughlin	M5CSM/P	1054	62	17	JO01	11-ele yagi	75	FT-290R Mk.II

Results

Leading Stations

Category	Name	Callsign
Overall Winners	Warrington Contest Group	G3CKR/P
Runner Up	Coventry Contest Group	M0CUS/P
Leading Single Operator	Dave Hewitt	GW8ZRE/P
Leading Fixed Station	Dr. John Tindle	GW3JXN
Leading English Station	Warrington Contest Group	G3CKR/P
Leading Welsh Station	Dave Hewitt	GW8ZRE/P
Leading Scottish Station	Auchinlay VHF Group	GM0GMD/P
Leading N. Ireland Station	Peter Lowrie	GI7JYK/P
Leading Eire Station	Paul Norris	EI3ENB/P

Leading station in each locator square

Square	Name	Call	Entrants In square
IO62	Paul Norris	EI3ENB/P	1
IO63	John O'Sullivan	EI6ARB/P	1
IO70	Carolyn Rule	M0ADA/P	2
IO72	Dr John Tindle	GW3JXN	2
IO74	Peter Lowrie	GI7JYK/P	3
IO75	Douglas Maxwell	GM0ELP	2
IO76	Auchinlay VHF Group	GM0GMD/P	1
IO80	Salisbury and District Grand International Transmitting Society (SADGITS)	G4RLF/P	5
IO81	Malvern Hills B	GW4IDF/P	5
IO82	North Wales Wafflers	GW4ARC/P	5
IO83	Dave Hewitt	GW8ZRE/P	8
IO84	Adrian Greenhalgh	M3SUD/P	3
IO85	Steve Hartley	G0FUW/P	1
IO90	Worthing and District Amateur Radio Club	G1WOR/P	6
IO91	Coventry Contest Group	M0CUS/P	13
IO92	Tim Raven	G4ARI/P	6
IO93	Warrington Contest Group	G3CKR/P	6
IO94	Scarborough Amateur Radio Society	G2CP/P	3
JO00	1st Ringmer Scout Group	G4XBG/P	1
JO01	West Kent ARS	G1WKS/P	8
JO02	Alex Rowley, Mark Tuttle and Steven Rope	M0UKR/P	4
JO03	Eagle Radio Group	G4IPE/P	1
JO22	Alkmaar - Veron	PI4ALK/P	

Leading stations using a single antenna

Pos.	Name	Callsign	Score	Antenna	Tx/Rx
2	Coventry Contest Group	M0CUS/P	7070	17-ele Yagi	FT-726
6	Salisbury and District Grand International Transmitting Society (SADGITS)	G4RLF/P	4032	6-ele quad	TS-770
8	Oldham Radio Club	G1ORC/P	3600	9-ele Tonna Yagi	FT-817
9	Ken Coxon	G0HDV/P	3224	13-ele Yagi	TR-751
10	Charlie Jordan	GW0PZO/P	3175	9-ele Tonna Yagi	FT-290R
11	Tim Raven	G4ARI/P	3050	14-ele MET Yagi	FT-817
12	G7WAY / G1UNQ	G7WAY/P	2898	17-ele Tonna Yagi	FT-847
13	Worthing and District Amateur Radio Club	G1WOR/P	2794	11-ele Tonna Yagi	IC-275
14	RADARS (Rochdale & District ARS)	G3RIK/P	2714	10-ele ZL special	FT-290R
16	Alex Rowley, Mark Tuttle and Steven Rope	M0UKR/P	2175	13-ele Cushcraft Yagi	

the ***PW* QRP Contest Foundation Trophy**, which I'm personally introducing to replace the Novice Trophy awarded a couple of years ago.

The Tables

The tables show the other leading stations, including the leaders in each locator square. All of these will receive certificates. Every entrant who sent in the coupon printed with the rules will also receive a certificate stating their position in the results, the certificates again sponsored by **Chris Rees G3TUX**.

A full detailed results list is to be found on the contest website **www.contest.org.uk**

Computer Log Files

Apart from the number of entries, another welcome increase this year is the number of logs that have been sent as computer files by E-mail, totalling 45. This really does make my job as adjudicator significantly easier.

Those entrants who used the on-line form to submit their covering information also help to save my time, and again this was another big increase on previous years.

This year I was using a new system to keep all the records and facilitate the cross-checking of the logs. For those who are interested in computing, it's a web-based system written in HP and using a MySQL database.

In whatever format a log file was sent to me (and I do receive a few with particularly novel structures!), I managed to import all the QSO data into the database. Cross-checking of this data is then done by the software.

Of course, a lot of manual checking is still required of the logs received on paper, particularly to ensure that they receive as much scrutiny as the computer log files. The software helps with this by presenting the relevant QSO data for the checks between paper logs and computer logs. So only the cross-checking between different paper logs remains a real chore!

The situation now is a far cry from the situation in the first couple of years of the contest, when I remember being submerged in paper! Looking back 1984 was the toughest year, when we had 234 entries and the leaders made 470 contacts!

I had huge tables of data on A3 sheets of paper and it took six weeks of all my spare time to complete adequate checking to finalise the results. The following year I wrote a programme on the Sinclair ZX Spectrum computer, which at least eased the burden by keeping all the records of scores, points deducted for errors, etc. Although the cross-checking remained a manual process.

The original programme was written in BASIC, of course, with a couple of Z80 machine-code routines to speed up processes such as sorting the entries. Over the years this programme went through several revisions as I transferred it next to an Atari ST, then to a succession of PCs, using first GWBASIC, later QBASIC and eventually Visual Basic.

But this year I decided it was time for a complete re-write, to make direct use of the logs which were arriving in computer form. This was so that information could be taken from, and delivered to, the world-wide web.

Thus came the on-line form for submitting entries, while it looks the same as last year, actually now inserts information directly into the database. The results list that you'll see on the website is also generated directly from the database, allowing you to choose different sorting and filtering of the results (e.g. view just the entries from a selected locator square). It was successful, and even though I was still tweaking the system as I went along, it has definitely saved time and effort.

The benefits are not only for me as adjudicator, but also for entrants - when sending a computer log it's not necessary to highlight the first QSO in each square, as of course the software counts the squares worked. Nor do duplicate QSOs have to be marked in the log, the software will spot and ignore them!

I hope the incentives will lead to more entrants sending their logs by E-mail next year. It's noticeable that of 41 paper logs received, 14 had clearly been prepared on a computer. If only the files had been sent to me by E-mail, it would have saved my time, as well as saving paper and postage, of course. Although I will always welcome paper logs from those people who do not use a computer, in 2005 I shall

certainly be encouraging entrants to send log files by E-mail if at all possible.

Pleasure To Read!

In whatever form the entries arrive, it's always a pleasure to read the comments and reports that are sent with them. There are invariably some interesting experiences. **Mark Gray**, for example, reports that at **G8AWO/P**..." to cap it all as we were setting up, one of the release-programme Red Tail Kites circled our location...a really beautiful bird".

Encounters with wildlife are not uncommon at portable stations in remote locations. **Quentin Cruse GW3BV/P** notes that ...." my only company was an occasional Skylark and a few sheep".

Meanwhile operators at the **Halkyn Radio Group GC0HRG/P**, had another kind of encounter. Having set up the station on Saturday evening, three of the team remained on site overnight.

They report that; "halfway through the night, a very large herd of cows appeared in the previously empty field next to the site. Our masts were up against the fence so some of our guy ropes were in the next field and the curious cows were huddled up in front of us, dangerously close to the guy ropes. After some deliberation we decided that we would have to take the mast down to ensure that no accidents occurred. The nosy cows watched us with interest as we struggled to get the masts down in the dark and then, when they were sure we were done, they all wandered off to the other end of the field!" This is not so unusual, cows can be curious creatures (i.e. they have curiosity); one of my own early introductions to portable contests included a lesson in how to herd cows (away from the antennas!), a skill that has come in handy on several subsequent occasions.

Apart from animals, there are sometimes other features of the countryside to contend with. One of these was illustrated in a photo from **Mike Baguley GW7LQD/P**. "Check out the heap of 'stuff just behind the car", he writes, "it was just a tad smelly. The farmer stopped when I was setting up and asked if it was in my way; I'm not sure if he would have moved it if I said yes"!

Mike was without his fellow operator **Peter Lowrie GI7JYK** this year. After several years of joining Mike at the site in Wales, Peter decided to try a single operator entry back home in GI. "One thing that became instantly noticeable was the terrible conditions", writes Peter... "it seemed that r.f. failed to penetrate over the Irish Sea… maybe I'd been spoiled by working as GW for the past few years and had grown accustomed to hearing the white noise being violated by activity"!

Certainly, perception of the conditions and level of activity seemed to vary according to the location. For example, **Dave Hewitt GW8ZRE/P**, found conditions just fine at his site in North Wales; "I think this is the most QRA squares I have worked in a *PW* contest. Excellent conditions into Southern Ireland IO51 and South West England. The DX to DL was very good too".

Band Crowded

One consequence of a high level of activity is that the band becomes crowded, especially if operators do not make use of the full bandwidth available. **Roger Piper G3MEH**, who although not entering the contest but worked a number of contest stations, noted the problems.

Roger wrote; "What stood out to me was the high level of co-channel problems, which could have been much reduced if contestants had made better use of the spectrum available to them. Most were crowded into 144.220 - 144.330MHz which was a pity".

Tony Crake G0OVA/P, was another to comment on overcrowding and reports: "Why oh why do people not spread out more? Several times by spinning the antenna round I could monitor ***three*** different stations all yelling away on ***exactly*** the same frequency".

One reason that co-channel operation is more of a problem in a QRP contest (compared with a high power event) is simply explained in my opinion. This is because when two stations have antennas pointing in quite different directions they are much less likely to hear even a weak signal from each other that indicates that the frequency is in use. However, this is all the more reason to use the full range allowed for both s.s.b. and c.w. in the UK band plan, 144.150 - 144.400 MHz (but remembering to avoid the normal calling frequency 144.300 and the GB2RS frequency 144.250 during the morning).

And while we're on grumbles about operating practices, here's a valid one from **David Simmonite M0TWA/P**, who dislikes "stations not sending information in the correct order, i.e. report, serial, locator. It threw me no end of times and made for a very messy log sheet".

You're quite right David! Anything that might confuse the receiving operator is liable to lead to errors and lost points.

Enjoyable Contest!

As always, many entrants commented on how much they enjoy the contest. This is whether they are old hands, entering for the 20th time, or newcomers having their first taste of v.h.f. contest operating. Here's a selection...

"Thanks for the super contest, it gets better every year" - **Ken Coxon G0HDV/P**.

"This was my very first contest… I don't expect to win anything but really enjoyed a very good day and look forward to the next one"....**Brian Cartwright 2E1GOP/P**.

"What a wonderful day to be playing radio"...**Steve Bate G7NZO/P**.

"Tom and myself had a very quick introduction to competition operating. What fun it was and we hope to have the whole troop on the hill next year for a big effort" said **Tim M3EYP**, one of the operators of the **1st Ringmer Scout Group** station **G4XBG/P**.

"Another excellent day of *PW* contesting. Most enjoyable meeting 'old friends' on the band. This is my 20th year of *PW* contesting, first entry in 1984 as G1KVY/P. Still enjoy it and will be back"! - **Steve Hartley G0FUW/P**.

"Highlight of the day: a 59 report from G2CP/P near Scarborough at around 433km - not too shabby for 300mW and 3 elements" - **Kevin Ravenhill G1HDQ/P**.

Mishaps & Heart Attacks!

Finally, we are used to reading about mishaps described by entrants, for an example this is one from **Dave GW4DMR** of the **North Wales Wafflers GW4ARC/P**; 'The antenna mast trailer successfully jumped off the tow hitch twice and smashed the back windows of the Landrover"!

However, here is by far the most serious ever reported and it's from **Howard Colclough** ('The Man from Wem'), G7XYZ who reports; "Lovely contest this year, very relaxing to hear all the stations on the air. I sent you my log after the contest and then disaster, I had a heart attack next day! I blame the thrill of the chase and of course trying not to come last again".

Well, Howard, I didn't realise that contest operating could be so hazardous! But seriously, we all hope that you have made a full and lasting recovery, and look forward to hearing you in next year's contest (taking it a bit easier, maybe).

Glorious 12th Of June

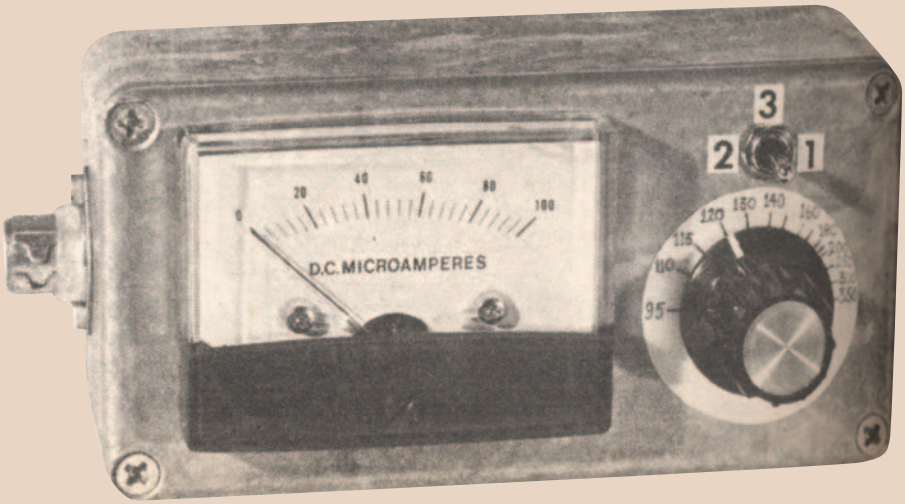
The date of the next contest will be **Sunday 12 June 2005**. Since no-one made any adverse comments on the move to the second Sunday on June, we'll stick with this, after agreeing the date with the **RSGB VHF Contest Committee**, who will also run the 2nd session of the 144MHz Backpackers contest on this date.

So, look out for rules of the 22nd *PW* 144MHz QRP Contest in *Practical Wireless* next year, and also keep an eye on the website **www.contest.org.uk**

Thanks to all who entered this year, and everyone else who came onto the band to work the contest stations, including **Tim Leeman G0MLM** who sent in a check-log. Let's hope that next year we can increase the numbers yet again! **Neill G4HLX**. PW

VHF Wavemeter & The 'CQ 2' Receiver

The Editor Rob Mannion G3XFD introduces the series: "This article - describing the construction of the most essential (but very simple) items of equipment which Radio Amateurs should possess – launches a series of previously published v.h.f. projects in *PW* as a direct result of readers' interest. They're aimed at providing you with a practical project and enjoyment".



Original photograph of the project as published in 1978.

The Amateur Licence (now regulated by Ofcom) requires that the holder provides equipment within the station that is capable of verifying that emissions are made only within the authorised frequency bands. The vast majority of modern v.h.f. transceivers use crystal control or crystal-controlled frequency synthesis (***see note below**). Hence only a relatively simple form of absorption wavemeter is required in order to comply with the licence regulations.

The absorption wavemeter is used to confirm that the desired harmonic has been selected. It will confirm that the output of the transmitter consists solely of the wanted signal with no unwanted radiation present.

***Note:** Nowadays of course v.f.o. control is the norm on 144MHz. However, it's very useful in the workshop especially as several *PW* projects in this series, to be published in the coming year, will use crystal controlled oscillators.

Editor

Wide Range

It's essential that the wavemeter covers a sufficiently wide range, both above and below the desired band. The frequency coverage should extend to at least the second harmonic of the desired frequency.

Attention should also be placed on the scale length and accuracy of the instrument. The wavemeter described in this article was designed to meet the licence requirements for a station operating in the 144MHz band.

The actual coverage is approximately 95 to 350MHz and the sensitivity is adequate for r.f. power levels of between 100mW and 100W. The wavemeter is designed so that it may be connected in the coaxial line between the transceiver and antenna and thus it can provide a continuous check on the output signal.

Circuit Description

The wavemeter circuit, **Fig. 1**,

Components List

Resistors

R1	22kΩ 0.25W 5%
R2	220kΩ 0.25W 5%

Capacitors

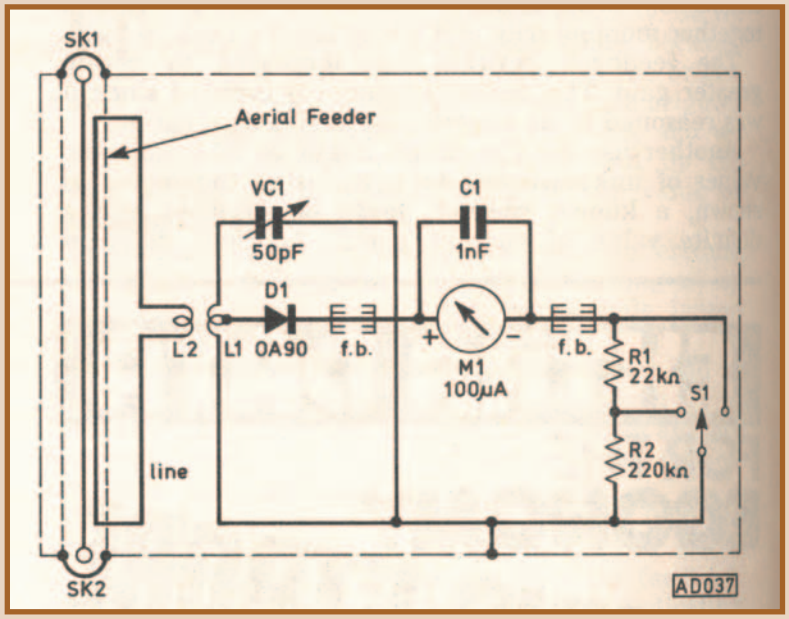
C1	1nF disc ceramic
VC1	50pF, Jackson C804

Diode D1 OA90

Miscellaneous

Meter, 100µA panel mounting, ferrite beads, two off, S1, Miniature single pole toggle switch with centre 'off', SK1 and SK2, standard surface mounting coaxial sockets. Diecast box 120mm x 60mm x 44mm, 140mm coaxial cable 'low loss', 18s.w.g. tinned copper wire for L1, 200mm 26s.w.g. enamelled copper wire. Tag strip, control knob with pointer.

This article, written by **Mike Tooley** first appeared in the April 1978 issue of *PW* and the text is original, except where essential up-dates have been included. **Editor**



● Fig. 1: Circuit of the 144MHz wavemeter (see text).

consists of a high-*Q* resonant circuit, which is tuneable by means of the variable capacitor, VC1. The resonant circle is mounted on the underside of the lid of a diecast box and is inductively coupled, by means of a small pick-up loop, to the antenna feeder, which is located in the base of the die-cast box. The loop is, in turn, coupled to a sampling line inserted in the coaxial cable feeder.

A detector diode, D1, is tapped well down the main inductor, L1, and a meter, M1, is used to measure the diode current. The current flowing in the diode is due to rectification of the signal voltage produced by the resonant circuit and this voltage is a maximum when the circuit is resonant at the frequency of excitation. Hence a maximum indication occurs at resonance and, since the tuned circuit is calibrated, it's possible to determine the frequency of excitation.

To reduce the sensitivity of the instrument a switch, S1, is used to introduce two fixed resistors in series with the meter movement. This facility is useful where high power exists in the coaxial feeder. By using a switch with a 'centre off' position it's possible to provide three different sensitivities for the instrument.

In practice the wavemeter may be connected either way round in the coaxial feeder due to the symmetry of the circuit. It's also possible to detach the lid of the wavemeter and use it as a conventional 'loose-coupled' instrument. This is done simply by holding it in the proximity of a circuit when r.f. is present. (The coupling arrangement in the base of the unit is then not required).

Diecast Box

The instrument is built in a small diecast box, which also acts as an earth screen. When you're choosing a suitable box, it's important to ensure that it's deep enough to provide adequate clearance for the chosen meter movement. The component layout, and related diagrams are shown in **Fig. 2**.

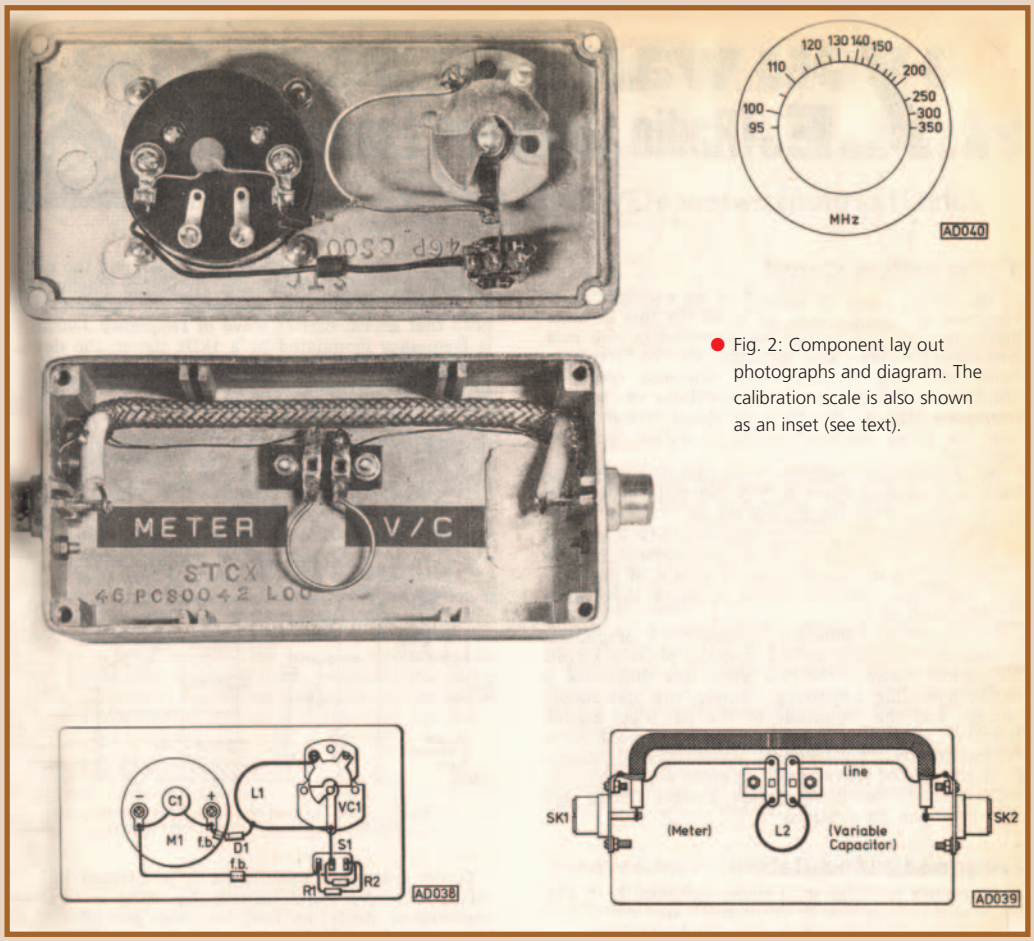
The coaxial line is made from a 140mm length of low loss coaxial cable (see component list). The outer pvc sheath should first be carefully removed and the copper braid 'bunched' to allow the sampling line to be introduced under the braid.

The line should be run inside the braid. (Please take care to avoid kinking). It should exit at about 20mm from each end of the cable.

The inductor, L1, is constructed using 76mm (3in) of 18s.w.g. tinned copper wire formed as shown in Fig. 2. The inductor is wired directly to the connecting tags of VC1. The inside radius of the bend in the inductor is 10mm. The diode tap is made at 25mm from the earth end (earth tag of VC1).

The inductor, L2, is constructed from 55mm of 18s.w.g. tinned copper wire. The inside radius of L2 is 9mm and it's supported by means of a miniature tag strip. The tag strip has two tags and is spaced 5mm above the base of the box, using the two fixing screws and additional 8BA nuts.

It's a simple instrument to build and use. Try one for yourself. **PW**



● Fig. 2: Component lay out photographs and diagram. The calibration scale is also shown as an inset (see text).

The CQ2 VHF Receiver

The second 'classic' project this month is a receiver using a super-regenerative detector. Such equipment has a reputation for 're-radiating' on the frequency it's tuned to - but with semiconductors this is minimal, and by using an r.f. stage - it can be eliminated, allowing the user to benefit from an extremely sensitive detector. Editor.

When it comes to v.h.f. most fixed Amateur Radio stations use either a transceiver, a crystal controlled superhet converter (with the s.w. receiver as i.f. and a.f. amplifier) or a de-luxe triple conversion receiver. However, these units are usually quite expensive or difficult to build and align, unless one has considerable experience of v.h.f. techniques.

The super-regenerative t.r.f. design described here will satisfy the needs of many s.w.l.s and prospective v.h.f. operators. As there's only one tuned circuit to adjust, it can easily be built in one evening and is not difficult to set up. Having only one tuned circuit, it is also very easy to change the frequency coverage.

The f.e.t. tuner is the heart of the device and if so desired, could be used on its own with a jack plug to feed into the input socket of a ready-made amplifier. In this case, the tuner could be made quite small.

Many readers will have dabbled around with the regenerative t.r.f. type of receiver, but in the super regenerative design, feedback is introduced (via the source to drain capacitor C3 in the author's design) beyond the point where oscillation just occurs and the stage is in continuous oscillation until this state is distributed by an incoming signal.

The super-regenerative state brings about a condition of extremely high sensitivity to the circuit; there is also a high level of circuit background noise, commonly referred to as 'slush' *.

***Editorial note:** I built this receiver not long after it was published (it was combined with a simple transmitter, and from personal experience there's minimal re-radiation, even when it's connected to a beam antenna.*

The Circuit

The complete circuit of the receiver is shown in **Fig. 1**. Even without the use of a separate antenna, the receiver has received good signals from aircraft, Radio Amateurs and other services up to a distance of approximately six miles.

Because the prime purpose of building the receiver was to receive local Amateur Radio transmissions* (**see note**) in the Taunton area of Somerset, the extra encumbrance of an elaborate antenna array has not been tried. I suggest that for experimental purposes an 450mm length of 18s.w.g. tinned copper wire is simply fitted to the centre of the coaxial socket. Vertical orientation of the aerial will normally bring forth optimum performance.

I've actually built more than one version of this receiver, but that shown in the photograph was built into a wooden cabinet already on hand. This was approximately 8 x 8 x 4in deep. As an alternative to the loudspeaker, a low impedance (80Ω) earpiece could be used.

***Editorial note:** When this article was first published amplitude modulation (a.m.) was still very much in use in the UK on v.h.f. This receiver although primarily ideal for a.m. reception, will reproduce wideband f.m. and narrow band f.m. (n.b.f.m.) although audio output is low. This can be overcome by using a modern high gain audio i.c. amplifier. Adequate filtering must be included in the a.f. input to remove noise and other products for the detector.*

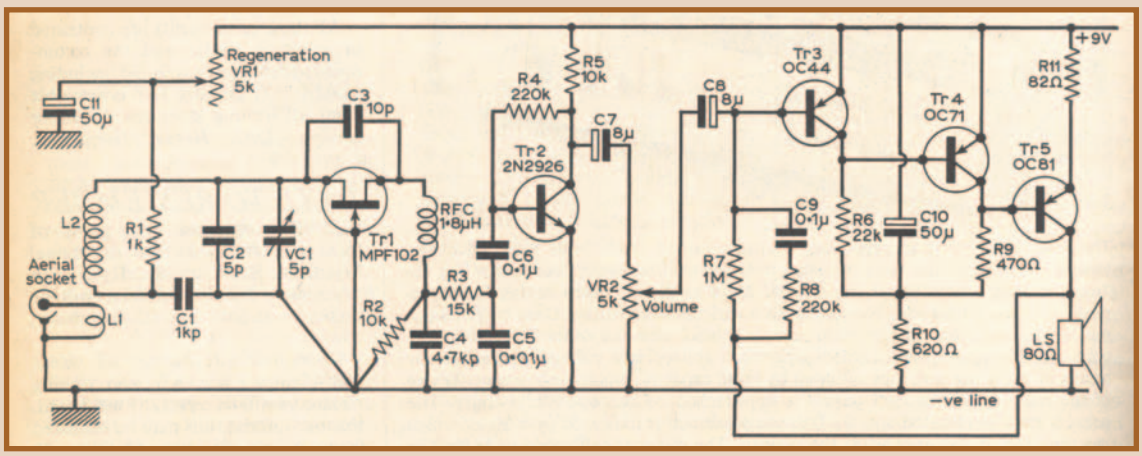


Fig. 1: Circuit of the super-regenerative receive suitable for either 70 or 144MHz use. Re-radiation is minimal from this circuit. Constructors may prefer to use a modern i.c. amplifier rather than the OC44/OC71/OC81 design shown. If such an alternative amplifier is used, G3XFD recommends that a ferrite bead or small value radio frequency choke (r.f.c.) is used to filter out h.f. and r.f. components from the audio output.

Layout & Construction

Although layout is important at v.h.f. and the effects of extra long wires and inter-electrode capacitances undesirable, the circuit allows considerable latitude, even on 144MHz. The original mock-up was in fact built up on a 1.1 x 2.5in (38 x 63.5mm) Paxolin board. Layout will depend on the cabinet and components used, but VR1 should not be

This article, written by M. J. Gordon, was first published in the September 1969 issue of *PW*.

more than 6in from the coil.

The variable capacitor VC1 was actually an Eddystone 35pF variable with brass vanes in the prototype. All these were removed, except for one stator and one rotor. The stator was cleaned and tinned and direct soldered connections were made to it.

The inductor, L2, consists of 3.5 turns of 18s.w.g. tinned copper wire close wound to a .25in (6.3mm) former. Tightly spaced, this will receive aircraft and stretched over 1/2in or so (13mm) it will also cover the

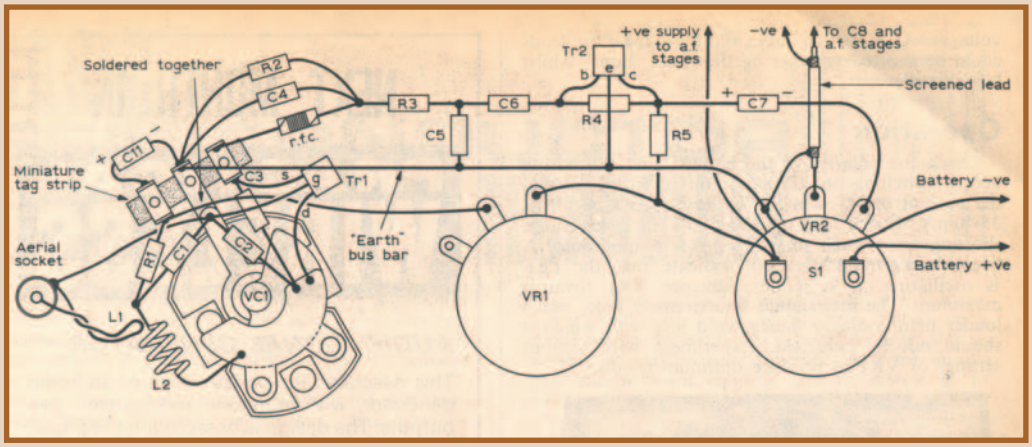


Fig. 2: Diagram illustrating the original author's choice of layout (see text).

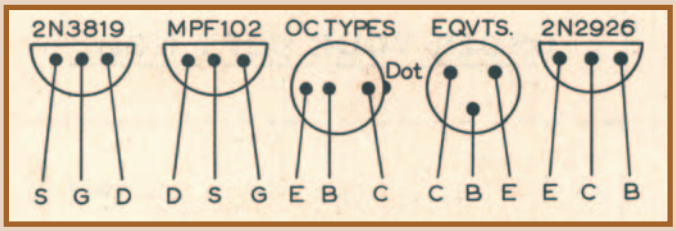


Fig. 3: Diagram showing pin-outs of the semiconductors used. Please note the pin-outs on the MPF102 and the alternative 2N3819 are different! (See text).

144MHz Amateur band. Naturally, the coil is sensitive to the effects of hand capacitance*. The antenna coupling coil L1 should be a half turn of the same wire placed near to the earth end of L2.

***Note:** This effect can be extremely frustrating and make tuning difficult. My personal recommendation is that an extra long plastic control spindle be added. It makes life much easier! **G3XFD**.

The 10pF feedback capacitor C3, if preferred, can be replaced by a conventional tubular variable type, which would also provide a good anchorage for the drain and source of the f.e.t. Alternatively, the unconventional variable 'twisted wire' variety may be used. About 1/2in (13mm) is sufficient to get the circuit 'started'.

The 1.8µH r.f.c. in the prototype was filched from a turret-type v.h.f./u.h.f. tuner, but this may be difficult to obtain. About 25 turns of very thin wire on a 1MΩ 0.25W miniature resistor works equally well.

Wiring should be kept as short as possible and the same tag should be used for all earth connections in the first stage.

Distinguish carefully the leads of the f.e.t. and if using the 2N3819, remember that the lead-out is different from that of the MPF102. Although the f.e.t. is silicon and should stand up to about 10 seconds heat from a 15W iron, it's best to use a heat shunt when soldering, such as long nosed pliers with a rubber band wound around the handles.

An earthed soldering iron should be used, as the f.e.t. can be damaged by mains derived capacitive voltages. As a further precaution, all the f.e.t. leads could be shorted together by the 'heat shunt' whilst being fitted.

Testing & Operating

Check the polarity of the battery and the wiring before switching on. If the circuit of Fig. 1 is used, the current drain on a 9V battery should be about 35-40mA. Check that none of the f.e.t. leads are shorting and switch on, with VR1 at minimum.

A lively background hiss will indicate that the f.e.t. is oscillating. If it is not, advance VR1 towards maximum. The hiss should be extremely loud, much louder than ordinary background hiss, with which it should not be confused. Experiment with various settings of VR1 to produce optimum results.

When a station is tuned in, there will be a reduction in the circuit background hiss, this depending upon the strength of the received signal. It's usually best to adjust L2 for the desired band when Radio Amateurs are usually more active on v.h.f. - particularly at weekends and during the evenings.

The only likely cause of trouble may be C1 working loose or fracturing as a result of the manipulation of L2.

The amount of radiated interference, once the scourge of this class of receiver, appears to be negligible. It's well worth trying it out yourself!

PW

Components List

Resistors (All 0.25W 10%)

R1	1kΩ
R2	10kΩ
R3	15kΩ
R4	220kΩ
R5	10kΩ
R6	220kΩ
R7	1MΩ
R8	220kΩ
R9	470Ω
R10	620Ω

Capacitors

C1	1000pF ceramic
C2	5pF ceramic
C3	10pF (see text)
C4	4700pF ceramic
C5	0.01µF ceramic
C6	0.1µF miniature
C7	8µF 12V electrolytic
C8	8µF 12V electrolytic
C9	0.1µF miniature
C10	50µF 12V electrolytic
C11	50µF 12V electrolytic
VC1	5pF variable (see text)

Semiconductors

Tr1	MPF102 or 2N3819
Tr2	2N2926
Tr3	OC44 (possible equivalent BC177/178/179)
Tr4	OC71 (possible equivalent BC212/213)
Tr5	OC81 (possible equivalent BC327/328)

Inductors

L1	1/2-1 turn, near earthy end of L2, 22s.w.g. insulated copper wire
L2	3 1/2 turns, 18s.w.g. tinned copper wire, 3/8in diameter, air cored
r.f.c.	1.8µH r.f. choke (see text).

Miscellaneous: VR1, VR2, 5kΩ potentiometer, S1 single pole on/off switch (may be combined with VR2), 80Ω loudspeaker, Paxolin board, tag strip, coax socket, battery clips, PP9 battery, wire, solder, etc.

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Kenwood TS-480HX

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The IC-756PROIII incorporates many of the features that made its predecessors so successful. However, the integration of the latest technology employed in the IC-7800 such as receiver technology, +30dBm class IP3, miniscope makes this new rig the very pinnacle of the IC-756PRO series.

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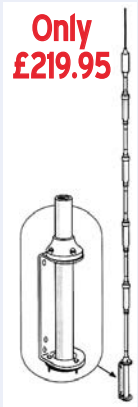

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6-BTV HUSTLER 80-10m Vertical 1kW.

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- VSWR 1.6:1 or better
- 10-40m Bandwidth up to 100kHz 80m
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- Solid 25.4mm traps
- Feed with any length 50 Ohm coax
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The ML&S Package Deal includes:
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Only £429
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To celebrate the fourth London store that Martin has opened, make a date in your diary for this very special one-day Saturday Bonanza. The main distributors will of course be there and we are trying to arrange a boot sale in our HUGE car park to the rear of the building. We know it's a bit chilly in December but if you have a ton of bits and pieces, load up your car and bring it down to the new ML&S site. No charge for display and FREE Hot coffee for everyone! Spaces first come, first served.

For more details nearer the time, check it out under 'News' on our web-site.

The new address is Outline House, 73 Guildford Street, Chertsey, Surrey, KT16 9AS and it's located between junctions 11 & 13 of the M25. By car, it's just 1.2 miles from junction 11 or you can come off at junction 13 (Staines turn-off) and follow the signs to Thorpe Park. Follow the first sign past Thorpe Park to Chertsey Town Centre then, after a sharp right bend, Guildford Street is on the right. It's spilt into three sections and if you enter the street from the Windsor/London Street end, you turn right opposite the Royal Mail sorting office.

By rail, Chertsey Railway Station is literally only 800 yards away in the same street. **By plane**, Heathrow is just 6 miles away.

Icom IC-7800

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No silly freebies, just the ultimate understanding and support you deserve when making an investment of this magnitude. To discuss the new HF+6M Super Rig from Icom, call the ML&S Sales team today. **RRP: £6400.00**

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Basic ready to go 100W HF Transceiver supplied with Microphone & DC Lead.
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Icom IC-R20E

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or 36 x £15.23 p/m

Icom IC-2200H

Just Arrived! 65W o/p 2M FM. The optional UT-115 provides digitally modulated and demodulated clear audio. It also allows you to send voice and data simultaneously. **RRP: £235, ML&S: £199.00**

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2/70 mobile 50/55W Transceiver with host of additional features.
RRP: £365, ML&S: £275.00
or £8.14 p/m

Yaesu FT-1000MP mkV

Still the flagship of theYaesu HF Range.
200W and put the CDXC IOTA crew on the map.

Yaesu FT-1000MP mkV Field

Ditto mkV but 100W and built in PSU.
RRP: £1999
ML&S: £Please Call for eye-watering price.

This inexpensive 1920s design for a 14MHz dipole offers some interesting parameters and is well worth consideration. Next time you feel the urge to play with bits of wire on a sunny summer day, produce an really old time favourite antenna in your garden.

Not interested yet? Then consider the following list of plus-points:

- No need for an a.t.u. (although it can improve things a little).
- Low s.w.r. over the entire 14MHz Amateur Band.
- Good DX performance.
- Low cost assembly.
- Good power rating. (100-400W - will work well on only 10W)
- Great eye catcher! (Make the G5RV boys jealous!)
- Easy to obtain components.
- Simple to construct.
- Coaxial cable - baluns are optional.
- No rotators needed
- No costly masts.

As you can see from the list above, early radio pioneers knew a thing or two!

Over 80 years ago on 6 March 1922 the newly formed British Broadcasting Company (later to become the British Broadcasting Corporation) commenced their Scottish Wireless Broadcasting Service in Glasgow. The pioneering BBC radio engineers of the day decided to use an antenna or as they would call it a 'transmitting or Sender Aerial', which would give broadband operation.

Transmitter effectiveness tests had shown that a horizontally mounted 'cage dipole' would provide a good coverage service throughout central Scotland. The antenna was mounted between two high factory chimneys at a site in Port Dundas near the middle of industrial Glasgow. This was the type of antenna used to introduce Scotland to public radio broadcast transmissions. As of course, it appeared in many other areas of Britain around the early 1920s.

Cage dipoles are still very much in use for many commercial radio stations and are used extensively on v.h.f. broadband services for aviation and maritime needs. They have simply refused to lie down and die, even after over 100 years in service. Marconi used them extensively in his maritime and broadcasting radio stations.

Their great attraction at v.h.f. is that they are fairly small, easily erected, combined with tuned resonators can give service in multi-channel operation. The v.h.f. types are often constructed in rigid format using heavy gauge wires or rods.

The wire variety used in the 1920s and 1930s for h.f. bands of Amateur Radio has lost popularity in recent years. This is due to being rather cumbersome and prone to windage problems, as well as difficulty in obtaining appropriate components.

This article describes how you can make one very cheaply and give yourself some DX surprises into the bargain. If you live in a windy location it might be best to build your cage dipole early in the Spring and take it down before the Winter gales. However, if you make it of a strongly constructed variety it will survive even a hurricane or two.

Amateur Radio is not just about collecting QSL cards or shouting "5&9 om - QRZ?" across the planet! It's also about having fun experimenting and who knows, maybe you will discover something new and exciting using this ancient, but worthwhile, design. And you get to say in your QSOs "I made it myself".

Shopping List

For the cage itself, you'll need 40m (130ft) of good heavy Flexiweave copper wire with clear pvc cover (cut into eight lengths, each of five metre). Use the best quality Flexiweave you can get, though if you've nothing else you can use hard drawn copper wire or even mains cable. The latter choice may not survive too long, but should be fine for a trial period.

You'll also need: one plastic spacer (such as a 600Ω feeder type) or make your own,

Looking At Construction

Now let's look at the construction. The most unusual components to obtain are the 230mm (9in for old timers) plastic rings. The rings must be approximately this diameter to work properly between 14 and 14.35MHz. I made mine from a children's plastic toy game called 'Dom Dom'. This game consists of two plastic bats like round tennis racquets with clear plastic instead of mesh in the middle.

In the game, the bats are used to smack the hollow plastic balls hence the onomatopoeic name due to the drum-like noise. It's just the kind of thing grandparents bring for younger kids on a quiet Sunday afternoon, so annoying already stressed parents.

Each game set has two bats so you'll need three sets to make your rings. These games can be found in most toy stores or street markets that sell cheap toys. There are similar game bats around so use your hunting skills. But try to get as near to the 230mm (9in) diameter as possible.

Once you have your plastic bats simply cut out the plastic skin or mesh in the middle and cut off the handles carefully with a hacksaw. When cutting off the handles do not cut too near the rim as the rings are often hollow.

You now have your six antenna rings ready for drilling. What you do with the six plastic balls, and the pieces of handle left over, I leave to your imagination!

Drill four 5mm holes in each ring as per **Fig. 1**. Now thread the four lengths of the heavy flexiweave copper wire through three sets of rings**.** With the other four lengths of wire and three other 'ring', repeat the threading to give you the other half of the cage dipole. Secure the wires in the rings with small insulated copper wire ties, see **Fig. 2**.

Ensure your rings are equally spaced. I found it helpful to fix one end of the set of wires to a hook on a fence post whilst assembling the antenna at this stage. Finally, connect, either by soldering or using single pieces of chocolate block type connector, a 75Ω

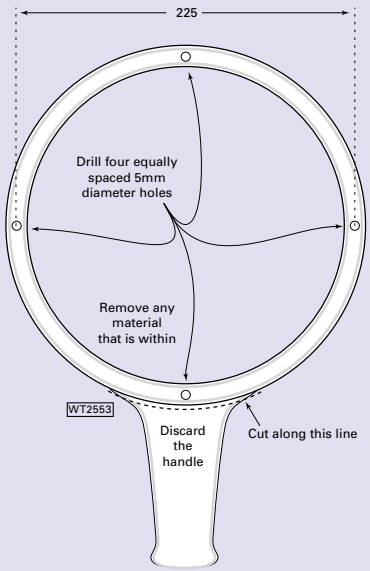


Fig. 1: Cutting and drilling details for the plastic racquets, you'll need six of them for this design.

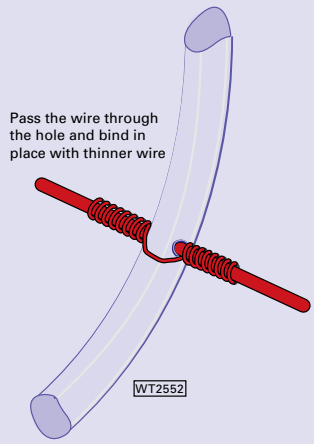


Fig 2: Details of the method of clamping used in the cage antenna.

Fig. 3: A closer look at the centre of the antenna at Ian's location.

two: 'Dog Bone' Insulators, two off: fishing swivels (optional), six off: 230mm (9in) hollow plastic rings (see below for details), suitable length of 75Ω twin feeder wire (flexible). The length of this wire will depend on the distance between the antenna and transmitter. (I've found that twin black/red low-voltage power {6/10A} cable is approximately 75Ω and works very well). You'll also need scraps of insulated stiff copper wire. (bits of mains cable will do nicely), as well as a roll of self amalgamating tape.

twin feed cable without a balun, **Fig. 3**. I've found that this type of feeder will give much better results and less TVI. Please note, that if you do use 75Ω coaxial cable feed, you should fit a 1:1 balun at the feed-point.

Once you have assembled the antenna wrap all joints and bind the ends of the cage wires with self-amalgamating tape to waterproof and add strength. Each of the 'outer' ends are then fixed to a dog bone insulator. Fishing line swivels at the end dog bone insulators are optional but they do help reduce wear and tear as the cages tend to revolve in the wind. The support ropes or lines may be added.

At the centre point of the antenna, the four wires are similarly joined to each feeder wire. You've created a four wire simple 'fat' or cage dipole, as shown in **Fig. 4**. Please remember, cage dipoles tend to be quite heavy so the mount points must be strong and secure. The effect of wind (or 'windage') can be anything from four to six times greater than a G5RV or W3DZZ type dipole.

When assembled you will be the proud owner of a 14MHz Cage Dipole and the envy of all those guys with boring old single bits of wire and the friend of all the wee birds in your garden.

What Results?

So, what results, have I had with this antenna you may ask. Well, from my QTH in South West Scotland I've had regular contacts on voice with Brazil and the USA (and with Australia when using summer 'grey-line' techniques).

One of the delights of using the cage dipole is that there is really no need for an a.t.u. as it has a very flat response over the whole 350kHz (UK) allocation on the 14MHz Amateur Band. A low s.w.r. should be possible over the entire band if the lengths of your wires are cut accurately.

For good DX it's best to mount the antenna as high as you can. If your garden is small try using it as a 'sloper' from say the chimney to a post about two to three metres off the ground. As an inverted V antenna it will still perform well.

The 14MHz Cage Dipole that I put up worked extremely well, until a very strong gale broke it at the centre point. I'd not used very good Flexiweave wire to be honest so, it was remarkable that the antenna had survived for so long during the winter storms that we experience here on the coast.

Come on all you new M3s, this is your chance to really impress the neighbours with a great eye catcher! It should give you great results even with 10W.

I would appreciate reports by E-mail if you build this antenna and also details of how you found your rings? You can contact me by E-mail at **weebooks@globalnet.co.uk** with reports. Good DX!

PW

CAGED

A Beast of a Signal!

Ian Macdonald MM5WIG suggests that a step back in time, with his low cost 1920s style 'Cage Dipole For 14MHz' will be a step forward for your signals.

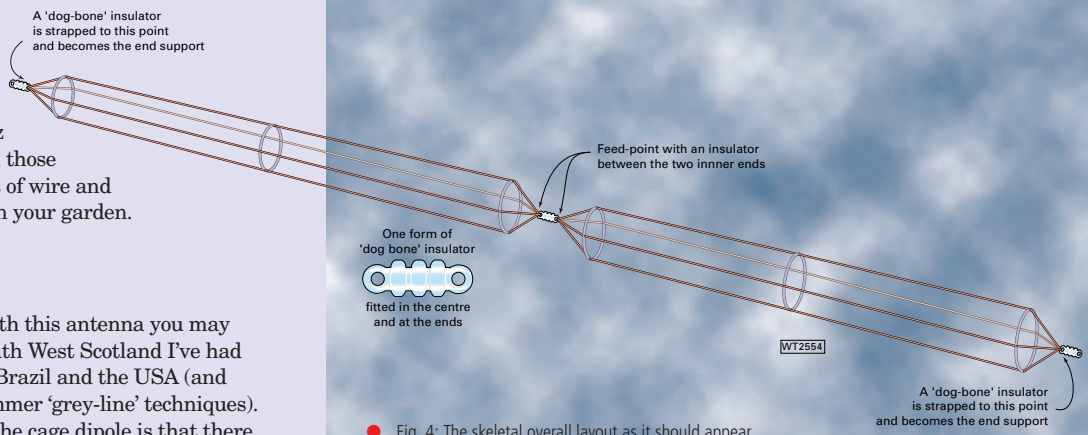


Fig. 4: The skeletal overall layout as it should appear when erected. Ian recommends, using 70/75Ω twin rather than coaxial cable to feed the antenna.

Eddystone enthusiasts have a double dose of vintage nostalgia this month! Firstly, Ben Nock G4BXD takes a detailed look at the truly British 'classic' receivers originating from their Birmingham factory. Eddystone fans can then also find more in Valve & Vintage on pages 54-55.

The Classic Eddysto

Eddystone is undoubtedly the most well known brand of receivers in the UK. A large number of Radio Amateurs and short wave listeners have used Eddystone equipment for many years. The company had an interesting history - a little too complicated to go into detail here - but suffice it to say I think they produced some of the finest sets in the world.

Sadly though, as all things must, the Eddystone name is no more. Imports of electronic 'plastic toys' from far away places and a general reluctance to buy home produced equipment has seen the end of this company.

As my tribute to the Eddystone Radio company I'd like to provide you with an insight into a few of the sets from yesteryear. Many newcomers to the hobby may not be aware of just what was available a few years ago. Having a small collection of these sets myself, I'll go through a few here, not in any particular technical order...rather a chronological view of the past.

Fig. 1: The Eddystone 750, a truly classic British receiver (see text).

Fig. 2: The Eddystone 870A (see text).

Fig. 3: The Eddystone 730/4

The Eddystone 750

I'll start off with the Eddystone 750, **Fig. 1**, a general coverage communications receiver, which was produced from 1950 to around 1958 and was a most advanced set in its time. It's a double conversion superhet, with two intermediate (i.f.) stages of 1620kHz (1st i.f.) and 85kHz (2nd i.f.). The set is a four band receiver tuning from 480kHz to 32MHz with a small gap between 1.460 and 1.7MHz.

The receiver employs 11 valves and has facilities such as a beat frequency oscillator (b.f.o.) for c.w. and s.s.b. reception, a noise limiter, separate r.f., i.f. and audio gain controls together with a variable selectivity control. The super large horizontal tuning scale (complete with separate rotating logging scale) has the various h.f. broadcast bands and the Amateur bands marked for easy reference. The band switch has an added position (marked as 'G'). This indicates a 'Gram' facility. This meant that a socket on the rear allowed the user to plug in the output from a record deck and use the receiver as the amplifier. The price in 1950 was £78.

The Eddystone 870A

The Eddystone 870A receiver, **Fig. 2**, has the same styling as the 750 but is a much simpler set. The receiver is a single conversion superhet design with an i.f. of 450kHz, seven valves, and can run from a.c. or d.c. supplies. That means it rectifies the mains directly...with no 'mains isolation'! The 870A tunes from 480kHz to 30MHz in four bands.

The original 840 came out in 1953 with the 840A produced from 1954 to 1961 at an original cost of £55. The receiver has an internal speaker, and a noise limiter along with a tone control are also provided.

The Eddystone 730/4

The Eddystone model 730, **Fig. 3**, is a Military specification communications receiver. Many were used by Military and Government departments before finding their way onto the surplus and hence the Amateur market.

Produced from 1954 to 1961 and costing a massive £235 at the time, this set has features such as crystal calibrator, crystal i.f. and audio filters, variable selectivity and an S-meter. Using 15 valves the receiver is single conversion design with an i.f. of 450kHz and tunes from 480kHz to 30MHz in five bands.

Many variants of the model 7300/were produced with suffixes of /1A to /10. The most common

seems to be the 730/4 and this model is believed to hold the Eddystone company record for most sets produced.

The Eddystone 870

The interesting little Eddystone 870 receiver, **Fig. 4**, was intended to be used in the cabin of passenger ships to while away those long sea voyages to far away places. Produced between 1956 and 1959 the receiver is again an a.c./d.c. model, tuning from 150kHz to 18MHz in four bands, costing £34 when introduced.

Using only five valves, including the rectifier, the 870 is a single conversion superhet.

one Receivers

(see text).

Fig. 4: The Eddystone 'Ship's Receiver' Model 870 (see text).

Fig. 5: The Eddystone EC10 - much in demand as a tuneable i.f. v.h.f. down converters in the mid 1960s (see text).

It has a built-in speaker and has only the simplest of controls. At around 270 by 160mm it was the smallest of the post Second World War sets produced by Eddystone.

The Eddystone 888A

The Eddystone 888 and the later 888A were one of the few sets specially built by the company for the Amateur Radio market. The receiver is a double conversion superhet tuning the old 1.8 to 28MHz (Non WARC bands) amateur bands with i.f.s of 1620 and 85kHz. Some 11 valves are used in the set and again, various additional features are provided.

Separate r.f., i.f. and audio gain controls were provided on the 888. Also provided switchable automatic volume control (a.v.c.), a crystal calibrator, an audio filter and noise limiter, variable selectivity and the option of a plug-in S-meter. The original 888 simply had a diode detector with b.f.o. for c.w. and s.s.b., but the later 888A was improved with the addition of a product detector stage for that mode.

The 888A was produced between 1957 and 1962 at an original cost of £110. After years of making do with ex military equipment or home-brew gear many an Amateur Radio station operator was keen to upgrade to this new and exciting receiver.

The Eddystone EC-10

There's no doubt about it in my opinion - the little EC10 receiver, **Fig. 5**, is probably one of the best known Eddystone products. A fully transistorised set, the EC-10 took the market by storm, costing £53 when first introduced. Every shack in the late 1960s seemed to have one and they were well loved by their owners.

The ability to operate anywhere made the EC10 a 'must have' for 'portable operation' enthusiasts, and was very popular as a tuneable i.f. for v.h.f. down converter.

The set is a single conversion type, using an i.f. of 465kHz, tuning from 550kHz to 30MHz in five bands.

The EC10 uses 10 transistors and offers an audio filter for c.w./s.s.b., and r.f. and audio gain controls. It is also provided with dial lamps and switchable automatic gain control (a.g.c.).

The receiver could be powered by batteries carried in a holder accessed at the rear, or a mains power pack could be fitted for home use. The EC-10 MkII had the extras of an S-meter and 'fine tuning' controls fitted. However, otherwise it was the same circuit. Various models were produced for marine and Post Office monitoring use.

Transmitters & Accessories

Eddystone not only produced receivers, but at various times they manufactured transmitters and accessories. An early transmitter, made by the Stratton Company (which later became Eddystone) was the Type S440 transmitter, part of a v.h.f. radio telephone transceiver made in the mid-1940s.

The company went on to built other transmitters and the accessories included Bug keys for Morse, field strength meters, modulation meters and such.

Eddystone Styling

The styling of Eddystone sets has always been impressive in my opinion. The early sets, the 504, 640, 670, 680 and 840 for instance, were fitted with the style A case, this being quite large and having the square centre tuning dials.

Later sets, the 750, 840A and 730 for example, used the style B case. This was of the same overall size but with the long tuning window. Even later sets used the style C case, this still had the long tuning window but the case lost its fluted effect and was replaced with a smooth flat finish.

The 'baby' Eddystones, the 820, 870 and 930, were housed in the style D case with the EC-10, EB-35, 36 and 37 housed in the style E cases. The more recent 990R and 990S were in the slim line F form style cases.

There are of course many other sets that Eddystone produced, far too many for such a short article as this! However, I hope I've given you a 'feel' of what these sets provided - especially to those of you who are new to the game.

In general most of the Eddystone receivers are a joy to play with and a delight to own - try one for yourself! And if you do start looking for a suitable set more info on Eddystone equipment can be obtained by joining the **Eddystone User Group** (EUG), by contacting **Graeme Wormald G3GGL, 15 Sabrina Drive, Bewdley, Worcestershire DY12 2RJ**. (E-mail enquires can be sent to **g3ggl@euphony.net**).

The facts and figures I've included in the article were taken from EUG material and I thank the group for permission to reproduce the information. Enjoy your Eddystone!

PW

practical way

"What I dream of is an art of balance".

Henri Matisse (1869 - 1954)

The Rev. George Dobbs G3RJV enjoys hearing from his readers and very often, the correspondence leads onto further ideas for COTPW. This month, George - having chatted to a reader - looks at the useful AC Bridge.

Some time ago a reader of this column entered into correspondence with me about measuring capacitors and, as usual, it led to some more ideas! So, let's take a look at the subject.

There are several methods of evaluating capacitor measurement. The easiest of which is if you happen to own a digital multi-meter, which provides the facility for capacitance measurement.

Although my favourite instrument for the task is the excellent AADE digital capacitance and inductance meter. I did mention to the reader the use of an AC Bridge, a classic method to measure capacitance and resistance.

Some years ago I described the building of the classic AC Bridge, so I thought it might be useful for some readers for me to describe the instrument again. They are easy - and cheap - to build. They can be added to the armoury of the constructor's work bench, if only as a quick means of checking the value of those capacitors with indistinct markings.

Wheatstone Bridge

The circuit is based upon the Wheatstone Bridge, that popular circuit known to all students of school-day physics. **Note:** The Wheatstone Bridge used in the school physics laboratory is usually a d.c. instrument, which makes use of a meter for measurements. The bridge described here is an a.c. instrument, which uses an audio tone and eliminates the need for an expensive meter.

The bridge circuit is shown in **Fig. 1**. The bridge itself comprises R2 and the 'standard' and 'unknown' terminals.

If R2 is arranged with the slider at the centre of the potentiometer track, in effect it forms two resistances. The resistance between the slider and the top we can call Ra and the resistance between the slider and the bottom of the track, we can call Rb.

Two resistors could be attached across the open terminals; Rs across the 'standard' and Rx across the terminal marked 'unknown'.

The transistor, Tr1, forms an audio oscillator with an output at the secondary of transformer T1. This audio output is applied across the bridge and a pair of headphones is applied between the other two sides of the bridge.

If the values of the standard and the unknown are equal (Rs = Rx) and the potentiometer is set at the centre of the track (Rs = Rb), then the bridge is 'balanced' and no audio tone will be heard in the headphones.

This can be represented as;

Rs = Ra

Rx Rb

Since Rs=Rx and Ra=Rb, there's no output, and this is called the "null point" and will be shown by no audio output at the headphones. This method of using an audio signal to indicate a null point is quite accurate because the ears have a logarithmic response to sound – in practical terms this means the lower the sound, the more sensitive the ears become to changes in volume.

"Here's one I built before"- George G3RJV describes the building and use of the AC Bridge - a simple instrument, which he thinks is very useful in the workshop.

The equation I've just presented shows that the ratio of the unknown to the standard is equal to the ratio of the resistance of each side of the potentiometer arm. If the unknown differs from the standard, R2 can be adjusted to find a null point.

The position of the slider on R2 will then represent the ratio of the unknown to the standard. In use R1 can be fitted with a pointer knob to indicate this ratio on a scale. The scale will be logarithmic, either side of 1:1 in the centre.

The action of the AC Bridge also applies to capacitors and the ratio of an unknown capacitor to a known value can be found. It's common for bridges to have switched values of standard resistance and capacitance which provide a series of ranges for the instrument.

However, the circuit I'm providing provides for the user to use their own standard value components. This not only makes the instrument simpler, but also enables a wide range to be obtained against available known values. The bridge can also be used to match pairs of resistors and capacitors.

Hartley Oscillator

The audio oscillator used in the bridge is a simple Hartley type based on a tapped transformer. I used an **LT700** transformer, which is designed for push-pull audio output circuits. The Eagle LT700 transformer is stocked by **Bowood Electronics**; listed as SOP056 in their latest catalogue. They can be found at **Bowood Electronics Ltd., 7 Bakewell Road, Baslow, Derbyshire DE45 1RE**. and at **www.bowood-electronics.co.uk** (**see advert in this issue**).

It is also available from **Partridge Electronics, 54-56 Fleet Road, Benfleet, Essex SS7 5JN** or **www.partridgeelectronics.co.uk**

The LT700 has a 1.2kΩ, centre tapped primary with a 4Ω output

winding. The resistor, R1, provides the base biasing and the output is taken to the bridge from the secondary of T1. A push button switch (PB1) is used to switch the oscillator on.

Sound Detection

The sound detection of the null at the 'out' (output) terminals and can be done using a pair of high impedance headphones but these are rare 'beasties' these days. Fortunately, a crystal earpiece is a good, and cheaper, alternative.

I used a socket (which must be insulated from the case) and plugged the unit into a small bench audio amplifier. Over the years I've described many simple audio amplifiers in COTPW that may be used as the audio detector in this circuit. Hopefully you'll have one handy!

My audio oscillator is built on Veroboard; a rare construction mode for me but beloved of many constructors and **Fig. 2**. shows the board layout. It's built onto a piece of board with 12 holes by seven holes.

Note: There's a saw cut across the tracks of the board under the transformer mounting position. This is best made by carefully cutting away the copper using a sharp hacksaw blade held flush to the board.

After making the cut, inspect the board to ensure that none of the adjacent tracks have been pushed together causing them to short together. You can clear any loose copper with a sharp pointed knife.

The transformer is best mounted first in line with the saw cut (underside). Then mount C1 and R1 followed by R2. The leads to the battery and R2 are mounted last.

The transistor, Tr1 can be almost any common pnp device. However, in my stock I have a lot of the common 2N2222A transistors though on this board I used a BC109.

Critical Potentiometer

The potentiometer, R1, is critical in this circuit and should be as good a quality component as can be found. I happened to have a large wire-wound potentiometer. Odd – because I usually throw wire wound potentiometers away!

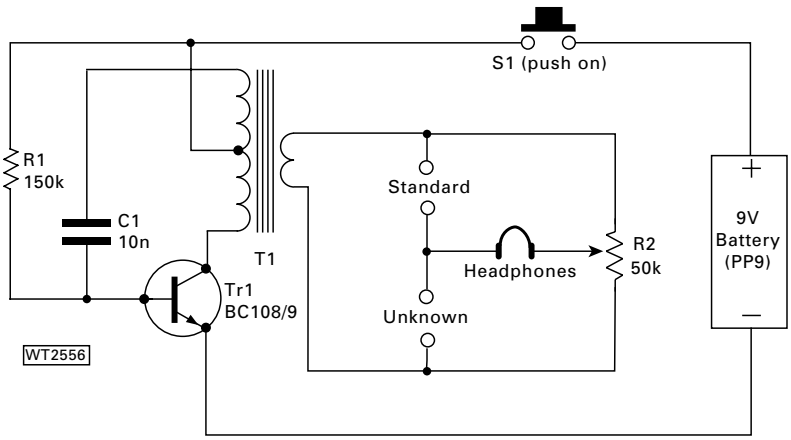
If such a jumbo sized potentiometer is not available, I suggest you use the largest potentiometer you can find, carbon or wirewound, with a value of 50 to 100kΩ. For this application, the larger the potentiometer's track, the better it will work.

The layout of my version, built many years ago, is shown in **Fig. 3**. The control R1 is mounted in the centre of the square front panel, which is the lid of an aluminium box. Three 4mm sockets are used for the 'standard' and 'unknown' component terminals with a common centre socket.

I made a cursor from a piece of scrap clear Perspex to enable clearer readings from the scale. The scale is actually a very important part of the bridge and it's a non-linear scale marked out on a piece of plain card and glued on to the front panel.

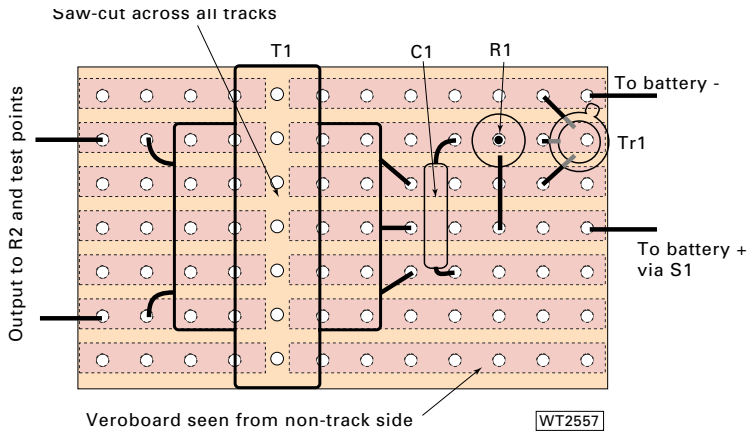
The scale can be drawn directly on the card by hand or nowadays by using computer aided design (CAD) software. But in the days when I made my prototype, I used Letraset rub-down lettering!

The front panel was finished with, and protected by, a layer of clear sticky-backed plastic film. The calibration of the scale can be done mathematically (it's a logarithmic scale) or by using good values of resistors to determine the markings. Some readers might even like to copy the scale in the photograph.

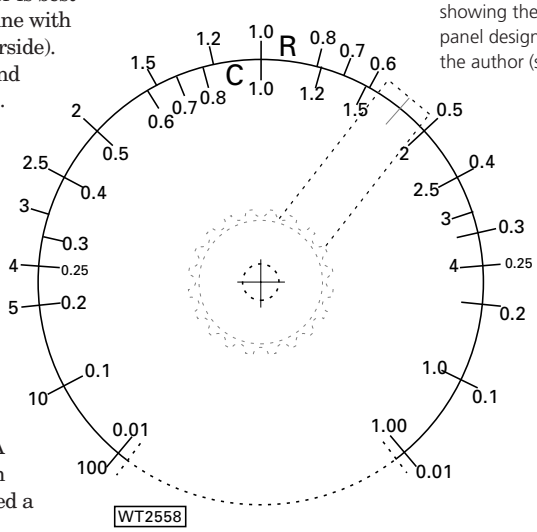


● Fig. 1 (above): Circuit of the a.c. bridge project described in this month's COTPW.

● Fig. 2 (below): George built this project using Veroboard. The diagram shows the relative track positions (see text).



● Fig. 3: Diagram showing the front panel design used by the author (see text).



Before You Start

Before you start using the bridge, it should be set to an accurate (as possible) 'zero' point. This can be done with two close tolerance resistors of the same value. These are plugged in across the 'standard' and 'unknown' points.

It's not difficult to connect the resistors without using a 4mm plug. Bend the leads into a tight 'U' shape and push them in the sockets. If the wires are spread just wider than the gap between the sockets, the rigidity of the wires will hold them in place.

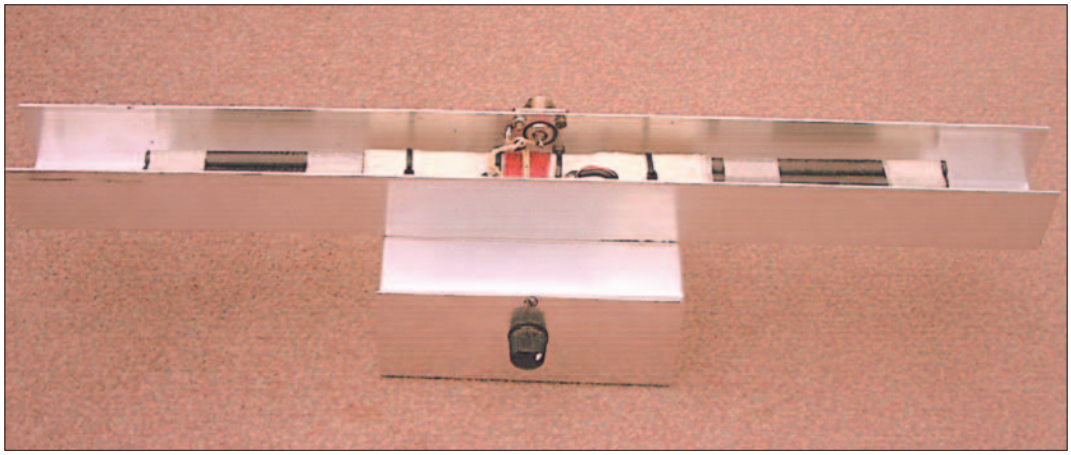
With the two resistors of the same value in place, plug in the headphones, earpiece or audio amplifier. Press the push-button, PB1, and it should be possible to find a null point with no sound. This point should read as 1:1 on the scale. If it's not on 1:1, adjust the knob on the spindle of the potentiometer until the cursor shows 1:1.

The instrument is simple to use. Close tolerance components make ideal reference standards and a stock of suitable standards can be collected to keep to use with the bridge. The known value is plugged in the 'standard' socket and the unknown component into the 'unknown' socket. The S1 is pressed and R2 adjusted to find a null in the audio output.

Observing the scale, when you're using the bridge to identify the component's value by defining the null point, the unknown component will be higher or lower in value as shown on the scale. **Note:** Be aware that the reading direction is opposite for resistors and capacitors.

The AC Bridge is a simple, almost classic, instrument that still has its uses on the Amateur Radio work bench. Try one for yourself! **PW**

Antenna Workshop



John Heys G3BDQ shows you how to build a directional receiving antenna for the 1.8MHz band to null out man-made QRM.

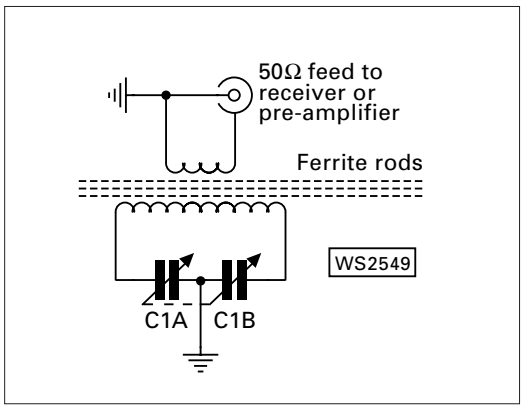


Fig. 1: The complete circuit of the ferrite rod antenna. The inductor L1 has an inductance of 60µH and is wound over the centre of the rods. Capacitor C1 (A and B) is a dual-gang variable capacitor, each section having a maximum capacitance between 200 and 300pF.

As each year goes by, it seems that man-made noise in urban areas, particularly on 1.8MHz ('Top Band') gets worse and worse. This seems especially noticeable when an efficient transmitting antenna is also used for reception. The situation can then become dire, with little DX or weaker stations able to overcome the noise.

Often, after a little investigation, it may be found that the offending QRM will be coming from just one direction. So, if this is the case, then having a separate receiving antenna, which has a deep null in its reception pattern can be a very effective solution.

Looking through my mountain of antenna literature, revealed an old (1977) design attributed to the late **Doug deMaw W1FB**, that employs ferrite rods as the basis for such an antenna. The characteristics of ferrite rod antennas allow the

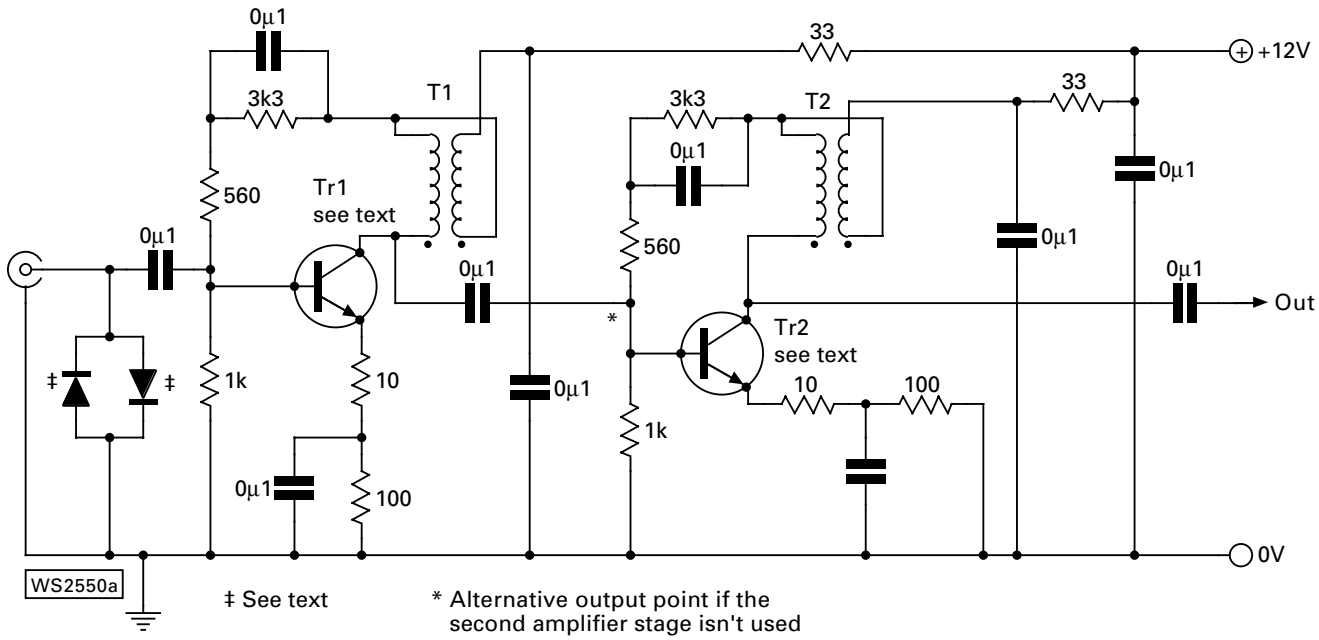


Fig. 2: The two stage low noise r.f. amplifier using a couple of BSX20 transistors which are low noise high speed devices. The nine capacitors are all disc ceramic types.

maximum pick-up of the electromagnetic components of the incoming waves at right angles to the long axis of the rods and have deep nulls off their ends.

The actual physical nulls that the antenna exhibits, will only be deep when good electrostatic shielding of the loop antenna is provided. Also the better that the tuned circuit is balanced the better the nulls produced. The antenna is simple as **Fig. 1** shows the circuit of my ferrite rod antenna.

Rod Lengthened

The efficiency of a ferrite rod loop antenna increases when the rod itself is lengthened and/or if the rod's diameter is increased. I dislike throwing out items that look as if they might be useful and I have long hoarded the rods from 'dead' or ancient broadcast receivers. I soon found four 9mm diameter rods each of 178mm (7in) length.

Remember, to improve the null - lengthen the rod. So, by using an epoxy cement I fabricated a 356mm (14in) rod having two sections side-by-side. These two rods were bound together in several places with masking tape which was applied at various points along the 'bar'. I also placed a wider section in the centre of this new composite rod.

In the junk box I found a dual-gang 250+250pF variable capacitor, which could nicely tune a 60µH inductance across the 1.8MHz band. My trusty inductance meter came into action at this stage and I soon had my 60µH coil by close winding 19 turns of 0.92mm (20s.w.g.) enamelled wire over the exact centre of the rod assembly.

A two turn link winding made from thin pvc insulated wire, was wound over the centre of the main coil. To create a secure electrostatic screening, an aluminium trough was constructed. This trough was made from two 460mm (18in) lengths of 1.5in aluminium angle stock. My local supplier did not have any metric size angle stock so, I guess it might have been in his shop for some considerable time.

Please note though, that any such electrostatic or 'Faraday' shield must have an open slot along its length. Any attempts to create a complete screen by joining the alloy into a tube, would create a single-turn secondary coil that will render the tuned circuit useless.

The ferrite rods with its coils were attached to the 'U' channel base on small wooden blocks and fixed in place with nylon cable ties. No wire or other metal components must be used to hold the rods in place or a radio frequency 'short circuit' may occur. And similarly, as in the case with the Faraday screen, the tuned circuit will be rendered inoperative.

A coaxial output socket was mounted on the wall of the screening channel, close to the antenna's secondary winding and the variable capacitor (C1A and C1B in Fig. 1) was positioned in an aluminium box beneath the coil with well insulated connections coming through the holes beneath the coil.

Careful screening of the rod and the tuning capacitor will ensure good antenna directional nulls. Why the alloy box, you may ask? Well, a capacitor 'in the open' will almost certainly have electrostatic signal pick up! The overall effect is shown in the heading picture.

Initial tests on the completed antenna, can be made by connecting it to a receiver tuned to a strong signal on the 1.8MHz band and adjusting C1A/C1B for its maximum strength.

Then if the antenna is rotated, you'll be able to make a check of its ability to null out local QRM. Turning the antenna to present its null on the received strong signal should also show that the null is effective.

Fig. 3: John holding the finished antenna, giving you an idea of its size. The variable capacitor is the aluminium, box below the 'U' shaped trough.

Amplification Needed

For the reception of average or weaker signals, some amplification of the signal directly from the ferrite rod antenna is needed. In **Fig. 2** I've shown a very useful circuit, designed originally by **Wes Hayward W7ZOI**, that I've used with earlier loop antennas. The amplifier, as shown, can give up to 40dB of gain. In many cases, just half of it may be effective as each stage gives at least 15dB gain.

The point marked 'X' in Fig. 2, is where, via a capacitor, the single stage output can be taken. In his original project, W7ZOI used type 2N5179 transistors, devices that I couldn't locate in the UK. So, instead I employed a pair of BSX20 type semiconductors. The amplifier is quite stable as there's plenty of negative (or degenerative) feedback in both the emitter and base circuits. To further help amplifier stability, ceramic disc capacitors should be used throughout.

The amplifier has both input and output impedances of 50Ω matching into most coaxial cable feeders quite well. To protect the input of the first amplifier, across the coaxial input I put a pair of back-to-back silicon diodes. When transmitting on the main station antenna there can be considerable r.f. energy coupled into the ferrite rod antenna which, if it reached the BSX20s, would do them little good.

When you come to make up your own amplifier, single or dual stage type, I would suggest that double sided circuit board be used in the construction and that you mount the completed amplifier in a metal box. This amplifier is wide band and the 4:1 toroidal transformers T1 and T2 (Fig. 2) each have 12 bifilliar turns of 24s.w.g. enamelled wire wound on Amidon FT-50-61 toroidal cores.

If you're unsure how to create a bifilliar windings, well I can assure you that it's quite easy! First take the two separate lengths of the enamelled copper wire and put them side-by-side. Then holding one of the end-pairs still, (in a vice perhaps), with slight tension along the wires, slowly twist them together, to end up with about one turn per 7-10mm length. Then slightly stretch-tension the wires, which will 'set' the twists in place.

The windings are created with this dual conductor, treating it for winding purposes, as if it were a single wire. After the winding is completed, separate and identify the ends of the wires again. The end of one winding, is connected to the start of the second winding. This becomes the centre, or feedback point of the transformer.

The completed antenna, as shown being held by John himself in **Fig. 3**, may be positioned in the roof space or an upstairs room, away from the domestic electric wiring, washing machines and other items, that may have electromagnetic fields. If enclosed in a completely waterproof box, the antenna may then be positioned outside, away from electrical fields.

PW

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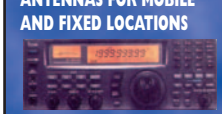

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4 MILES FROM BOURNEMOUTH INTERNATIONAL AIRPORT ON B3073
300 YARDS FROM CHRISTCHURCH RAILWAY STATION. FORECOURT PARKING FOR DISABLED

Everyone knows of the saying that "A camel is a horse designed by a committee"- however, there are time when 'many heads are better than one'. Richard Brett-Knowles G3AAT proved it to himself when he joined forces with members of the Horndean & District Amateur Radio Club in Hampshire, to discuss the various ways of providing efficient protection to a high current power supply. Read on to learn what they discovered and what they recommended.

High Current Protection For 13.8V Power Supply Units

Richard Brett-Knowles G3AAT, with the help of friends at the Horndean & District Club looks at the often neglected - but supremely important - protection circuits used in high current power supplies.

Firstly, I must acknowledge the help of fellow members of the **Horndean & District Amateur Radio Club - G4FBS** – for the assistance in preparing this article. We learned much, and enjoyed the process!

A linear high current power supply unit (p.s.u.) needs protection against inrush current on switching on, over voltage protection due to a malfunction, over current protection due to excessive load and over-heating protection of the heat sink. This may seem a long list, but I'll deal with the first two together as it's convenient to combine the functions.

Switch & Over Voltage Protection

Many circuits use a current limiting resistor in series with the transformer primary, with a relay operated by the rectified output to short out this resistor. The proposal our club looked at is no different in principle, but uses the type of dual thermistor found in the de-gaussing circuits of television sets as part of the current limiting resistor.

The de-gaussing thermistor is in two parts; a low and a high resistance, see **Fig. 1**. You'll see that the low resistance part is used in conjunction with R1 to

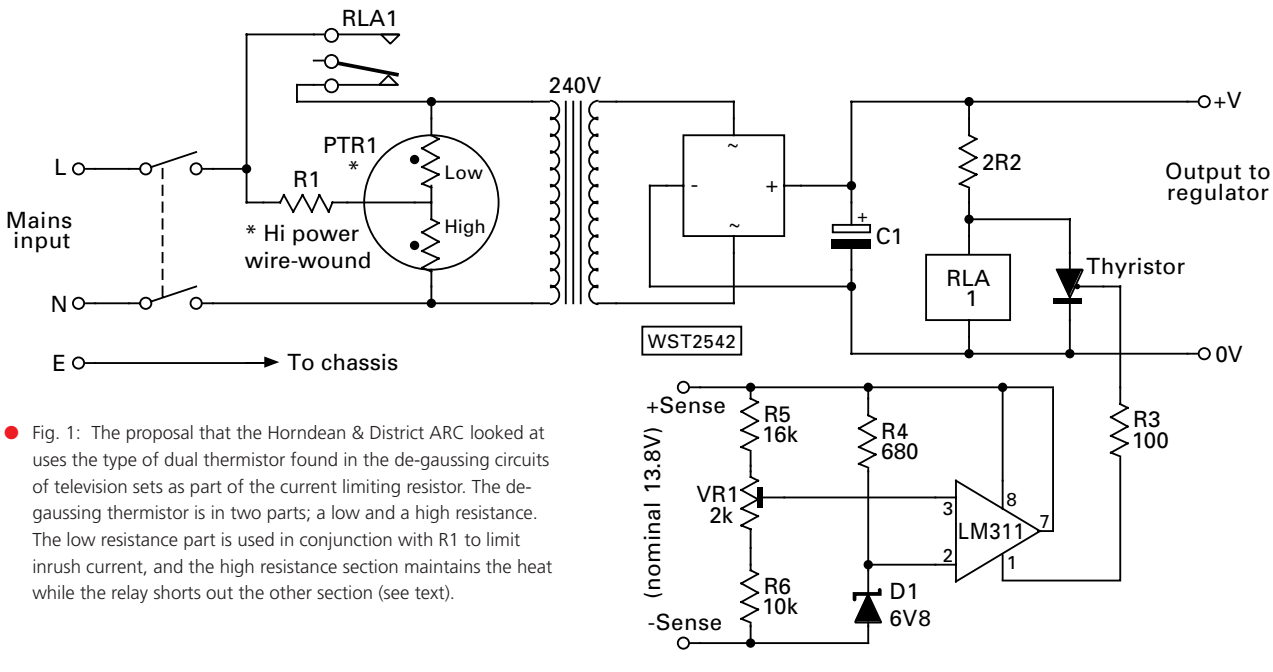
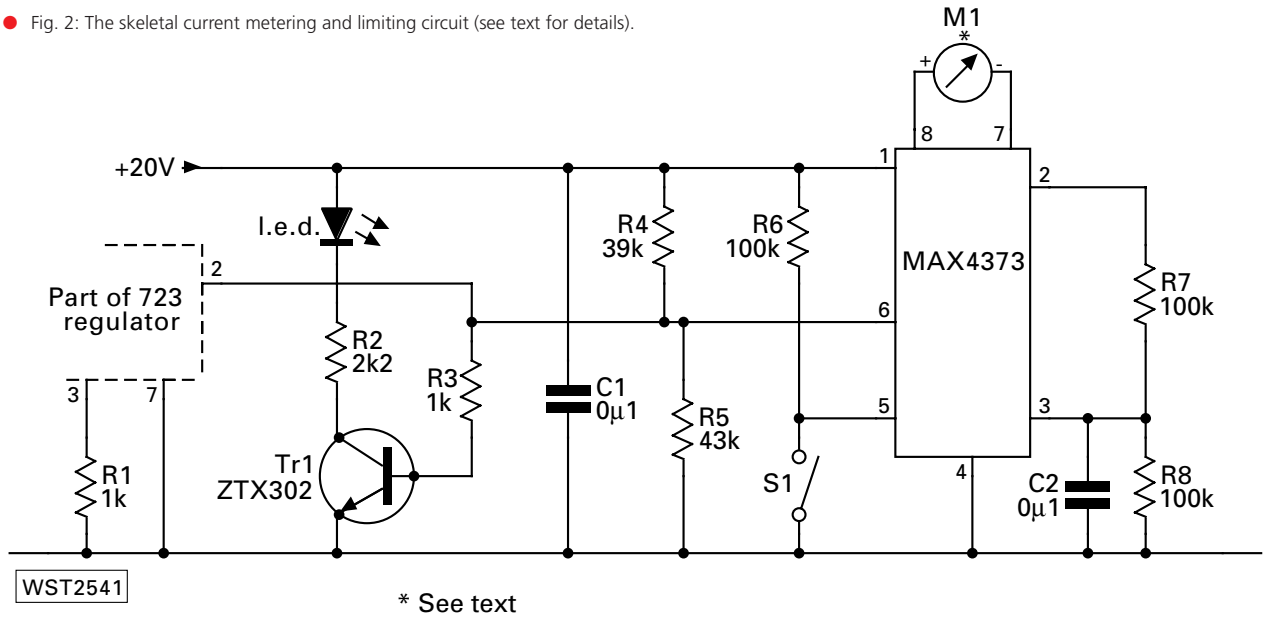


Fig. 1: The proposal that the Horndean & District ARC looked at uses the type of dual thermistor found in the de-gaussing circuits of television sets as part of the current limiting resistor. The de-gaussing thermistor is in two parts; a low and a high resistance. The low resistance part is used in conjunction with R1 to limit inrush current, and the high resistance section maintains the heat while the relay shorts out the other section (see text).

Fig. 2: The skeletal current metering and limiting circuit (see text for details).



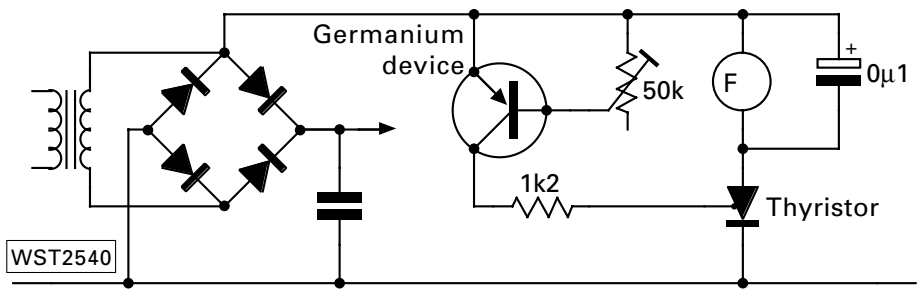


Fig. 3: The transistor, a germanium type, used as a temperature sensing device turning on the fan ('F') via the thyristor (see text).

limit inrush current, and the high resistance part maintains the heat while the relay shorts out the other part.

The relay is so chosen that it will operate when the voltage across the reservoir capacitor C1 reaches a suitable value. (A 24V relay is a good choice for a 13.8V p.s.u.).

The MC3423 integrated circuit (i.c.) was a suitable over voltage detector, but unfortunately it's now obsolete. However the 311 comparator in the ground referenced mode may be used instead.

Apart from the unusual mode, the circuit is standard. In this mode the output is taken from pin 1 and pin 7 goes to the supply. The thyristor we used required a 100Ω resistor, R3, to limit the trigger current.

When the thyristor triggers, the relay is short circuited by the thyristor itself, and the reservoir capacitor is discharged by the 2.2Ω resistor R2. The contact A1 opens, but the thermistor is still hot and the low resistance part will not allow enough current to build enough voltage across C1 to operate the relay.

The only way to reset the circuit is to switch off and wait for the thermistors to cool. **Note:** Over voltage denotes a malfunction of the regulator and this should be investigated before attempting to use the p.s.u. **Warning note:** Designs published elsewhere allow instant reset by pressing a button, which we think is inviting disaster!

Over Current Protection

The p.s.u. design will probably use the 723 controller, and the protection to be described is applicable to this i.c. The 723 actually has a current limiting circuit built-in, but it requires 0.6V to operate it, and 30A at 0.6V is 18W.

The manufacturers Maxim make a high side current sensor i.c., the MAX 4373, **Fig. 2**, which can sense millivolts, and we used the MAX 4373TESA to sense the voltage across the current meter. We also used BUZ11 m.o.s.f.e.t.s as the pass element to give a low drop out voltage, but had a separate low power supply to operate the 723, and provide the necessary gate voltage.

There are m.o.s.f.e.t.s, which need a much lower gate turn on voltage than the BUZ11, but we didn't have any. Our current meter dropped 50mV at 20A, if you have a different meter, alteration of R6 and R7, Fig. 2, can allow for it.

The comparator in the i.c. turns on at 600mV, and the fixed internal gain for the TESA version is 20. When turned on, the comparator stays latched, and is reset by earthing pin 5.

Since over current is due to load and not p.s.u. malfunction, it's reasonable to allow quick reset. Pin 6 of the MAX 4373 is pulled high by R4 when the comparator is turned on and the light emitting diode (l.e.d.) indicates this. Pin 6 of the i.c. also turns on the current limit transistor in the 723, which then turns off the m.o.s.f.e.t.s. **Note:** This transistor, in the 723, must have an emitter resistor as shown and cannot stand the current if driven in the same way as Tr1.

Incidentally, while looking at safety tips, R5, 43kΩ, prevents the comparator output on pin 6 from rising above its absolute maximum of 15V, should Q1 and the 723 be disconnected for any reason. A bonus provided by using m.o.s.f.e.t.s as the pass element is that they contain an internal reverse diode. If the load has considerable capacity, it can discharge through this diode, an external diode is not needed.

Heat-Sink Too Hot?

Next, we considered heat-sinks which get too hot. Bi-metallic thermal switches are available to switch on a cooling fan to help here when required, but we had another idea.

Remembering that the collector leakage current of a germanium transistor is

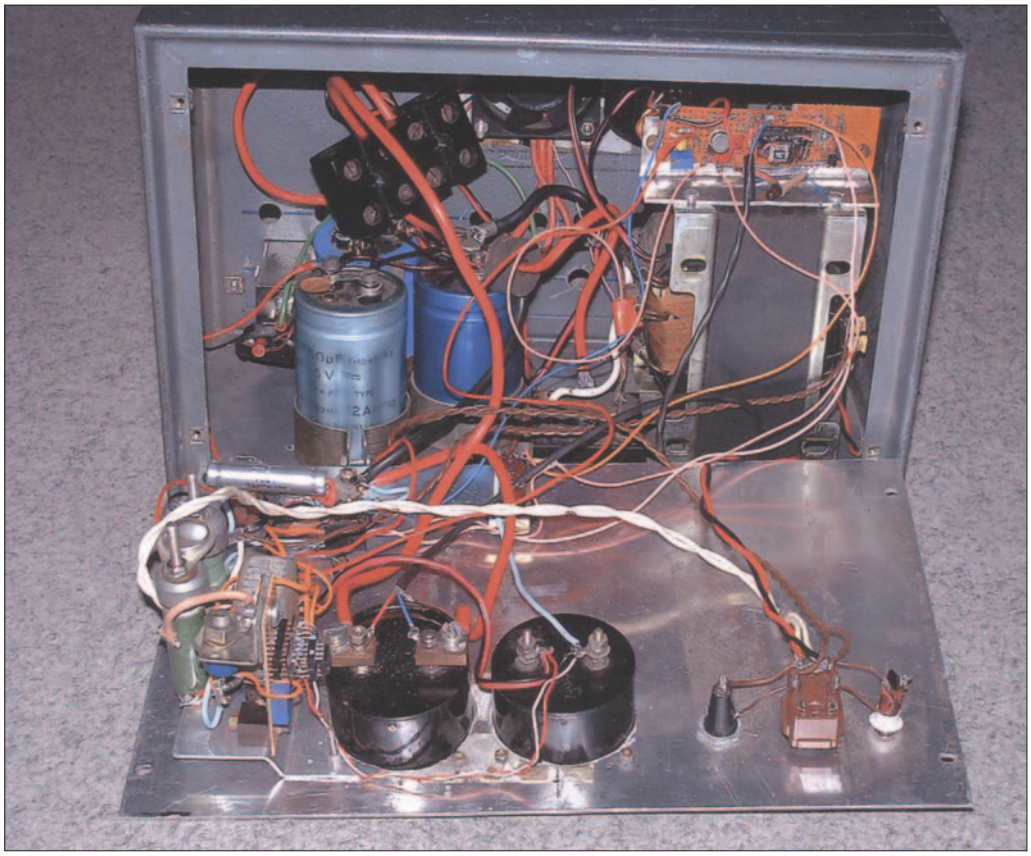


Fig. 4: Inside the prototype high current p.s.u. All thick leads carry the high current to minimise voltage drops.

contact with the m.o.s.f.e.t.'s heat-sink. The circuit has been tested by heating the transistor with a soldering iron; so far the heat-sink hasn't become hot enough to require the fan, but if the sun were to shine on it, cooling would be needed.

Switch Mode Supplies

If you are bold enough to build a switch mode p.s.u., the same protection methods can be used, with appropriate component and circuit changes. Remember that the reservoir capacitor will be charged to rectified mains voltage and you'll have to allow for this in the design.

Finally, my thanks to everyone at the Horndean & District Amateur Radio Club for their support. If you're in the area you'll be most welcome to join them. Please contact the Secretary, **Stuart Swain G0FYX** at **15 Mavis Crescent, Havant, Hampshire PO9 2AE.** PW

Fig. 5: The heat-sink and ventilation holes are visible in this view of the rear panel of the project (see text).

considerable and temperature sensitive…especially if the base is left open circuit. If the base is returned to the emitter through a variable resistor, the leakage current can be used to trigger a thyristor, and be controlled (**Fig. 3**. shows our circuit).

The fan (shown marked as 'F') is a 12V type, but the low power auxiliary supply provides 20V. The fan and transistor are connected between the negative of the bridge rectifier and one side of the transformer winding. This allows a thyristor to control the fan as its supply drops to zero for a part of each cycle.

Note: The transistor is in thermal **but not electrical**

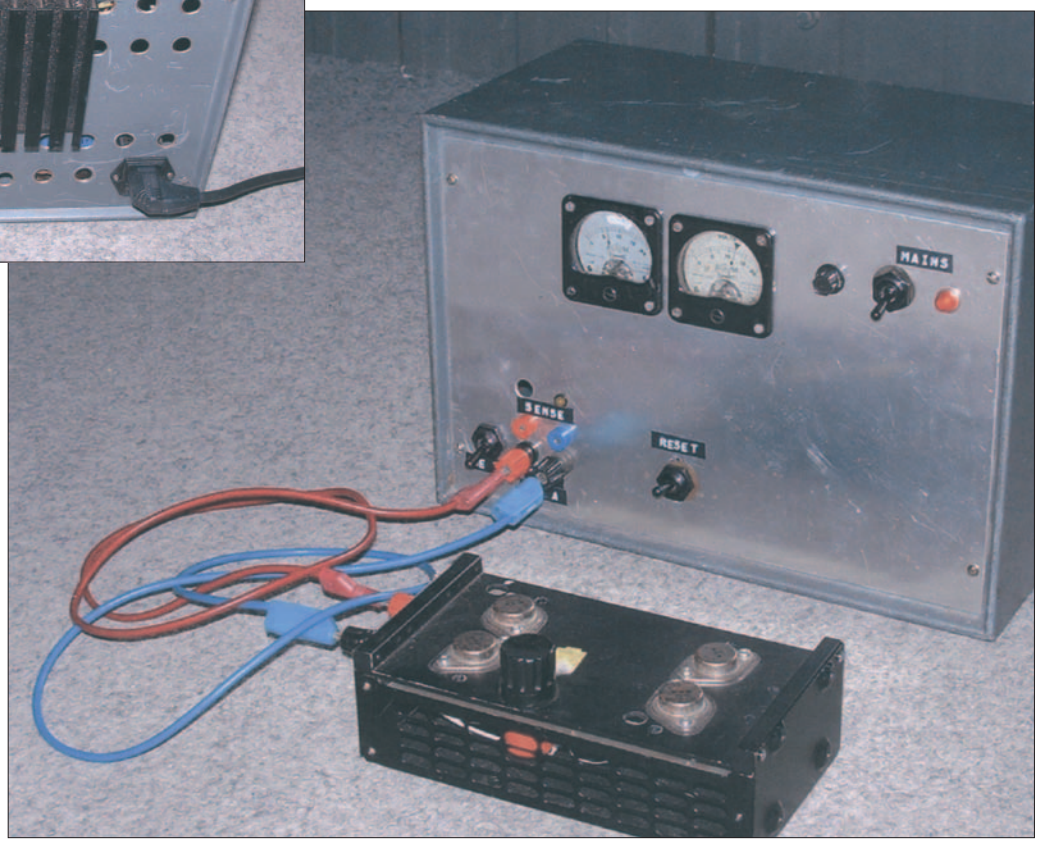


Fig. 6: Testing the prototype high current p.s.u. using an electronic loading 'resistor' consisting of four power transistors.

valve & vintage

Ben Nock G4BXD laments the passing of the main rally season but celebrates new additions to his growing collection. Of course, he's a real valve fan, but a transistorised Eddystone receiver has now found its way to Kidderminster!

As I write this column the year is drawing to a cold and dark conclusion as the last rallies of the season are upon us. The 'big one' at Llandudno will probably be it for me this year as far as I'm concerned.

Despite the weather it's been a good year for me because in June I enjoyed an excellent day with a trip to Normandy for the D-Day celebrations. I even managed to bring back a Second World War French military field telephone for my collection.

By the time this reaches you dear reader - I should have attended the 60th Commemorations at Arnhem in Holland. I'm also planning to attended the Leicester rally where, hopefully, I'll have found a few more goodies for future editions.

● Fig. 1: The Eddystone 960 transistorised receiver, complete with large easy-to-read tuning scale (see text).

Eddystone Arrivals

Recent new arrivals to my collection include the Eddystone 960, which I mentioned last time and yet a further Eddystone set, the 740 receiver. There has also been the arrival of a 670C, but more on that at a later date.

First thoughts about the 960 were that it would be a lightweight, after all, it is a transistorised receiver. Not so, it's just as heavy as the other sets of similar style! Based on the 940 valved set, the 960 was Eddystone's first transistorised receiver.

Many people think the more famous EC-10 was their first transistorised model but the 960 came out around 1961. The EC-10 actually appeared in 1963, according to information from various Eddystone User Group magazines.

The 960 uses 19 transistors, of the OC171, AF112 types. It covers 500kHz to 30MHz in six bands, uses a 465kHz intermediate frequency (i.f.) and has a beat frequency oscillator (b.f.o.) for c.w./s.s.b., a noise limiter and a crystal filter.

● Fig. 4: The American made T-13A v.h.f. transmitter. A 28V heater and relay supply is required (see text).

The Eddystone 740 receiver, which I've previously mentioned, was housed in the earlier A style case as opposed to the C style for the 960. The 740 is an eight valved superhet using an 450kHz i.f., tuning from 480kHz to 30MHz in four ranges. Produced between 1950 and 1954 the receiver is also provided with a b.f.o. though for c.w. or s.s.b. reception.

While the 960 transistorised receiver has the convenience of battery operation, with less heat, waste of energy (very 'green', etc.) it has to be said the 'warm glow' of the valved set, with that special smell of melting wax and bubbling carbon resistors wins every time for me! I would much rather sit in front of a valved set and soak in the atmosphere of such equipment at any time.

It's worth mentioning that the actual performance of the 960 is actually quite basic, verging on the poor in my opinion. Obviously the ancient transistors are well past their best and it would indeed be interesting to replace the devices with modern versions, but then that's the collectors dilemma isn't it?

Do you leave the set as original even if working poorly, or do you modify it for use in today's world? Maybe if I find a second 960 I can consider that option.

Heathkit HW-30

One of the first sets I remember having, and one that gave me hours of fun on the air, was the little Heathkit HW-30 otherwise known as the Twoer'. The set employs a tuneable 144MHz super-regenerative receiver with a single channel crystal controlled transmitter.

The crystal - 'rock bound' as we used to say - operation on transmit was not as limiting as it sounds. Back then, 1968-9, there was little in the way of today's obsession with channelisation.

Operators in the south of

Fig. 2: The S740 receiver. Ben G4BXD says "its older classic style still looks great today" (see text).

the country producing signals down in the bottom of the 144MHz band. Those in the north used crystals in the upper part of the band and we here in the Midlands had crystals operating around the middle of the band.

When I called "CQ" I stated during the call that I would be "tuning the band" either "low to high" on my receiver, if the beam was pointing south, or "high to low" if I were pointing it north. Those in the north tuned low to high, those in the south tuned high to low.

In practice it worked and many contacts covering distances, often far exceeding those today, were achieved on some really primitive equipment. Today, we all listen on S20 with a small whip antenna and I think that nobody hears or works further than the end of the street. Anyway, I digress!

The HW-30 was a great little set, and I spent many hours operating with it. In fact, I can recall easily working into London, Isle of Man, Scotland, etc., with its 5W of amplitude modulation (a.m.) signal. The receiver - being a super-regenerative type - worked best on a.m. which was all there was in those days as narrow band frequency modulation was only just beginning to be popular.

Spotting an HW-30 at a rally this year I jumped at the chance of buying it....and well pleased I was too! The model I bought must be the version produced for the American home market as the receiver tunes from 144 to 148MHz and the power supply is 115V a.c.

I seem to recall that my original set tuned 144-146MHz and I know I didn't use a step down transformer for its operation on 240V a.c. mains. Incidentally, I was pleased to find the set actually worked, after the obligatory repair, and even came with a crystal on 145.325MHz. So if anyone fancies a 144MHz contact, let me know* **(See note below)**.

Fig. 3: Ben G4BXD says he's pleased at buying "The great little Two metre" transceiver, the HW-30 or "Twoer", which was produced by Heathkit (see text).

American Aircraft Transmitter

Another recent import for my collection came from a friend in the USA in the form of a small v.h.f. transmitter, the ARC T-13, designed for aircraft use. The Aircraft Radio Corporation (ARC), of Boonton, New Jersey, USA, arose in the 1930s as a supplier of goods and services to the early commercial airlines.

Around 1940, ARC began to manufacture receivers nearly identical with the SCR-274N Series made by Western Electric Co. When the AN- designations appeared circa 1943, SCR-274N became AN/ARC-5, with BC- designated equipment given R- (receiver), T- (transmitter), C- (control), MD- (modulator) and so on.

So, you may find both AN/ARC-12 and ARC. ARC 12 units. But they are not at all alike; the ARC Type 12 is a set of receivers and transmitters covering 200kHz to 1.5MHz and 118-148MHz, while AN/ARC-12 has a 225-400MHz coverage.

Fig. 5: Inside the T-13. Four 5763 valves are used and the unit still has its 142MHz crystals fitted (see text).

The specification for the T-13 or T-364/ARC transmitter is 132-148MHz frequency coverage, with an output of 2W a.m. r.f. output. It uses four 5763 valves, and provides five channels in any 2MHz segment and was powered from a 28V d.c. at 1.5A using an external vibrator power supply. Once I get the circuit diagram I shall try and get it going on 144MHz, maybe it could then talk to the HW-30?

I think it's a shame that a.m. has fallen by the wayside on 144MHz. Many older sets, and many milita vintage and just later, would work on 2 with ease, the SCR-522 for example, all crystal controlled so stability would not be a problem, I guess its just whether the modulation might give rise to interference in this day and age that's the problem. **PW**

And Finally

Well that's all for now, although of course I'm looking forward to meeting one or two of you at the various final rallies this year. As always, you can write to me at; **62 Cobden Street, Kidderminster, Worcestshire DY11 6RP**, or via my new E-mail at **military1944@aol.com** (My web pages are still at **www.qsl.net/g4bxd**).
Cheerio for now.

***Editorial note:** Readers who enjoy getting the most out of simple v.h.f. equipment will no doubt be interested to learn that a series of v.h.f. 'classic' circuits are due to be published in 2005. These will include a.m. transmitter and receiver designs for both 70 and 144MHz - similar to Ben's favourite 'Twoer' - to encourage more constructors to enjoy this mode on v.h.f. Remember those really high quality a.m. signals on 'Two'? You could be one of them, so hang on to those crystals!*
***G3XFD**.*

VHF DXER

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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

DAVID G4ASR REPORTS THAT PROPAGATION CHANGES ARE OCCURRING ON THE VHF BANDS

Predictably the month of August heralded the seasonal change in propagation that always occurs on the v.h.f. bands. Most noticeable was the reduction in intensity of Sporadic-E (Sp-E) openings particularly on the 50 and 70MHz bands. Nevertheless Six Metre openings occurred on most days during the month although most were rather weak and of short duration. A handful reached the 70MHz band and on one occasion, admittedly right at the beginning of the month, the maximum usable frequency (m.u.f.) reached the 144MHz band.

Geomagnetic conditions during August were reasonably quiet with only one small auroral opening being reported on the 50, 70 and 144MHz bands. Very little long-distance tropospheric propagation was noted on any of the v.h.f. and u.h.f. bands although well sited stations did report contacts up to 1000km away on the 144MHz band. However, the big news of the month though concerned the *Perseids* meteor shower with contacts being made on all v.h.f. bands and more significantly on the 430MHz band. (A meteor scatter contact on this band is very difficult to achieve and requires much dedication by the participating stations).

THE 50MHz BAND

Although Sp-E openings occurred on most days during August most were rather weak and of short duration. This was not unexpected as August normally marks the end of the summer Sp-E season. Nevertheless there was some good DX to be worked mainly during the first two weeks of the month.

Some of the stations worked from the UK included CN8KD (Morocco), EH9IB (Ceuta), OD5XX (Lebanon), OHO/SM0JHF (Aland Islands), SV1DPI (Greece), TF8GX and TF9OX (Iceland), ZA/IK0OKY (Albania), 4Z5PT (Israel), 5B4AFH (Cyprus) and 7X2RO (Algeria).

Transatlantic openings were reported on 2, 4, 6 and 7 August with reception of the Newfoundland beacon station VO1ZA (50.039MHz). The only day that two-way contacts were reported was on 6 August with the c.w. stations of K1GUN and K1TOL being worked around 1745UTC by stations in southeast England.

Brian Carter G8ADD reports that on 27 July he noticed an auroral opening on the 50MHz band. One of the stations he heard was F6HRP (France) who came back to Brian's call at the second attempt. Nothing remarkable about this except that Brian was only running 5W into 20m long wire antenna. The design by GW0GHF (from the UK Six Metre Group website) has performed very well with over 36 countries being worked in one year on low power. All it takes is a little perseverance!

Adrian Ball G8PSF (Greater London IO91) also runs low power with 15W into a Moxon loop antenna. Many stations up to 2000km away were contacted during the summer with nearly 20 countries worked in a four-week period. Recent s.s.b. contacts included the stations of EH6SA (Balearic Islands), ES4UQ (Estonia), UR4UC (Ukraine), LA8WF (Norway), OH3MF (Finland), OY9JD (Faroe Islands) and 7X0AD (Algeria).

THE 70MHz BAND

It's been a busy period on the 70MHz band with two major contests (National Field Day in July and the RSGB Trophy event in August), a number of Sp-E openings, the *Perseids* meteor shower, a small auroral opening and the regular Tuesday night activity periods. Contests are always an excellent time to 'pick-up' new squares, especially on 70MHz.

Activity was quite good on 4 July during the v.h.f. field-day contest, although most stations reported that band conditions were flat with no Sp-E propagation to liven up activity. The station of GM3HAM/P (160W and an 11-element Yagi) did very well making 78 QSOs with the best DX being G3GRS/P at 538km.

Down in Cornwall the Newquay & District Radio Club G4ADV/P found band conditions challenging especially as the station was only running 25W into a 6-element Yagi. A total of 23 contacts were made with best DX being GM3HAM/P (IO74) at 504km.

Operating from the south coast in Dorset the Flight Refuelling Amateur Radio Society G4RFR/P made 79 QSOs. They were running 160W into a pair of 12-element Yagis and report that GM3TAL/P was their best DX at 591km. Another Scottish station MM0CPS ran 60W into an 8-element DL6WU Yagi.

They made 38 contacts with G4RFR/P being the longest distance at 561km. Other stations active during the contest included GC3SRT/P (70W and a 4-element Yagi), GI3PDN/P, GM0USI/P, EI3IO and EI7M/P. **Geoff GW3LEW** (IO71) came on the band for the first time during n.f.d. and managed to work stations in five countries and eight locator squares. He is currently running 70W into a 3-element Yagi at only 3m above ground.

Conditions during the RSGB 70MHz Trophy contest on 22 August were very similar to v.h.f. field day with no Sp-E openings and generally flat tropo conditions. A few stations did manage however to make single burst QSOs via meteor scatter with OY9JD on the Faroe Islands. He was operating on s.s.b. on 70.110MHz.

The station of GD0TEP/P running 160W into a pair of stacked 8-element Yagis reports that the antenna rotator had a mind of its own and was beaming wherever it wanted! Even so a total of 103 contacts were made which is a high score for this band. His best DX was an s.s.b. contact with G1EHF/P at 500km.

The station of G1EHF/P (Kent JO01) mentions that he was trying out a new portable site near Folkestone. Running 160W into a 6-element Yagi a total of 62 QSOs were completed with his best DX being with GM4SIV/P (IO75) at 652km.

The portable station GW3TCU/P (IO83) reports making 120 contacts from a site in North Wales. Running 150W into a large array of four 6-element Yagis he contacted the station of GM4VVX/P (IO78) for his best DX at 564km. It wasn't easy going for all stations though.

Stewart Cooper GM4AFF (Montrose IO86) reports that conditions made it very hard going. He could hear many stations, but they couldn't hear him. Running 70W into an 8-element Yagi Stewart contacted 10 stations, the furthest away being G4ZAP/P (IO80) at 688km. The station of M5HDF/P reports that this was the first time he had entered the 70MHz Trophy contest.

Although only operating for less than three hours he had a good time with some nice contacts being made. Running only 5W into a

4-element Yagi he clocked up 23 s.s.b. contacts, which included the station of GI4GTY/P at 323km. Also running low power was the station of M5ADF (IO91) who reported making contacts all around the UK. Running 25W into a 6-element Yagi a total of 35 contacts were made with the best DX being GM4SIV/P on the Mull of Kyntyre at 543km.

Predictably outside of any contest period the propagation conditions significantly improved! Sporadic-E propagation was reported on a few days during the month, the best openings occurring on 2 and 25 August. There were other days when the m.u.f. reached up as high as the 70MHz band, but openings were restricted to areas of Europe that don't have authorisation to use the band.

Stations known to have made two-way contacts into the UK included S51DI, S57LM and 9A2SB. The beacon stations of OY6BEC (70.035MHz), OZ7IGY (70.021MHz), S55ZMB (70.027MHz) and 5B4CY (70.113MHz) were also heard during these openings.

Martin Andrew GM6VXB (Aberdeenshire IO97) reports that he is active on all bands from 50MHz through to 1.3GHz. As he is the only station in locator square IO97 operational on the 70MHz band he is very much in demand. His QTH is situated only 50m from the coast with a take-off from East through North to West over the North Sea. It's superb for aurora propagation as Martin mentions that he can hear v.h.f. beacons going auroral hours before anyone else notices.

On the 70MHz band Martin uses a Yaesu FT-847 transceiver driving a BNOS 100W amplifier into a 6-element Sandpiper Yagi as shown in the photograph, **Fig. 1**. Martin reports that during the summer Sp-E season he made s.s.b. contacts with the stations of S51DI, S59MA and 9A3AB.

Outside of main shower periods there's normally very little meteor scatter activity on the 70MHz band. The *Perseids* meteor shower that peaked on 12 August however did help to focus a few stations onto the mode. European stations known to be active at this time included OZ3ZW who was operating around 70.100MHz and S51DI and 9A6R who were operating around 70.200MHz. The reason for this split in activity centres is because of the different frequencies bands that have been granted in these countries.

● Fig. 1: The v.h.f./u.h.f. antennas at the QTH of Martin Andrew GM6VXB.

On 30 August between 1500-1800UTC there was a small auroral opening with a number of UK stations active on the 70MHz band. They included GD0TEP (IO74), MM0BSM (IO86) running 10W to a dipole antenna, GM4ISM (IO85), GM4VVX (IO78), GM4WJA (IO87), GW8ASD (IO83), G3UVR (IO83), G4ASR (IO81), G4DEZ (JO03), G4FUF (JO01) and G4RGK (IO91).

Informal activity periods held on a Tuesday evening are proving quite popular with stations using c.w., f.m. and s.s.b. Ron Price GW4EVX operated from a local high point near Flint (IO83) from 1900UTC on 27 July. He was using a Yaesu FT-817 transceiver driving a transverter running 25W into a 5/8 wave vertical antenna on the roof of the car. He reports that it was well worth the effort as in less than two hours he had made f.m. contacts with the stations of G3TSA, G4TQH, GI4VIV, G8CXR, M0PJX, M3THZ, M3WLP, 2E0UXB/M, 2E0VIV, 2E0VOM and 2E1EER.

THE 144MHz BAND

Sporadic-E, aurora, meteor scatter and tropospheric propagation were all noted on the 144MHz band during August. What was probably the last 144MHz Sp-E opening this year occurred between 0925-0955UTC on 1 August with stations in southern England making s.s.b. contacts with SV2JL (KN10) and SV3CYM (KM08). **Tim Fern G4LOH** (Cornwall IO70) reports that he contacted SV2JL (Greece) at 0952UTC for a new country at 2427km.

A mild solar wind stream flowing from a coronal hole on the Sun sparked an aurora on 30 August. Although it was a fairly weak affair it lasted for over five hours with stations making many inter-UK contacts on both c.w. and s.s.b. Some reasonable DX was to be found on c.w. and included the stations of G0KZG/MM (IO99), OH6QU (Finland), OZ2M, OZ8FR (Denmark), SP2IQW, SP3MGM (Poland) and YL3AG (Latvia),

Every year the Earth encounters the *Perseids* meteor shower. It lasts for about four weeks with maximum activity this year occurring on 12 August. During the peak of the shower I prefer to be active in s.s.b. as quick single burst 144MHz contacts can often be made. On 12 August between 0730-1030UTC I operated on and around 144.200MHz and made contacts with the stations of IW2HAJ (JN45) at 1130km, LA0BY (JO59) 1225km, LA8KV (JP52) 1460km, OH1XT (KP01) 1817km, OH5LK (KP30) my best DX during the shower at 2066km and SM2CKR (KP03) at 1880km.

Most meteor scatter activity is to be found on the 144MHz band with somewhat less activity on the 70 and 50MHz bands. It's very difficult to make m.s. contacts on the 430MHz band but this is exactly what **Chris Bartrum GW4DGU** accomplished. He reports high-speed c.w. contacts with the stations of OK1DFC (Czech Republic) and SM3AKW (Sweden) during the peak of the *Perseids* meteor shower. Congratulations Chris!

DEADLINES

That's it again for another month. Good luck with your DX contacts and please let me know what you managed to work during the autumn tropo period. Send your reports or news, preferably by E-mail, to reach me by the last weekend of the month.

73 David G4ASR

HF HIGHLIGHTS

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

I begin this month with some information from regular *PW* contributor **Colin Topping GM6HGW/ZD9HGW** who is a member of the **British Railways Amateur Radio Society**. Colin said "The Society was formed in 1966 by a few railwaymen with a common interest in Amateur Radio and has continued to grow with the current membership level standing at just over 100 members. They are also part of a much larger organisation called the **Federation International Radio Amateur Cheminot** (FIRAC), which was founded in Hamburg in 1964 and currently has 2500 members world-wide in 23 countries. The aim of both organisations is to promote friendship amongst people who share a common interest in both railways and Amateur Radio.

The Society produces a quarterly newsletter to keep members informed of forthcoming activities in both the BRARS and FIRAC. The Society try to run Special Event Stations from railway sites all over the country whenever possible, but like most groups these days is subject to member's available free time and the co-operation of railways in general. The Society charges a small subscription to cover costs (currently set at £5.50) with a £1 reduction for retired staff. New members joining from September onwards receive a small bonus as they are not required to renew their membership until at least 12 months has elapsed".

For further details of the society and a list of forthcoming events look at **www.brars.org.uk/** The next planned Special Event is **GB4SCL**, which will operate on the 23 October from Ribblehead station on The Settle and Carlisle line, which was originally opened on the 4 December 1876. After years of neglect and following an extensive refurbishment that took over two years and over £200,000, the buildings at Ribblehead were formally re-opened to the public on Saturday 14 October 2000 and they are now back in regular use.

DX NEWS

Onto some DX news now and to **Pierre-Marie F6FLN/HB9DTM** who is in Bujumbura, Burundi for two months with the United Nations High Commission for Refugees (UNHCR). He has obtained the callsign **9U6PM** and will be active using s.s.b. with a Kenwood TS-450 and plans to operate c.w. when his keyer finally arrives! His activity has already been on 21/24 and 28MHz between 0800 and 1530UTC. Suggested frequencies to try are on or around 21242, 21270, 24948 and 28505kHz.

Laurent Fontaine F5MUX is returning to the Island of Martinique NA-107 for the CQWW SSB Contest on 30-31 October as a Single-Op/All-Band entry. He hopes to get his previous callsign **FM2GO** but if that is not available he will get a TO prefix. All QSLs via his homecall: **PO Box 42, 29950 Benodet Cedex, France** via the bureau or direct.

A group of French operators from the Clipperton DX Club (CDXC) including **Gerard Debelle F2VX**, **Jean-Louis Dupoirier F9DK**, **Vincent Denecker G0LMX** and **Alain Tuduri F5LMJ** will be in The Kingdom of Bhutan (A5), which is located in Southern Asia between China and India. The operation will be from 24 October to 11 November. During the first week from Thimphu they will participate in the CQWW SSB Contest and after that they will move to Jakar where they will be building a new club station. The callsign **A52??** is to be confirmed, but all QSLs go via the bureau to F9DK.

Robert Felicite 3B9FR has been very active lately on RTTY from Rodrigues Island AF-017. Listen for Robert on 14/18/21MHz between 1400-1700 and after 0230UTC on 14MHz. He has also been heard on 29.600 between 1200 and 1400UTC working into Europe on f.m. QSL direct only to **PO Box 31, Citronelle, Rodrigues Island, via Mauritius Island, Indian Ocean**.

Finally, long-time DXer **Laurie Margolis G3UML** is joining this month's operation from Lord Howe Island OC-004 organised by **William Horner VK4FW** and the Oceania DX Group. A team of Australians, Italians and Laurie were due to arrive on Lord Howe on 9 October for a well-equipped two week operation using four h.f. stations and the call **VK9L**. Laurie is the only Englishman on this DXpedition and will spend much of his time working s.s.b. on the low bands! For all the latest news check out the website **http://odxg.org/**

THERE'S A NEW REPORTER THIS MONTH, PLUS LOTS OF DX ACTIVITY FROM CARL!

BRITISH RAILWAYS AMATEUR RADIO SOCIETY

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YOUR REPORTS

Now for your reports and I begin this month with the log of new reporter **Bill Walters GW3GQN** who lives in Morriston, South Wales. Bill is a former operator in the Merchant Navy and received his first licence in 1948 and over the years he has owned and used a variety of equipment. His present station consists of a Kenwood TS-570DGE and the antenna is a custom-made G2DYM designed by **Richard Benham-Holman G2DYM**, who worked for the BBC as a transmitter and antenna (he would say 'aerial') engineer! This antenna is described as a trapped dipole which can handle up to 2kW of power and is fed with 75Ω balanced line feeder with the option of a 1:1 air-cored balun. The antenna works well for Bill who logged EC1SEM (Spain) 2008, ZA/Z35M (Albania) 2035, all on 7MHz followed by LY2PX (Lithuania), DL3RMU (Germany), SP9MRK (Poland), 4X1BD (Israel) in Jerusalem, KA1EFO in Boxford, Massachusetts, VA3EUU (Canada) in Coldwater, Ontario, PY8AWA (Brazil) in Belem, PA North of the country and CT1LFI (Portugal) between 1918 and 2130UTC on 14MHz c.w.

Also on 14MHz was keen Morse enthusiast **Ted Trowell G2HKU** on the Isle of Sheppy in Kent who has had a quiet month because of "the very high levels of static which has made the low frequency bands very unpleasant to use. This, coupled with the good weather has made the grass and hedges grow as if there is no tomorrow and therefore required my attention!". Ted's contacts on the band include ZB300FK (Gibraltar) operated by **Ernest Stagnetto ZB2FK, 74 Kingsway House, Red Sands Road, Gibraltar**. CX5BW (Uruguay), PJ2/PA0JMY (Netherland Antilles) SA-006, VP5/N2AMD (Turks & Caicos Islands) NA-002 and TF/LX9EG/M (Iceland) EU-021 between 2100 and 2144UTC using a Ten-Tec Omni V at 70W to a G5RV.

In Chelmsford **Martyn Medcalf M3VAM** was very busy 'playing radios' with the Scout Amateur fellowship at the 2004 Essex Jamboree which included a visit by the GB2FUN mobile shack run by the RSGB. His s.s.b. logbook lists F4ECJ (France) 1445, CQ14AUO (Portugal) 1643, UE4LKW (European Russia) 1934, SV3EXU (Greece)

1936, S504BAL (Slovenia) 1937, HG56VEK (Hungary) 2005 and LY2FY (Lithuania) 2231UTC using a Icom IC-746 and SGC-237 auto tuner connected to 8.2m of wire. Operating from the Lizard Lighthouse in Cornwall was **Chris Colclough G1VDP** who says "the trip to the Lizard wasn't that fruitful. The band conditions were really atrocious, but can I through your column say a big thank you to all the stations who answered my CQ calls. All the QSL cards have been sent through the bureau apart for the ones who sent direct with s.a.s.e.s (and again a big thank you to those), hopefully stations should start to receive them shortly".

Some of the stations to make Chris's s.s.b. logbook during the afternoon included LZ1BJ/1 (Bulgaria) on Sveta Anstaysa Island EU-181, DL5MU (Germany), F2LG (France), PA3FRD (Netherlands), MM0LSB/P (Scotland) on Burna Rae Island. All contacts were made using his Budddipole antenna and 100W output.

Chris G1VDP's set-up at the Lizard Lighthouse.

THE 18 & 21MHz BANDS

On to 18MHz and operating mobile again despite 'very poor conditions' was **Mark Taylor G0LGJ** in Dereham who used his Yaesu FT-100 and a Pro-AM mobile whip to log just one s.s.b. contact with JI1TMH at 1325UTC. Meanwhile Martyn M3VAM worked CS94MD (Madeira Island) AF-014 at 1518 followed by CN8JV (Morocco) at 1635UTC.

In Dumfries **Jim Pedley GM7TUD** has been pretty busy with work and taking his annual holiday and has not had too much time for amateur radio. "Band conditions not been at their best" says Jim, "with very little heard on 24 and 28MHz though there has been some nice DX on 14MHz. Sometimes it is like a zoo here, as some stations seem to lose all rationality when DX does appear and of course the ability to recognise what call the activity is asking for! The zoo that surrounds 14195kHz everyday and where the southern Europeans hold court causes all levels of abuse to operators who dare to transmit there because of the 'DX Window'. I thought I would try to find this, but despite looking at the RSGB and the IARU band plans I failed to find the window that everyone screams about. It saddens me the way some of these stations go on and it certainly is not in the sprit of ham radio! If anyone has a radio demonstration going on it must be embarrassing to hear all the abuse with a room full of people. Some of who may have the potential to become licensed themselves".

A move to the 21MHz band enabled some more relaxed operating for Jim who worked JH3AIU (Japan) 0851 on the key followed by voice contacts with RI9KM (Asiatic Russia) 1148, OD5RMK (Lebanon) on AS-108 at 1233, YM0T (Turkey), E21EIC/P (Thailand) in the Gulf of Thailand on AS-107 at 1611, A43SI (Oman) and 7P8NK (Lesotho) at 1700UTC.

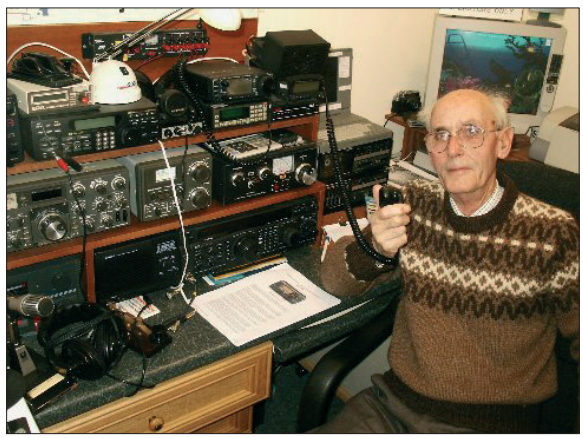
Ted G2HKU found a reasonable opening in the evening around 2110UTC as SV8/LZ1QN (Greece), EA8/OE2LCM (Canary Islands) AF-004, PZ5RA (Surinam) and S9SS (Sao Tome & Principe) AF-023 all made it into his log.

Ribblehead railway station.

SV3AQR QSL card.

THE 24 & 28MHz BANDS

The higher bands were not fruitful for our reporters this month with only Jim GM7TUD reporting any contacts. They were with OY1CT (Faroe Islands) EU-018 on 24MHz c.w. at 1012 and two 28MHz QSOs using s.s.b. with TK/F6AUS/P (Corsica) EU-164 at 1015 and ST2DX (Sudan) at 1347UTC.



New reporter Bill Walters GW3GQN who lives in Morriston, South Wales.

SIGNING OFF

That about wraps it up for yet another month and looking at the logbooks received it has been a difficult one for most of you. The bands continue to be poor for DX with our reporters spending most of their time operating on 7 & 14MHz where contacts appear to be mainly European! There are a number of holiday operations, DXpeditions and contests taking place throughout the world at the moment and there would be plenty to work if only the conditions would improve. As the winter months draw nearer I hope this will be the case. Time will tell!

As usual my thanks go to all our reporters for their logs and to **Tedd Mirgliotta KB8NW** editor of the *OPDX Bulletin* for all the DX information. Until next time, have a good DX filled month.

73, Carl GW0VSW

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

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TEX SWANN G1TEX/M3NGS TAKES HIS TURN TO 'BURST' YOU WITH DATA!

In my last column I looked at a variety of topics including finding software by using the Internet. This time I want to expand a little on that by looking at it a little closer and perhaps, doing what I should have done then and give you a grounding in what I feel you should be looking for to set your computer up.

Firstly, there's a utility that I think you should have before you try and download anything from the Internet. Many files that are stored on the 'net, are compressed in size, to reduce the overall data space that they take up. So, firstly I think that you should get hold of a utility to extract the data from these compressed files.

If you're using a Macintosh computer then there really is only one utility that I can recommend and that's *Stuffit.* Available from **www.stuffit.com**, **Fig. 1**, the *Stuffit* utility will extract the data from a variety of compressed files. On Macintosh machines, the commonest file-type is the '.sit' file. This file has been compressed with the *Stuffit* compressor. Unusually, the *Stuffit* utility is also available for both *Windows* and *Linux* operating systems, all of which may be downloaded from the website.

WINDOWS PLATFORM

A similar utility called *WinZip* is probably better known on the *Windows* platform, having existed in one form or another since the days of DOS and *Windows 3*. The utility *Winzip* is now up to version nine and is an extremely fast data extraction and compression utility that can deal with sub-directories as well as just files. You can find *Winzip* at **www.winzip.com** (**Fig. 2**) where it can be downloaded and installed.

As with many installations, if you're unsure what locations to choose - choose the default that the system offers. Anyhow, now that you've downloaded one or other of the decompress utilities, you're ready to seek some other useful software! Let me now show you how I go about it.

I've been using the Internet now for almost nine years, and it's 'grown on me'. All that time ago, I was almost limited to basic E-mail running on a low-end '286 machine as I felt that there was little need to have a faster machine for the job. Software and other files were rather more difficult to find than they are now. You really needed to know exactly where to look to find almost anything.

Move on nine years, and we now have several extremely good 'search engines' that allow us to find information very quickly. For preference I use Google, **www.google.com** which I find amazing. In spite of having a working life of over 30 years in touch with computers, I still find its ability to seek, sort and display its results staggering.

Let me just take one result as a demonstration. For the purposes of this column, I went to look for free antenna design software. So, starting the web-browser, I called up Google's website and typed in the words "antenna design software" in the search for line. My initial query didn't use the inverted commas, so Google treated it as three separate words with the emphasis on the first word and looked for all instances where one or more of those words appeared.

A MISTAKE

Using three separate words was a mistake, as Google reported (within one quarter of a second) that it had identified over a million instances (hits) where one or more of those words existed. Trawling through that list would have meant rather a lot of work to find just the ones I wanted! One way of limiting the search results is to apply double inverted commas around a phrase. That way the search engine treats the words as one 'word', rather than three instances of single words.

Nonetheless, one of the first of the results was to be found at the QRZ website **www.qrz.com/download/main/index.html** where I found, not only antenna programs, but 17 other categories, these being:

* Antenna Programs
* Amateur Radio Artwork
* Rig Control Programs
* Misc Demo Programs
* Amateur Radio Test Programs (US)
* Technical Data/Files
* Logbook Programs
* Linux - QRZ CDROM Lookup for Linux
* Macintosh Programs
* Misc Programs
* Radio Modification Files
* Morse Code Programs
* Packet Radio Programs
* Reference Material
* Satellite Programs and Files
* Scanner Radio Programs
* Slow Scan TV Programs
* Utility Programs

I'm sure that you'll have some fun looking through those lists, like the antenna software list shown in **Fig. 3**, to see what 'goodies' there

Fig. 1: The Stuffit.com website offers a cross-platform decompression utility..

Fig 2: The Winzip.com website, offers a *Windows* only utility.

Fig. 3: Antenna design software to be found on QRZ.com.

Fig. 4: The 'grand-daddy' of antenna design software may be found at emsci.com.

Fig. 5: Simple - but elegant antenna software may be found at G4FGQ's site.

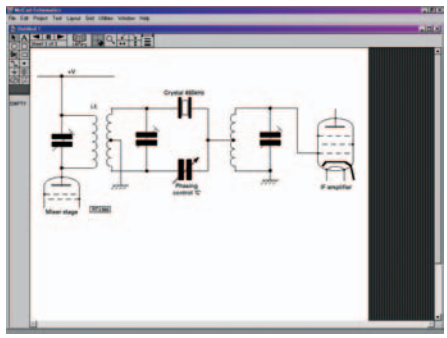

Fig. 6: *MCCAD EDS Lite* software in use.

are to find there. I cannot leave antenna software without at least mentioning the *NEC* group of programs for antenna calculations. You can download from the website **www.emsci.com** a 'free' copy of *Expert MININEC Classic,* **Fig. 4,** that will keep you busy over the winter designing antennas to try out next 'antenna growing' season!

TOP OF THE LIST

One other source of software that came close to the top of the list was a rather long list of programs on the website of **Reg Edwards G4FGQ**, **Fig. 5**, who emphatically denies being an ogre on his website **www.btinternet.com/~g4fgq.regp** Just why this statement is made, I'll leave you to look up when you visit his site. The software, like the site, is simple, comprehensive but effective!

After designing and calculating an antenna, you may consider drawing up some circuit diagrams for your club magazine , or perhaps, for an article in *PW,* but what software should you use for that? Well, one answer is to set google looking for "electronic schematic drafting" software. And I'm sure you'd be kept happy looking at the results of the search for some time. But perhaps, I could make a suggestion of one package that you might like to start with.

For many years here at *PW,* we've used a program called *McCAD* from **Vamp Inc.** to draw our circuit diagrams. And there's a 'free' version called *EDS Lite* that's available for either the Macintosh, that we use, or for *Windows.* It's available to download from quite a few locations, but you might like to look at **www.files32.com/info20969.htm** for the *Windows* version, or at **www.apple.com/downloads/macosx/math_science/mccadedslite.html** for the Macintosh *OS-X* (ten) version.

For those of you who do not have broadband Internet connections, the files are quite large so, it could take some time. Or you could always get a friend with broadband to download it for you! For circuit diagrams *McCAD EDS Lite* **Fig. 6** is more than adequate for most readers and it's a fully fledged program, which I'll look more closely at next time.

Fig. 7: The NOAA site features more than just weather watch information.

COMPLETELY DIFFERENT

Now, as they say, for something completely different! I've spent some time recently looking at the American NOAA site **www.noaa.gov** to see, **Fig. 7**, what the progress and consequences of the various tropical storms and hurricanes have been on the state of Florida. The reason - the XYL is due to go on holiday there in a few weeks time (as I write this in September) and she wanted to be sure that she had somewhere to stay when she visits friends who live there.

So, for the past several weeks I've spent quite some time looking at the rather worrying satellite images that have been available from the site, as shown in the picture of **Fig. 8** which show in stark detail the sight of hurricanes *Ivan* and *Jeanne*.

In an effort to find a continuity of what was actually happening, I found a piece of software that kept track of this year's storms and showed their actual and predicted paths. That piece of software, *Megatrack* is available, from **http://weather.rudis.net/megatrack/** for both *Windows XP* and the Macintosh *OS-X* (ten). There is another version called a '*Unix* distribution', but I've not been able to discern, which variants it will work under.

In use *MegaTrack,* **Fig. 9**, displays a large scale map of America, the Atlantic and the Carribean area with annotated tracks of the various storms. You can select either all, or only the presently active storms, on the map and follow the course of their paths as both past and predicted positions of the 'eye' of the storm. I found it interesting to note that two that went up northwards through the middle of the Atlantic were the probably cause of strong winds on our own shores.

Well, that's all the space I have, I'll see you next time, when I will try to look a little closer at *McCAD EDS Lite* among other subjects.

73 Tex G1TEX

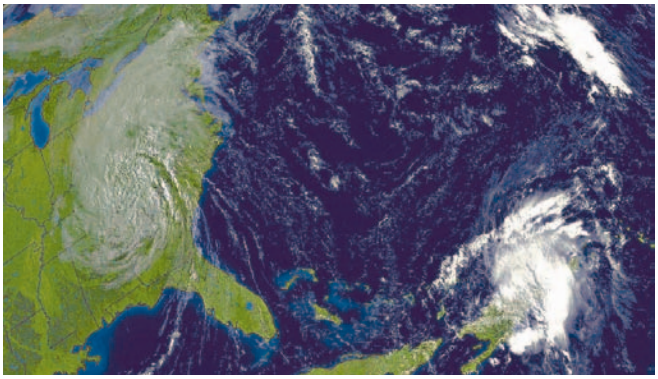

Fig. 8: Hurricane *Ivan* loses energy as it tracks over land, while hurricane *Jeanne* gathers pace towards the Dominican Republic.

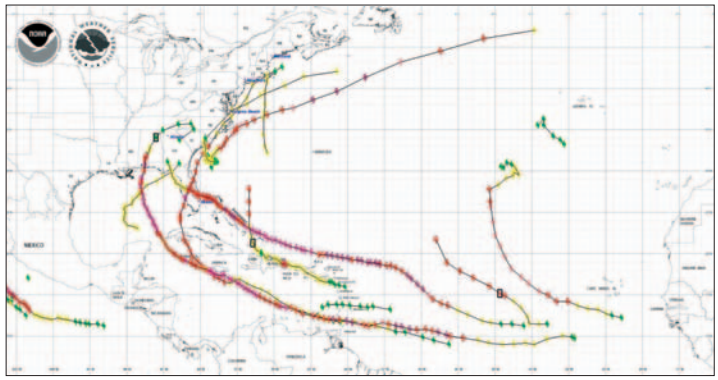

Fig. 9: See the tracks of this year's storms with *Megatrack*.

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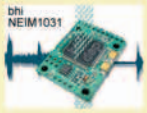

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Will tune AR-8200, AR8000 & IC-R10
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SWR meter

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Watson W2000
Bands 6m/2m/70cm
Gain 2.15/6.2/8.4dB
Power 200W (50W 6m)
Type 1/2, 2x5/8, 4x5/8
Length 2.5m
£69.95

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Bands: 80/40/30/20/15/10
Height (Adj): 26 ft (7.9 m)
Weight: 12 lbs (5.4 kg)
Impedance: Nom 50 ohms
VSWR: 1.5:1 or less
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Hustler 5-BTV
5 Bands - 80-10m
Height 7.64m - Weight 7.7kg
SWR 1.15:1 - Power 1kW
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Nomic 4P	£59.95
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Tonna - 20655
23cms (1296 Mhz) 55 element 21.5 dbi gain "N" 4.64m long.

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HF20FX 20m Mobile	£39.95
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SG-7900 2&70 Mobile	£31.95
CR-627 6&2&70 Mobile	£33.95
X-200 2&70 Base	£58.95
X-300 2&70 Base	£63.95
X-510 2&70 Base	£98.95
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1KW Auto ATU - 1.8-54MHz - 1-8 secs Tune - Approx SWR Rating of 10:1

£499.95

LDG Z-100

100w Auto ATU - 1.8-54MHz - 0.5 - 6 secs

£129.95 ***BEST SELLER****

LDG AT-11MP

100w Auto ATU - Covers 1.8-54MHz
1-5 secs Tune - Cross needle meters

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LDG RT-11

100w Waterproof Auto ATU - 1.8-54MHz
1-5 seconds Tune

£179.95

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1:1 or 4:1 Balun - Covers 1.8 - 30Mhz
Power rating 200w

£29.95

LDG AT-897

100w Auto ATU for FT-897 - 1.8-54MHz

£199.95

Accessories:

K-OTT Kenwood Interface	£49.95
Y-OTT Yaesu Interface	£54.95
Icom-IC1 Icom Interface	£29.95
Alinco-IC1 Alinco Interface	£29.95
AC-1 Cable	£19.95

W4RT Electronics

One-Plug-Power

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now.

OPP-817
£54.95

NEW! 1800 mAh Large Capacity FT-817 Internal Battery Soluion Still use Internal 817 Charger

OPP-897
£99.95

One Plug Power for the FT-897 4500 mAh; Fully Compatible with the FT-897 and Yaesu Charger.

NEW!

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One-Big Punch

One BIG Punch (OBP) is a custom add-on accessory for the Yaesu MH-31 microphone commonly used with many Yaesu amateur radios

OBP
£49.95

Speech Compressor for the Yaesu MH-31 mic and FT817, FT857, FT897. Improve the TALK POWER.

Hand Mike
£57.95

W4RT Electronics Microphone with One BIG Punch Speech Compressor included.

The One BIG Punch is an AF-based speech compressor specifically configured to provide remarkable increase in talk power while maintaining good audio quality. The OBP is NOT a clipper, but a compressor providing great voice compression, high-level limiting, and noise gating. The unit can be mounted inside the MH-31, requires no additional electrical power, and can be turned on or off by using the MH-31's TONE switch.

One-Board-Filter

The One-Board Filter (OBF) affords you the opportunity to have both the Collins CW and SSB mechanical filters available in your FT-817 together!

OBF
£229.95

Replace two filters in the space of one. OBF includes the two optional filters and fitting.

Collins Mechanical Filters
for the Yaesu FT-817, 857 & 897.

500 Hz CW - £94.95 ***2.3kHz SSB - £94.95***

This is the option that many, many FT-817 owners have requested. The OBF utilizes Collins Mechanical Filters that are the same as used in the optional Yaesu filters for the FT-817. The bandwidth of the 7-pole CW filter is 500 Hz and the 10-pole SSB filter is 2.3 kHz. The One-Board Filter is NOT available for installation by FT-817 owners. This is not a "do-it-yourself" option. The One-Board Filter must be installed by RADIOWORLD, or a competent engineer . If in doubt please call for details.

One-Touch-Tune

At the touch of a button, you have the carrier needed for tuning. One-Touch Tune (OTT) is totally transparent to the FT-817 and to any external equipment that you have attached to the rig.

OTT-817
£54.95

It requires no external power and works with both manual and automatic tuners.

W4RT OTT-FT817	£54.95
W4RT OTT-FT100/857/897	£54.95
W4RT OTT-FT847	£54.95
W4RT FT817 One Fast Charger	£Call
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Simply snaps into position. Adjust for desired height. Complete with non slip feet and allen wrench.

Professional-Grade FT-817 Stand

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*Available and IN STOCK now**

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For arm chiar or DX audio tailored to *your* own specifications.

Adapter cables to fit Icom - Kenwood - Yaesu £22.95

ATX Walkabout

ATX Walk--about PL-259

£47.95

The ATX Walkabout covers all bands (including WARC bands) from 80-6m, 5W guaranteed, 25W max. When fully telescoped it is about 65 inches long. This makes it ideal for the FT-817 or any other portable HF radio.

ATX Walkabout BNC	£47.95
ATX Walkabout PL259	£47.95
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The Miracle Whip

RX - 0.6 to 460 Mhz
TX - 40,30,20,17,15,12, 10, 6, 2m & 70cm

Power Limits 25W PEP 10W Cont.

£127.95

In Stock*

* The Miracle Whip will transmit on almost any frequency you are licensed to use including WARC, MARS/CAP, Alaska Emergency, Citizens Band, Marine, and most commercial HF SSB and VHF/UHF channels

** The Miracle Whip is optimized for for best receive rather than lowest swr on 80 and 160, as no short antenna will present good transmitting opportunities at these frequencies

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Siro MAG 145 PL	£22.95
Solarcon Magz-17	£39.95

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RF Drive: 5W (FT817)
RF Output: 50W PEP (25W AM)
Power: 13.8V 10A max

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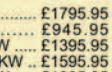

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YAESU

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£69.95 A 100m Drum

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Flexweave-PVC-50 50m	£39.95
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3 core	£0.45 per Metre
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20A DC Cable	£1.00 per Metre
25A DC Cable	£1.10 per Metre

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Cushcraft A3S 10/15/20 3ele	£299.00
Butternut HF6V Vertical	£175.00

PLUS MUCH MORE... CALL FOR DETAILS

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Kenwood YK88SN	£40.00
Yaesu XF114SN	£60.00
Yaesu XF112C	£40.00
Icom FL-53	£100.00
Icom FL-101	£40.00
Kenwood DRU-3	£70.00

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AEA PK-96 TNC £90.00
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Alinco DJ-X2000 Scanner 0.1kHz-2.1GHz £299.00
Alinco DJ-X10 Wide Band Receiver £200.00
Alinco DR-150 2m Transceiver with Air-and Receive £150.00
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AOR AR-8200 MkIII AR-8200 MkIII Receiver £299.00
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Bnos CLP430/25/100 70cms 100w Amp £199.00
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Comet CD-270D SWR Power Meter £49.00
Commtel Comm-225 Receiver £150.00
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Daiwa CN-801H 1.8-200 MHz SWR+PWR Meter £80.00
Daiwa CS-201 2 way Switch £10.00
Daiwa PS120 10A PSU £40.00
Daiwa PS-30 XM II 30A PSU £99.00
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Icom IC-R71E Receiver £325.00
Icom IC-R72 Receiver £350.00
Icom IC-R75 HF/6M Receiver £450.00
Icom IC-R8500 Receiver £999.00
Icom IC-W31E Dual Bander £160.00
Icom PS125 25A PSU £225.00
Icom RC-7000 Remote Control £40.00
Icom SM-20 Desk Microphone £90.00
Icom SM-6 Icom microphone £75.00
Icom IC-756PRO2 HF/6 DSP Base £1,599.00
ICS AMT-2 All Mode Terminal Unit £40.00
Jil Jil SWR Meter SWR Meter £15.00
JPS NIR-10 Noise / Interference Reduction Unit £99.00
JPS NIR-12 DSP Filter £129.00
Junker Pump Key Pump Key £75.00
Kamtronics KAM Multimode TNC £140.00
Kent RA Morse Paddle Key £40.00
Kenwood AT120 ATU matches TS120 £89.00
Kenwood AT250 Auto ATU £199.00
Kenwood AT250 Auto ATU £199.00
Kenwood AT300 Tuner £275.00
Kenwood IF232 IF-232 £50.00
Kenwood LP Filter LP Filter £30.00
Kenwood MB-201 MB-201 £20.00
Kenwood PS-30 PSU £89.00
Kenwood R-2000 Receiver Inc Converter £275.00
Kenwood R-5000 Receiver £499.00
Kenwood R-5000 Receiver inc VHF Converter £600.00
Kenwood SP-430 Kenwood Speaker £45.00
Kenwood TH-79E Dualbander Handie £170.00
Kenwood TH-G71E Dualband Handie £129.00
Kenwood TH-G71E Dualband Handie £129.00
Kenwood TH-K2E 2m Handie £99.00
Kenwood TM-D700E Dualbander TNC £299.00
Kenwood TM-V7E 2m/70cms £250.00
Kenwood TR-751E 2m Multimode Transceiver £250.00
Kenwood TR-9000 2m Multimode £220.00
Kenwood TS-2000 All Band / All mode Tranciever £1,299.00
Kenwood TS-271E TS271E £165.00
Kenwood TS-480HX HF 200w Mobile £850.00
Kenwood TS-570DGE HF 100w £675.00
Kenwood TS-570S HF + 6m Trx (VERY RARE!!) £825.00
Kenwood TS850S HF £550.00 & TS850SAT inc Tuner £699.00
Kenwood TS-870 HF DSP Base £899.00
Kenwood TS-940 HF Base £450.00
Kenwood TS-950SD HF150W DSP Base Station £1,200.00
Kenwood TS-950SDX HF150W DSP Base Station £1,599.00
Kenwood TMG707 2m 70cm mobile £199.00
Linear Amp UK Challenger II 2KW HF Amp £1,395.00
Lowe HF-150 HF Reciever £150.00
Lowe HF-225 HF Receiver £175.00
Lowe HF-350 HF Receiver £295.00
Lowe Keypad Lowe Keypad £30.00
MFJ 9406X 9406X 6m TRX £99.00
MFJ MFJ-1112 DC Outlet £25.00
MFJ MFJ-1272B TNC / Mic Switch £20.00
MFJ MFJ-1278 TNC All Mode £175.00
MFJ MFJ-202B Noise bridge £49.00
MFJ MFJ-442 Elec + memory keyer £89.00
MFJ MFJ-704 Low pass filter £30.00
MFJ MFJ-722 CW / SSB Filter with 5 Watts Amp £59.00
MFJ MFJ-784 DSP Filter £149.00
MFJ MFJ-9015 15m cw TRX £99.00
MFJ MFJ-921 VHF 200 Watt ATU £50.00
MFJ MFJ-949D ATU £99.00
MFJ MFJ-956 Rx ATU £25.00
MFJ MFJ-962B MFJ962B £99.00
MFJ MFJ-986 1.5Kw Tuner £250.00
MFJ MFJ-949E ATU £109.00
Microset PT135 PSU £120.00
Microset RU-432 70cms Amp 100w £150.00
Microwave Mod 432-50 70cms Amp 50w £99.00
Microwave Mod MML/432/50 70CMS AMP £129.00
Nissei DC300GL 30A PSU £80.00
Palstar PS-15 15 Amp Power Supply £49.00
Palstar PS-30N PSU £79.00
Palstar PS-50 50A PSU £139.00
Realistic PRO2004 Base Scaner £89.00
Realistic PRO2005 25-13000 Scanner £119.00
SGC SG-231 Smart Tuner £275.00
Sommerkamp FT-290R 2m Multimode Transceiver £150.00
Sony ICF-SW7600GR World band Receiver £99.00
Standard C-156E 2m Handheld Transceiver £125.00
Starmaster Memory Keyer Electronic memory keyer £59.00
Target HF3 HF3 RX £99.00
Tentec Paragon HF BaseInc. Speaker £700.00
TenTec RX-350 HF Receiver £999.00
Timewave DSP9+ External DSP Unit £99.00
Timewave PK-12 Packet £99.00
Trio PS-430 Kenwood PSU 22A £100.00
Trio R-1000 HF Reciever £170.00
Trio TR-9130 2m multimode £220.00
Trio TS-530SP TS530SP £299.00
Trio TS-711E 2m Base £350.00
Uniden UBC-780XLT Scanner/Trunk Tracker £249.00
Yaesu DSV2 Voice recorder £139.00
Yaesu FC-20 ATU for FT847 £175.00
Yaesu FC-700 ATU £99.00
Yaesu FL-2025 Amplifier £90.00
Yaesu FP-700 Power Supply £100.00
Yaesu FP-707 PSU £110.00
Yaesu FP-757GX 757 PSU £99.00
Yaesu FR-101 HF, 2m, 6m Base Transceiver £399.00
Yaesu FRG-100 HF Receiver £299.00
Yaesu FRG-8800 RX £199.00 or inc Converter £299.00
Yaesu FRG-9600 RX VHF/UHF £199.00
Yaesu FRT-7700 FRT-7700 £70.00
Yaesu FRV-7700 Converter for FRG-7700 £60.00
Yaesu FT-100 HF/6m/2m/70cms Mobile Transceiver £499.00
Yaesu FT-1000MP AC HF Base £1,199.00
Yaesu FT-1000MP Field HF DSP Base £1,599.00
Yaesu FT-1000MP MkV DSP HF Base £1,799.00
Yaesu FT-200 FT200 £175.00
Yaesu FT-2600M Mobile VHF / FM Transceiver £120.00
Yaesu FT-290R Mk II 2m multimode £250.00
Yaesu FT-290RmkII 2m Multimode Mobile Transceiver £225.00
Yaesu FT-41R Handheld Transceiver £120.00
Yaesu FT-470R Dual Band Handheld £129.00
Yaesu FT-690R 6m Multimode Mobile Transceiver £199.00
Yaesu FT-7100M 2m / 70cms Mobile Transceiver £220.00
Yaesu FT-736R 2/70 Base £550.00 or 6/2/70 £750.00
Yaesu FT-767GX HF/6/2/70 Base £799.00
Yaesu FT-76R 70 cms Handheld Transceiver £99.00
Yaesu FT-77 HF inc FM £275.00
Yaesu FT-7800 2/70 mobile £199.00
Yaesu FT-8100R 2m / 70cms Mobile Transceiver £220.00
Yaesu FT-817 Mobile HF, VHF, UHF Transceiver £450.00
Yaesu FT-840 HF 100w Moble £399.00
Yaesu FT-847 HF/6/2/70 BASE £899.00
Yaesu FT-897 Portable £699.00
Yaesu FT-920AF HF / 6M Base Transceiver £899.00
Yaesu FT-980 FT980 £399.00
Yaesu FTV-1000 200 W Transverter £475.00
Yaesu MW-1 Remote Control Microphone & Infra-Red £60.00
Yaesu NC70 Battery Charger £60.00
Yaesu Quadra 1KW Amp + PSU £2,750.00
Yaesu SP-980 SP980 £60.00
Yaesu VR-500 Yaesu Handheld Scanner £149.00
Yaesu VR-5000 Top Class Base Scanner £450.00
Yaesu VX-110 VX110 £99.00
Yaesu VX-1R VX1R £99.00
Yaesu FT-747 HF Trx £299.00
Yaesu FV-101Z FV101Z £125.00
Yupiteru MVT-7100 Handheld Scanner £140.00
Yupiteru MVT-9000 II MVT9000II £269.00

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Trader's Table

The equipment for sale on this page is secondhand or ex-demonstration

THE SHORTWAVE SHOP

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TRANSCEIVERS

ICOM IC735 HF TRANSCEIVER £299
ICOM IC746 HF/6/2mtr TRANSCEIVER £895
ICOM IC 706 Mk2G HF/VHF/ UHF TCVR £495
ICOM IC471E UHF MULTIMODE TCVR £395
YAESU FT290R MK1 VHF TRANSCEIVER £145
YAESU FT897 HF/VHF/UHF TCVR £675
YAESU FT990 HF TRANSCEIVER £650
YAESU FT2700RH VHF TRANSCEIVER £165
YAESU FT690R MK2 50Mhz MULTIMODE £235
YAESU FT790R UHF TRANSCEIVER £225
ICOM IC Q7E VHF/UHF TRANSCEIVER £135
ICOM IC275H VF MULTIMODE TCVR £450
ICOM IC 706 Mk1 HF/VHF/ UHF TCVR £455
KENWOOD TS2000B HF/VHF/ UHF TCVR £950
KENWOOD TS50 HF TRANSCEIVER £395
YAESU FT 726 50/144/433 TCVR £425
YAESU FT1500M VHF MOBILE TCVR £120
YAESU FT 736 50/144/433Mhz TCVR £595

RECEIVERS

NRD JRC 515 HF RECEIVER WITH SPKR £625
ICOM PCR1000 HF/ VHF/UHF RECEIVER £249
FAIRHAVEN RD500 REVEIVER £495
ICOM IC-R75 HF RECEIVER £495
KENWOOD R5000 HF RECEIVER £425
KENWOOD R1000 HF RECEIVER £135
YAESU FRG100 HF RECEIVER £265
YAESU FRG100 HF RECEIVER + PSU £295
AKD HF3 HF RECEIVER £95
ALINCO DJX-3 H/H SCANNER £89
AOR 3000A WIDE BAND RECEIVER £349
AOR 7030+ HF RECEIVER £625
YUPITERU MVT8000 BASE MOBILE RCVR £179
YUPITERU MVT7100 H/H RECEIVER £145
YAESU FRG100 RECEIVER inc PSU £295
YAESU VR5000 WIDE BAND RCVR £399
YAESU FRG8800 HF RECEIVER £225
BEARCAT 9000XLT BASE SCANNER £165
PRO 2006 BASE SCANNER £125
PRO 2042 BASE RECEIVER £165
PRO 2004 BASE SCANNER £125

ACCESSORIES

KENWOOD BC15A CHARGER/TH28/78 ..... £39
KENWOOD SP31 SPEAKER 850/870 ..... £75
KENWOOD PS31 PSU 850/870 ..... £135
GLOBAL 2000 SWL ANTENNA TUNER £69
MFJ 931 ARTIFICIAL EARTH UNIT £89
YAESU FP1030A 30A POWER SUPPLY £139
YAESU FP707 POWER SUPPLY £85
WATSON SUPER SEARCHER COUNTER £65
LGD LT897 ATU FOR YAESU FT897 ..... £149
TIMEWAVE DSP5 9+ DSP UNIT £89
YAESU MD100A8D BASE MIC £89
YAESU FT100 FM UNIT £25
DATONG FL3 FILTER UNIT £89
HF MODULE FOR FT726 ..... £125
RTTY BOARD FOR NRD 525/535 ..... £95
RTTY TUNING INDICATOR UNIT £35
DAIWA PS30 25A POWER SUPPLY £70

Visit www.shortwave.co.uk for latest list

NEVADA

023-9231 3090

Alinco DJC5 Microsize 2m/70cms Handy Transceiver £129
Alinco DJG5EY Dualband Handheld with Accessories £199
Alinco DR140 2m FM 50w Transceiver w/wideband RX £129
Alinco DR605 Twinband FM Mobile Transceiver £190
Alinco DR610 Dual Band Mobile Transceiver £180
Icom D7E Dualband Handheld with Wideband RX (30-1300Mhz) £119
Kenwood TR7730 2m FM 25w Transceiver £89
MFJ 9402X 7w SSB 2m Transceiver £149
Trio TS700s 10w All mode 2m Base Tx with Ext VFO £299
Yaesu FT290II 2m All Mode Transceiver with 25w Amp & Case etc. £249
Yaesu FT726R 2M/70CM All Mode 10W Base Transceiver £499
Yaesu FT726R 2M/70CM All Mode Base Transceiver £399
Yaesu FT726R 2M/6M All Mode 10W Base Transceiver £395
Yaesu FT736R VHF/UHF All Mode Transceiver £699
Yaesu VX2E Twinband Compact Handie with Wide Receive £139.95
Alinco DJX2 Handheld Scanning Receiver £89
Alinco DJX3 Wideband Handheld Scanner £89
Alinco DJX3 Handheld Scanner c/w accessories & book £159
AOR AR8200 Mk II Wideband All Mode Handheld Scanner £229
Bearcat 220XLTHandheld Scanning Receiver £99
Bearcat UBC220XLTHandheld Scanning Receiver £99
Bearcat UBC3000XLT Handheld Scanning Receiver £130
Bearcat UBC780XLT Trunk Tracker Base Scanning Receiver £229
Icom R2 Wideband AM/FM/WFM Handheld Scanner £95
Icom R2 Wideband AM/FM/WFM Handheld Scanner £95
Maycom FR100 Handheld AM/FM Compact Scanning Receiver £56
Realistic PRO2005 Wideband Scanning Receiver £120
Yaesu VR120D Handheld Scanning Receiver £120
Yupiteru MVT7100 All Mode Handheld Scanner - only 2 weeks old £175
Yupiteru MVT9000 MK II All mode Scanning Receiver with case £275
Yupiteru MVT9000 MK II Wideband Scanning Receiver £229
Grunidg YB500 Receiver £99
Icom R75 Base Receiver £499
Icom R8500 All mode 0-2Ghz Communications Receiver with PS £850
Joyear WS2000 Portable Worldspace Recever £79
NRD JRC545DSP Base Receiver £849
Palstar R30 Receiver £325
Roberts 9914 FM/MW/LW/SW Receiver £65
Sony ICFSW07 All mode s/w receiver & Active Loop Antenna £159
Steepletone 747 Portable Shortwave Receiver £65
Yaesu FRG8800 General Coverage Receiver £299
Yaesu FRG8800V HF Receiver + VHF Converter £325
Yaesu VR5000 All Model 100KHz-2600MHz Base Receiver £469
Icom 7400 HF/2m/6m Base Transceiver w/Autotuner/DSP £1049
Icom 756 Pro 100w HF/6m Base Transceiver £999
Icom IC7400 HF/6M/2M100W Transceiver £1095
KENWOOD TS-430S 100W HF TRANSCEIVER £349
Kenwood TS850SAT 100W HF Transceiver with Auto Tuner £695
Kenwood TS870SAT 100w DSP HF Transceiver with Auto Tuner £999
Yaesu FT1000 Mk V 200w HF Trans c/w 2 SSB Filters/
RC Keypad/Voice Unit £2295
Yaesu FT847 HF/50/144/430Mhz Base Transceiver £799
Perstel Bluenote Personal DAB Radio £59
Pure Evoke 1 DAB Radio (Mains Only) £55
Pure ST1 DAB Extension Speaker £15
Videologic DRX601ES DAB Tuner £159
Realistic TRC1004 Handheld CB Transceiver £20
Skipmaster SK45000 Base Microphone (CB) £45
Zetagi HP202 CB SWR/Power Meter £20
Zetagi M27 Antenna Matcher £20
Zetagi M27 Antenna Matcher £20
Amdat ADC60 Frequency Standard Clock £99
Cobra CA79 Handheld Echo Microphone £29
CTE HQ30 4 Amp Power Supply £30
Daiwa 403g 70cms Preamplifier £22
Dewsbury S/TUNER Super Tuner £25
Elmic CONTROLS Noise Limitor £10
Hansen FS302m 50/150Mhz 20/200 Meter £30
Hitachi KH-YG1 Worldspace Yagi Kit £39
Icom AT160 Coaxial Auto ATU £179
Icom SM20 Base Microphone c/w OPC Adaptor Lead £110
Icom SM20 Base Microphone £95
Jim M75 Preamplifier £49
Jim NF96XI Filter £15
Kent Brass Key Brass Key £49.95
Maldol AH212 2M/70/23CM Handi Antenna £15
Maldol EX104 2M/70CM Mobile Antenna £15
MFJ 949e Versa Tuner II - 1-30Mhz Antenna Tuner £119
Miracle Whip All band portable antenna for FT817 ..... £99
MML144/40 2M 40W Amplifier & PreAmp £69
NAG 2200 2m Amplifier £299
Palstar PS04 4-6Amp Power Supply £12
Tono Q-550 Data Terminal £69
Trio TL922 HF Amplifier £895
TSA Duplexer 1-30 / 350-540 Duplexer £14
Yaesu FC107C Antenna Tuning Unit £175
Yaesu FC20 Auto Tuner £150
Yaesu MD1B8 Yaesu Desk Microphone £79
Yaesu MH35A2B Speaker/Mic for older models £19
Yaesu Sp8 Speaker £99.95
Yaesu YSK100 Separation Kit £29.95
Zetagi HP1000 Antenna Tuner/Meter 26-28MHZ £45

Check our web site for latest Items available. E&OE Prices quoted are in pounds sterling and exclude carriage.

SOUTH EAST COMMUNICATIONS

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STATION ACCESSORIES

Ameritron AL-800XCE 1.25kw amp save £750, now.... £1249
Kenwood SP23 matching speaker for TS570 ..... £69
Global AT2000 SWL ATU £79
Paccomm Spirit2 9600 baud TNC £99
Garmin Street pilot mint european base maps £299
Watson 30-35amp PSU with meters £89
Datong FL-3 multimode filter £99
MFJ949E 300watt tuner with dummy load £125
Kenwood SP-23 matching speaker for TS570D £55
Heil HM-10 dual insert studio quality mic £99
Watson WMM-3 multimode data decoder £45
Kenwood desk mic MC80 ..... £60

VHF/UHF TRANSCEIVERS

Yaesu FT2600 65watt 2meter mobile £139
Yaesu FT8800 2m/70cm latest dualband mobile £279
Kenwood TMV7E blue display 2m/70cm mobile £299
Yaesu VX5R 6M,2M,70CM handi, last new unit £249
Kenwood TM255E 2m 45watt multimode,mint £399
Kenwood TR751E 2m 25watt multimode mobile £349
Icom ICT8E 6m,2m,70cm tri-band handi,nicads £199

HF TRANSCEIVERS

Yaesu FT1000MP Mark V 200watt all filters fitted
Digital voice recorder boxed and mint £1899
Yaesu FT1000MP auto ATU,DSP mint £1349
Yaesu FT890 auto ATU,100watt £499
Yaesu FT857 HF to 70cms Demo model £599
Alinco DX77E 0-30mhz 100 watt mint £399
President Lincoln 10m Amateur transceiver new £199
Kenwood TS480SAT demo HF,6 auto ATU £949
Yaesu FT-900AT 100watt all mode detachable head £549
Yaesu FT767GX HF,6,2m fitted auto ATU AC £599
Icom IC728 0-30mhz FM board fitted boxed £449
Kenwood TS440SAT 100watt 100mem auto ATU £499
Yaesu FT1000 MKV field auto ATU,DSP,AC £1449
Kenwood TS870S DSP, Auto ATU, boxed £999
Yaesu FT847 HF+6m+2m+70cm mint £899
Kenwood TS870S DSP,auto ATU boxed and mint £999

SHORTWAVE RECEIVERS

Lowe HF250E remote control £339
Lowe HF225 0-30mhz keypad option bowed mint £269
Sony SW55 portable receiver all mode 0-30mhz £199
AOR3000A 0-2036mhz AM,FM,LSB,USB mint £599
Sony SW100E Tiny Shortwave 0-30mhz+VHF £119
JRC NRD525 Top class 0-30mhz receiver £499

SCANNERS BASE/MOBILES

Uniden Bearcat 220XLT 66-956mhz £99
AOR5000 0-2600mhz all mode, boxed £1099
AOR3000A 0-2036mhz all mode 400 mems,mint £599
Yaesu VR5000 0-2600mhz all mode £499
Bearcat 780XLT 25-1300mhz trunk tracker Demo £279
Alinco DX10E 1000 channels 0-2000mhz handheld £225
Bearcat UBC278cxl base scanner 100mems demo £139
AOR 8600 0-2040mhz £455
Yupiteru MVT7100 0-1650mhz nicads etc £169

All prices in Sterling

WATERS & STANTON

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HF Transceivers

Alinco DR-M03SX 10m FM Mobile 28-29.7MHz 10W £159
Alinco DX-77E HF Base Transceiver with Gen.Cov. 100W 12V £349
Icom IC-703 HF& 6m All Mode QRP mobile + Gen.Cov. 10W £449
Icom IC-726 HF + 6m All Mode Base + Gen.Cov. 100W 12V £499
Icom IC-7400 HF,6m,2m All Mode Base + DSP, ATU & Gen.Cov. 12V £949
Kenwood TS-870S Base with Gen. Cov. + ATU & DSP in the IF, 100W 12V £949
Yaesu FT-100 HF,6m,2m,70cm All Mode with Gen.Cov. RX 12V £449
Yaesu FT-107M HF Base Transceiver with Gen. Cov. RX 100W 12V £329

VHF/UHF Base/Mobile Transceiver

ADI AR-147 2m FM Mobile 50W CTCSS 40Ch. £149
Alinco DR-M06TH 6m FM Mobile 20W CTCSS £159
Icom IC-2000H 2m FM Mobile 50W, 10W + Alphanumeric Memories £129
Icom IC-2100H 2m FM Mobile 55W 113ch. + CTCSS £169
Kenwood TM-451E x2 70cm FM Mobile 35W 2m RX, Full Duplex £249
Yaesu FT-790R II 70cm All Mode Portable 2.5W + FL-7025 25W Linear £249

VHF/UHF Hand Held Transceiver

ADI AT-200 2m FM H/Held with Battery box £89
ADI AT-400 70cm FM Battery box 420-465MHz RX £89
Alinco DJ-190T 2m FM H/Held + CTCSS £99
Alinco DJ-G5 x2 2m/70cm FM + Wide RX, DTMF keypad & CTCSS £189
Icom IC-M1 euro VHF FM Marine 5W + Dual & Tri Watch £199

Shortwave Receivers

AKD HF-3E 30kHz-30MHz AM,SSB 12V with Interface and PSU £129
AOR AR-7030 0-32MHz All Mode Receiver 12V with PSU £449
AOR AR-7030 0-32MHz All Mode with Processor,NB & NiCd + PSU £499
AOR AR-7030+ 0-32MHz Receiver + Notch filter, NB & Filters 12V £599
Grundig SAT-800 1.8-30MHz Portable Receiver + FM Stereo, SSB & Air £399
JRC NRD-525G 90kHz-34MHz All Mode Receiver 200Ch. Mains £449
Lowe HF-225 30kHz-30MHz All Mode Receiver & Keypad 12V + psu £249
Lowe HF-250 x2 30kHz-30MHz Receiver 12V PC Compatable £329
Roberts R-861 Portable 150kHz-30MHz SSB , FM stereo RDS £139
Sony ICF-SW07 Mini Receiver + FM stereo, SSB & "One Touch" tuning £169

Scanners Mobile/Base

AOR AR-3000 100kHz-2036MHz All Mode Receiver 400Ch. 12V £449
AOR AR-8600 500kHz-2040MHz All Mode Receiver 1000Ch. 12V £399
Fairhaven RD-500VX 10kHz-1750MHz All mode receiver + PSU (P.Sale) £525
Icom IC-PCR1000 500kHz-1300MHz All Mode PC Controlled 12V + psu £299
Icom IC-R8500 100kHz-2GHz All Mode Receiver 1000ch. 12V + PSU £899
Realistic Pro-2005 25-520,760-1300MHz AM,FM,WFM 400Ch. Mains/12V £149
Yaesu VR-5000 100kHz-2600MHz All Mode Receiver 2000Ch. 12V £429

Scanners Hand Held

Alinco DJ-X10 100kHz-2000MHz All Mode 1200Ch. £179
AOR AR-8000 500kHz-1300MHz All Mode 1000Ch. £169
Icom IC-R10 x2 500kHz-1300MHz All Mode 1000Ch. + RS-232 ..... £199
Opto R-10 x2 30MHz-2GHz FM Interceptor £99
Uniden BC-296D 25-1300MHz (+gaps) AM,FM,WFM + DigiDec. 1000Ch. £299
Uniden UBC-180XLT 25-960MHz (with gaps) AM,FM 100Ch.Alphanumeric £89
Yaesu VR-500 x2 100kHz-1300MHz All Mode Receiver 1000Ch. £149
Yupiteru MVT-7300 x4 521kHz-1320MHz All Mode + 8.33kHz step £229

Station Accessories

AEA PK-232 PakRat Dual Port Multimode Data Controller £79
AKD WA-1 120-450MHz VHF/UHF Wavemeter £29
Ameritron AL-811HX 10-160m 800W Linear Amplifier £599
Ameritron ATR-30X 1.8-30MHz 1.5kW Roller Inductor ATU + meter & Balun £349
Avair AV-200 1.8-200MHZ SWR,PWR meter 200W £39
Comet CF-BPF6 6m Band Pass Filter 150W £49
Datong ASP Auto Speech Processor £95
Diamond SX-600 1.8-525MHz 200W SWR,PWR meter + 2 sensors £99
Diamond SX-2000 1.8-200MHZ Automatic SWR,PWR meter 200W £79
Global CX-401 0-500MHz 4-Way Coax Switch + Lightning Protection £29
Icom SM-8 Desk Mic 1.3k/600ohm £89
JPS NIR-10 Noise / Interference Reduction Unit £199
JPS NTR-1 DSP Noise Reducer £99
Kantronics KAM Plus Multimode Data Controller with Pactor,Dual Port £199
Kantronics KPC-9612 x2 Dual port Dual speed Packet TNC Controller £229
Linear Amp Explorer 1200 10-160m Linear 10-130W in,100-1300W out (RMS) £995
MFJ MFJ-77 Remote Memory Keypad for MFJ-486 contest keyer £15
MFJ MFJ-281 1.5-250MHz (6 Bands) Dip Meter & Field Strength £99
MFJ MFJ-422BX Compact Electronic Paddle Keyer (fit your own key) £49
MFJ MFJ-462B RTTY,ASCII,CW,AMTOR Reader with Display 12V £119
MFJ MFJ-486 Grandmaster II Contest Memory Keyer £169
MFJ MFJ-784B x2 Tunable DSP Audio Filter £189
MFJ MFJ-962D 1.8-30MHz 1.5kW Roller Inductor ATU + meter £199
MFJ MFJ-1022 300kHz-200MHz Active Receive Antenna 9V £39
MFJ MFJ-1214PC Multimode Interface for IBM FAX,CW,RTTY,ASCII £119
MFJ MFJ-1270C VHF HF Packet TNC £79
MFJ MFJ-1276 HF / VHF TNC with Precision Tuning + Pactor £129
MFJ MFJ-1278 Multimode 10 mode Data Controller £175
MFJ MFJ-1289M IBM Multimode Control Software £49
MFJ MFJ-8621 2m Packet Transceiver only £129
Microset PC-30 13.5A Variable 30A (max) Protected PSU with meter £119
Microset PT-105A 12V 5A (max) Protected Stabilized PSU £29
Microset PT-135 x2 12V 35A (max) Stabilized PSU £119
Opto 3000A + 10Hz-3GHz Frequency Counter £289
Palstar DL-300 DC-300MHz 300W max Dummy Load £35
Revex W-16B 140-150,430-450MHz 60W SWR,PWR meter £29
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Amateur Radio magazines, from 1982-2004, *RadCom*, *PW*, *Amateur Radio*, *Ham Radio Today*, *Radio Active*, some *QST* and *SWM*, about 700 magazines in total, £40 - buyer collects. Stewart G1HHO, nr Bournemouth. Tel: (01425) 621945, E-mail: gordon.reeve@btinternet.com

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Electronic keyer, Iambic, 5-35w.p.m., for practice or transmit, programmed PIC with automatic switch-off, plus easy-to-build details, very few extra components needed, £10. E-mail: chick@chickene.freeserve.co.uk

FRG-7 general coverage RX, g.w.o., £95 plus P&P at cost or buyer collects. Keith Taylor on (07855) 647150 or E-mail: taylor_k_m@hotmail.com

Full size G5RV, bought by new M3 who has no room for it! £14 inc. P&P. John G3EGC, QTHR. Tel: Bolton (01204) 301502.

Guide to VHF/UHF (RSGB publication), *Electrical Measurements, using a computer*, *Sony ICF0SW7600 Operating Instruction* (handbook), *Getting Started in Electronics* (Tandy/Archer), *Electronics In Practice*, *The Home Video Handbook Complete Guide*, *Victorian Inventions*, *Mullard Book4 CMOS-Digital Ics*, *Electrical Technology* (5th Edition), *Basic Electronics - Indoors & Diodes in Circuits*, *The Encyclopaedia of Radio & Television*, *10-4 Action Annual 1983*, *Big HAL's CB Handbook*, *British CB Book*, *James Watt & The Stream Revolution*, *Timelines World of History*. Open to offers, all are various postal weights, so please write with an s.a.s.e. as to your interest to: M. Evans, 85 Hillside Road West, Bungay, Suffolk NR35 1RH, E-mail: m.evans@mtxnet.co.uk

Icom 706 MuTek front-end for 2m (144MHz), all brackets, cables, for remote mobile use, £375. Mirage linear amp, 100W out 1/10 in, 2m, £110. 9-element cross Tonna, 2m, as new, £35. Tel: (01842) 878703.

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Kenwood TS-570D transceiver, 100W, £500. Also MFJ-962D Versa Tuner III, £125, rated 1.5kW, roller tuner. Buyer collects. G8AHU, Plymouth. Tel: (01752) 706503.

Kenwood TS-570DGE, mint, boxed, £525. Icom IC-703, mint, boxed, £375. AOR AR3000A+ v.g.c., £325. Ten-Tec RX-340, mint, cabinet, offers? Eddystone 1830/1, mint, cabinet, £300. Racal RA17/2, £150. AR88D, £60. Tel: Essex (01279) 815020.

Newnes manuals, TV Serv. Vol. 2, TV Serv. Vol 4, Radio TV, Vol. 5, Radio, Vol. 1, Radio Part 1 charts, *Solid State Design*, *ARRL VHF UHF Manual*, RSGB, *The ARRL Handbook*, 1988. G3OXV, QTHR. Tel: (01327) 702265.

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Realistic DX-302 communications receiver, u.s.b., l.s.b., a.m., c.w., 0-30MHz, digital read-out, very clean with manual, only, £90 includes carriage. Also Realistic desktop scanner, 200 memories, receives anything, £80. Tel: (01608) 663745.

Receivers: HRO Sp-600, Drake SP4, AR88, KW-202, BRT-400, Eddystone 730/4, Panadaptor, various valve bases/cans/ magnetic longwire balun, antenna swith, dummy load, lightning surge tube, £2. L.P.F., £10. Discone antenna, s.a.e. Bob Wright, 245 Sandy Lane, Hindley, Wigan, Lancs WN2 4ER, Tel: (01942) 255948.

Second-hand Kenwood TS-50, £360. Tel: Manchester 0161-688 9680.

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Operating handbook manual for Ten-Tec Delta 580 or photocopy. Tel: (01206) 865670.

Practical Wireless, May 1979 or photocopy of article. Also Sony ICF-SW77 receiver wanted, v.g.c. only please. Chris on (01438) 871975.

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Practical Wireless BO

Buy of the Month

VHF Amateur Radio

Written by W**illiam Orr W6SAI,** the American publication *VHF Amateur Radio* covers VHF propagation, repeaters, moonbounce, satellite communicaiton and almost everything you could want to know about coaxial cable and plugs. There are also designs for beam antennas and TV filters for the reader to build. Packed with easy to follow illustrations and operating information this book is a must for every Amateur wanting to operate on the VHF bands.

Normally, *VHF Amateur Radio* costs **£8.95 plus P&P** but this month you can get your copy for **£6.95** plus **£1.75 P&P UK**, **£2.75 P&P overseas**. As we have limited stocks please check availability before ordering. To order call **0870 224 7830** or post your order using the order form on **page 73** to: **Book Store, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**. Remember to include your payment (in Sterling, cash not accepted), name, address and telephone number with your order.

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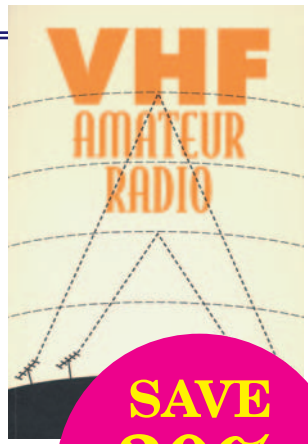

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topical talk

This month the Editor takes the opportunity to respond to readers' letters - particularly that from **Jon Robson G7MQL**. In his letter (page 11) Jon takes *PW* to task for seemingly promoting poor workmanship and 'dumbing down' technical content. Read on!

Of the work I prepare for the magazine, the Radio Basics (RB) series has consistently brought me the largest number of letters and feedback. When the series was introduced a few years ago - everyone here in the Broadstone editorial offices was amazed at the interest. It appeared there was a real need for the series.

The 'basics' approach adopted in the series has also seemed to appeal to a wider readership than I'd ever expected. It was originally aimed at getting the reluctant 'first timer' busy on the work bench.

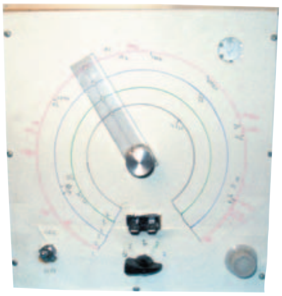
I've never pretended that the style adopted has ever been anything other than basic. Indeed, it wouldn't seem unfair criticism to say that most of projects presented (as I've built them) are simple, verging on the crude - and that's part of my deliberately considered approach.

In his letter this month, **Jon Robson G7MQL** takes me to task for seemingly 'letting the side down'. Jon explains his own background and laments the lack of skills that his profession and industry requires. He also comments on what he considers to be the 'dumbing down' of the editorial comment in *PW* and mentions how he thinks the late F. J. Camm would react in his final resting place on the outskirts of London!

Jon's first approach to me was by E-mail and we were soon busy with a lively correspondence and I was able to make him fully aware of my approach with the RB series. He wasn't aware of my physical difficulties when he first wrote to me, but in all honesty I don't think they are relevant. This is because I would still adopt the same approach if I had two arms and didn't suffer from severe arthritis!

Indeed, the whole idea of the RB practical projects reflects the 'bird's nest' approach. It doesn't matter how bad it looks at the prototype stage (remember those bird's nests of wire surrounding a circuit, which worked?) - first get it working. Learn, build it (even on a piece of board with drawing pins as terminals) and then when you've enough confidence - hard wire it or make a suitable printed circuit board.

I explained to Jon that I'm trying to convey to the reader the encouragement to 'Have a go yourself'. And I can remember being encouraged to build projects by F. J. Camm - using 'breadboards' and even baking tins as a chassis! Personally speaking (and I venture to say that many readers will agree) I still think there's a need for this simple approach in the *PW* of 2004. I suggest this because - try as I might - many of the novice constructors tell me they balk at even trying to make a simple p.c.b. and struggle with the simple projects we present. So, in whatever way I can, I'll do whatever is necessary to encourage newcomers, old hands who have tried home-brewing and those who want to experiment.



Incidentally, I'm just about to start the final fitting-out of my new workshop now that my wife and I have settled into our new home. The workshop is large - and I hope to be producing a variety of projects for RB readers. One of these will be the promised RB simple 'scope. I'm really looking forward to that!

Dumbing Down?

Jon G7MQL's comment on what he perceives as the 'Dumbing Down' of *PW* intrigues me. It does so because neither my publishers, colleagues nor I have taken any decision to support the suggestion.

In reality, over the last 15 years we have strived to bring as much interesting material as possible to our readers...including some really technically innovative projects. My most pleasing recent innovation - thanks to the hard work of **Tony Nailer G4CFY** - is his column Doing It By Design. Fortunately, readers seem to agree - and DIBD is already extremely popular with readers.

However, as I hinted in 'Keylines'- I've re-directed some of the critical energy to other directions. Both Jon and other correspondents (all seemed to have some excellent ideas - Jon especially so) have received their *Author's Guides*. Hopefully, we'll see some of their work published soon. **PW**

Fig. 1: Not smart looking - but the Radio Basics C/R bridge works well. It's simple enough in circuitry, theory and the simple construction is aimed at encouraging readers to 'have a go' (see text).

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