

Practical

WIRELESS



Britain's Best Selling Amateur Radio Magazine

The Heathkit HW101 It's a Classic!

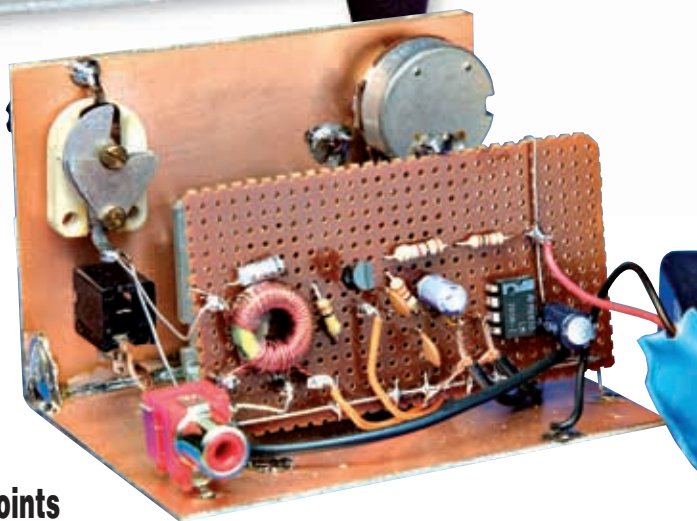


Practical Way
Build a 'Hartley Receiver'

QRP Contest Results
How did you do?

In The Shop
Antennas, switches & solder joints

Early Hobby Radio
Chas Miller continues his
fascinating series



R 45



9 770141 085099



WATERS & STANTON

Where To Find Us...

Hockley - Glenrothes

SCOTTISH STORE • W&S @ JAYCEE, 20 WOODSIDE WAY, GLENROTHES, FIFE KY7 5DF - CLOSED MONDAYS
• ENQUIRIES: 01592 756962 FAX: 01592 610451 EMAIL: jayceecom@aol.com OPENING TIMES: Tue-Fri: 9am - 5pm Sat: 9am - 4pm

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• ENQUIRIES: 01702 206835/204965 FAX: 01702 205843 EMAIL: sales@wspc.com OPENING TIMES: Mon-Sat: 9am - 5.30pm



NEW KENWOOD TM-D710e

New Dual Band 50W Transceiver **£399 C**

We give you APRS, Built-in TNC DTMF Mic and Weather Station ready



ULTIMETER Weather Instruments
The best in affordable weather technology



The TM-D710e has been designed to accept the Peet Bros Ultimeter weather stations. This enables you to function as a weather reporting station. Product details on opposite page

Don't Forget!

Saturday 13th October

Scottish Branch 10am - 4pm

JAYCEE Open Day

Wonder Wand Announce New Offer Price!



The Wonder Wand MkII (W-Wand-MkII) covers 40m to 6m and with its telescopic whip, it plugs directly into the SO239 socket of any receiver or low power transceiver.

The result is a compact antenna system that is ideal for portable work.

Now Only £59.95 D

PAY NOTHING FOR 6 MONTHS

BUY NOW PAY LATER AT ALL 3 STORES

AVAILABLE ON ALL SALES OVER £200

0% APR example: Cash price £600. Pay no deposit and pay the full amount by the due date with zero interest. **Pay no interest Q8 29.8%**
APR Repay £31.53 per month for 36 months, after the 6 month period. Total amount due £1135.06. Interest is calculated from the date of the agreement. All finance subject to status written quotation on request.

LOW INTEREST CREDIT (LIC) FINANCE

10.9% APR We now offer Low APR finance over 24 / 36 / 48 month periods, payable from date for purchase. All finance subject to status written quotation on request.

NEW

FlexRadio Systems

Software Defined Radio

Flex-5000 HF Transceiver 100W 160m - 6m



NEW - Performance Packed Radio

This new software transceiver brings you performance and features no other radio in the world can offer!

SSB CW AM FM from milliwatts to 100W, 105dB dynamic range at 2kHz! 33dB intercept point. Single Firewire cable to PC. No sound card needed. 24 bit sampling at 192kHz, TCXO 0.5ppm ref. xtal, True plug and play with PC or laptop. Self-test and calibrate. Many contest & DXing features - www.flex-radio.com

£1442.55 ex VAT
£1695 inc VAT

YAESU FT-450



160m - 6m 100W
SSB CW AM FM
IF DSP
Voice Memories
23 x 8.4 x 22 cm

FT-450AT with built-in auto ATU £739

Get FREE Extra DC Lead!

Exclusive to PW readers - request when ordering.

Also get voice recorder and announcer!

MH-36EBJ	DTMF Mic	£57.95 A
MD-100ABX	Desk mic	£118.95 C
Proset Headset	with leads	£92.90 C
HP-200	Headphones	£22.95 C
Power Mite	Travel PSU	£49.95 C
MHG-1	Carry Handle	£6.95 A
FC-30	Ext auto ATU	£249.00 C
ATAS-120	Mobile Ant	£259.00 C
Sidekick 60-6m	elec mobile Ant	£299.95 D
SP-160	Mobile Speaker	£9.95 A
SP-2000	Sun Visor Spkr	£19.95 A

Buy Now Pay 6 months Later! 0%

£639 D

W & S present the new FT-450 with our inclusive 24 month warranty. This new model has been designed from the ground up, to harness Yaesu current technology into a no-nonsense HF transceiver. It comes with these mouth watering features: 4-pole roofing filter, Fast IF shift, Notch filter, Contour control, Digital mic equalizer, DSP VOX, Digital noise reduction, IF width control etc.

FT-2000 Buy Now Pay Later! 0% Interest!



1.8-30MHz
+6m 100W
£1695 D
FT-2000D 200W
£2399 D

FT-897D Buy Now Pay Later! 0% Interest!

* HF + 6m, 2m, 70cm
* CW, SSB, AM, FMN, FMW, PACKET, DIGITAL
* HF/6m 100W, 2m 50W, 70cm 20W

£599 D



FT-857D Buy Now Pay Later! 0% Interest!

* Tx: 160-6m(100W), 2m(50W), 70cm(20W)
* USB, LSB, CW, AM, FM, (WFM Receive)

£499 D



FT-DX9000D Buy Now Pay Later! 0% Interest!



FT DX-9000D £7,299 D
FT DX 9000MP £8,299 D
FT DX-9000 Contest £3,799 D

IC-7800

Low interest credit available
200W HF built-in PSU
FREE SP-120 Filter Speaker
Icom's greatest HF transceiver ever. Invest in the best! **£5400 D**



NEW PRODUCTS - NEW PRODUCTS

KENWOOD 0% Interest!

TM-V71E

EchoLink Memories & NODE Terminal
50W on 2m & 70cms!

£269 D



NEW Bluetooth

New 2m/70cm Mobile with Bluetooth option
50W 2m 40W 70cms
Removeable front
Built-in PTT & Microphone!
11 x 3.7 x 17 cm!

£249 D



FT-817ND Buy Now Pay Later! 0% Interest!



* TX: 160-10m, 6m, 2m, 70cm
* USB, LSB, CW, AM, FM, WFM, Digital (AFSK), Packet (1200/9600 FM)

£349 D

LOW PRICE!

ICOM IC-7700

Billed as a Contest Radio, the design takes features from the IC-758 and IC-7800 to give you a hefty transceiver packed with features. Available towards end of the year.



160m - 6m 200W
SSB CW AM FM
+40dBm Intercept
7" Colour TFT
Spectrum Scope

£tba

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

Freephone Orderline



08000 73 73 88

Online Catalogue



www.wsplc.com

UK's
Lowest
Prices



Zero Deposit
Zero Interest

KENWOOD TS-2000 Buy Now Pay Later! 0% Interest!



**100W All-mode
160m - 70cms
Duplex operation
Satellite ready
DX cluster QSY**

£1295 D

Quote advert when ordering to get **FREE** extra DC lead.
TS-2000X with 23cms **£1739**



TS-480SAT
100W HF+6m

£679 D

FREE

Delivery on
TS-2000 & TS-480
to PW readers -
ends 30/11/07

The TS-2000 is a great radio and offers all-band coverage in one very neat and very effective high performance system. This is one of the best buys in ham radio. Just add our W-25AM 13.8v supply (£89.95) and you are ready to go.

IC-756PROIII Buy Now Pay Later! 0% Interest!



HF + 6m
100W
All-Mode

£1995 D

IC-7000 Buy Now Pay Later! 0% Interest!



HF/VHF/UHF
All-Mode
Transceiver

£899 D

With TFT PAL TV screen **£989 D**
With TFT + Power-Mite PSU **£1009 D**

IC-7400 Buy Now Pay Later! 0% Interest!



100W HF-VHF

£PHONE

FREE SP-21 speaker & SM-20 Base Mic!

IC-718 Buy Now Pay Later! 0% Interest!



100W HF
Transceiver

£439.95 D

IC-706 Buy Now Pay Later! 0% Interest!



HF/VHF/UHF
100W
Transceiver

£PHONE

Includes Travel Mite Dual Voltage PSU

IC-703 Buy Now Pay Later! 0% Interest!



10W QRP
HF-6m built-in
Auto ATU

£449.95 D

Visit our eBay shop for more bargains!

eBay

Go to www.wsplc.com then click on the link to our eBay shop

Exclusive to Waters & Stanton!

NEW RADIOMATE

For **YAESU**



**Keyboard
For FT-817,
FT-857 & FT-897**

Rig not included

- Direct frequency entry
- Mode change
- Carrier tune mode
- VFO A/B
- 20 Memories
- Self-Powered

£99.95 C

bhi DSP Noise Cancelling

bhi NES10-2 MkII SPECIAL OFFER!



Speaker and programmable DSP unit. Offers dramatic noise reduction.

Was **£99.95** Now **£89.95 C**

bhi ANEM

"Noise Away" Amplified Noise Elimination Module. Fits in-line between the equipment & speaker.



£119.95 C

bhi NEIM-1031

Noise Eliminating In-Line Module.



£129.95 C

bhi NEDSP-1061-KBD

Noise Eliminating DSP module designed for retro-fit in a number of transceivers, FT-817, TS-50, IC-706MkII, FRG-100, DX-77. With Keyboard.



£89.95 C

bhi NEDSP-1062-KBD

Noise Eliminating DSP module simply fits into Loudspeaker path, features a small keyboard to control functions.



£99.95 C

Icom VHF/UHF Mobile/Base

ICOM IC-E208

VHF/UHF FM Dual Band Mobile Transceiver



*Freq range 144-146MHz, 430-440MHz Tx
*55/50W (3 pwr steps each band)
*Wideband Rx 118-173, 230-549 & 810-999MHz

£219.95 D

IC-910H

2m / 70cm 100W Base station all - modes
Option for 23cm module (UX-910 **£359**)

£1089 D

IC-910X

As above but with 23cm module ready fitted and a big saving as well.

£1239 D

IC-2200H

2m 55W FM mobile with rugged construction and with digital option.

£179.95 D

IC-2725E

2m / 70cm radio. Easy to operate and install and a lovely detachable head.

£279.95 D

Kenwood VHF/UHF Mobile/Base

KENWOOD TM-271E

2m FM 60W Mobile Transceiver. MIL-SPEC DTMF Mic.

Built-in CTCSS & DCS encoder / decoder.

Now Low Price! £149 D

Yaesu VHF/UHF Mobile/Base

YAESU FT-7800E

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



YSK-7800 Remote Cable Only **£24.95**

£169 D

FT-1802E Low Price! £99 D

*2m FM Mobile Transceiver *5, 10, 25 50W
*DTMF Mic Supplied as standard

FT-8800E Low Price! £219 D

*2m/70cm Dualband FM Mobile transceiver
*50W 2m, 35W 70cm *Wideband receiver

FT-8900R Low Price! £249 D

*2m, 70cm, 6m & 10m Quadband FM Mobile transceiver *Independent dial for each band

Yaesu ADMS Software

Programming Software For Your Radio
Programme Memories and all your radio's functions from your PC. Includes XP software, serial lead and adaptor for your Radio.

ADMS-1F for VX-110/1 / ADMS-1G for VX-7
ADMS-1H for VX-2E / ADMS-1J for FT-60E
ADMS-2H for FT-8900 / ADMS-2I for FT-8800 / ADMS-2J for FT-2800 / ADMS-2K for FT-7800 / ADMS-3 Programming Kit for VR-500, **£39.95** with FREE Data Lead.
ADMS-4A for FT-817 and ADMS-4B for FT-857/8 both **£29.95**, both these items require a separate CT-62 lead at **£29.95**

Ham Radio Weather Stations

NEW



**PEET Bros.
Desk Top
Designs**

Ultimeter-100 £119.95 C
• Wind speed • Wind direction • Outside temperature • Wind chill factor • Date and time • Highs and lows • Long-term memory data

Ultimeter-800 £159.95 C

This is the next model up and adds
• Humidity • Dew point option socket
• Indoor temperature • Static protection
• Illuminated keys • Blue LCD backlight.

Ultimeter-2100 £219.95 C

The top model adds to the Ultimeter-800
• Built-in pressure sensor
• Electrical output alarm trigger voltage

All 3 Models come with Free PC Software and data cable.

Icom VHF/UHF Handhelds

ICOM IC-E91

Latest dual-band handheld transceiver. receiver that covers 0.495 to 999MHz.



£239.95 C

IC-V82 7W 2m Digital £159.95 C

IC-U82 70cms Digital £159.95 C

IC-E90 6/2/70cm £199.95 C

IC-T3H 2m 5W £129.95 C

IC-E7 2m/70cm Wide Rx £169.95 C

Kenwood VHF/UHF Handhelds

KENWOOD TH-F7E

• 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!



£199.95 C

TH-K2E 2m 5W £99 C

TH-K2ET 2m 5W FM £145 C

TH-K4E 79cm 5W FM £139 C

Yaesu VHF/UHF Handhelds

YAESU VX-7R

LIMITED SPECIAL OFFER
Totally waterproof. Wide frequency coverage 500kHz-900MHz AM/FM.



£209 C

VX-6E 2m/70cm wide rx 5W £169 C

FT-60E 2m/70cm wide rx 5W £129 C

VX-120 2m 5W w/ 8-key pad £99 C

VX-170 2m 5W w/ 16-key pad £109 C

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

Enquiries 01702 206835 / 204965

WATERS & STANTON

Freephone Orderline



08000 73 73 88

General Enquiries



01702 206835
01702 204965

Online Catalogue



www.wspc.com

MFJ

SGC

HEIL

MFJ All UK stock now carries serial number & UK Warranty card

MFJ-929 £199.95 D

Compact IntelliTuner
Compact 200W
1.8-30MHz, Coax or
Random Wire Auto ATU



MFJ-927 £229.95 D

Remote IntelliTuner
Compact 200W
1.8-30MHz Auto ATU
with Power Injector



MFJ-976 £429.95 D

Balanced Line
ATU 1.8-30MHz
1500W Balanced
Line Antenna Tuner



MFJ-948 £109.95 C

1.8030MHz ATU
300W, large cross
needle meter



MFJ-993B £189.95 C

Auto ATU
1.8-30MHz,
300W SSB,
150W CW, Matches 6-800 Ohms



MFJ-945E £89.95 C

Mobile ATU 1.8-
54MHz, 300W
max, VSWR &
30/300W pwr meter



MFJ-949E £124.95 C

ATU / Dummy
Load 1.8-
30MHz, 300W,
large cross needle meter



MFJ-901B £74.95 C

VERSATUNER
1.8-30MHz, 200W,
135x150x60mm,
weight 760g



MFJ-902 £65.95 C

Travel Tuner 3.5-
30MHz, 150W,
Mobile & portable
use, 90x60x80mm



MFJ-259B £199.95 C

HF Digital SWR
Analyser Coverage:
1.8-170MHz, Freq Counter,
SWR & Impedance meters,
Connectors: SO-239 (Ant),
BNC (Counter).



MFJ-269 £269.95 C

HF/VHF/UHF Analyser
Coverage: 1.8-4, 4-10,
10-27, 27-70, 70-114, 114-
170, 415-450MHz. Freq
Counter, SWR &
Impedance meters,
Connectors: N-socket
(Ant), BNC (Counter).



SGC

SG-231 £349.95 D

SmartTuner
1.8 to 60MHz,
3 - 100W (PEP)
VSWR: <1.4:1 typical



SG-237 £269.95 D

Compact ATU
1.8 to 60MHz, 3 -
100W (PEP) 40W max
CW, VSWR: <1.4:1



SG-239 £189.95 D

Mini SmartTuner
1.8 - 30MHz, 1.5 -
200W (PEP) VSWR:
Typically less than 2:1



SG-230 £339.95 D

The Original Long
Wire SmartTuner -
1.6 - 30MHz, Power
Input 3 - 200W



HEIL

PR-780-PTT £159.95 C

Deluxe Base
Microphone
Dynamic cardioid studio
mic w/ CB-1PTT base
(needs CC-1-XLR) lead.



HC-4 £29.95 A

Dx Quality Mic Insert
Response from 500Hz to
3.5kHz with a 10dB mid-
range peak.



HC-5 £29.95 A

Normal Quality Mic
Insert Response from
350Hz to 4kHz with a
6dB mid-range peak.



HTSS £49.95 C

Traveler Single Side
Headset & Boom Mic
Requires HSTA patch
lead



HTDS £59.95 C

Traveler Double Sided
Headset & Boom Mic
Requires HSTA patch
lead



HSTA £17.95 A

Patch Leads for HTSS & HTDS.
HSTA-YM for Yaesu modular
HSTA-706 for Icom modular
HSTA-KM for Kenwood modular
HSTA-K8 for Kenwood 8-pin
HSTA-IC8 for Icom 8-pin
HSTA-KHT for Kenwood
HSTA-IHT for Icom handhelds
HSTA-VX for Yaesu handhelds



Power Supplies

WATSON

POWER-MITE

- 11-15V Variable.
- 20A continuous
- 23A peak, 100 - 260V
- AC in, 2 x Meters
- 150 x 55 x 165 mm



£49.95 C

W-3A £22.95 C

Output 3A, 13.8V DC, supply 230V AC

W-5A £29.95 C

Output 5A, 13.8V DC, supply 230V AC

W-10AM £59.95 D

Output 10A, 0-15V DC, supply 230V AC

W-25AM £89.95 D

Output 25A, 0-15V DC, Dual meters

W-25XM £99.95 C

Output 25A, 9.7-17V DC, Dual meters

W-30AM £119.95 D

Output 30A, 0-15V DC, Dual meters

W-25SM £79.95 C

Output 22A (25peak), 13.8V DC, supply 230V / 115V AC

DIAMOND

ANTENNA



GSV-3000

• Output voltage: 1 - 15V DC

• Output current 30A continuous *Built-in cooling fan

• Supply 230V AC 50Hz *Size 250 x 150 x 240mm

• Weight 5kg



£149.95 D

GZV-2500 £119.95 D

Output 25A, 5-15V DC, supply 230V AC Switch mode
over volts protected. 21 x 11 x 22cm

GZV-4000 £159.95 D

Output 40A, 5-15V DC, supply 230V AC Switch mode
over volts protected. 21 x 11 x 30cm

GZV-6000 £299.95 D

Output 60A, 1-15V DC, supply 230V AC Switch mode
over volts protected. 21 x 11 x 36cm

MANSON

EP-925

A general purpose 3-15V DC,
25A (30A peak) power supply
able to provide the needs of
the modern 100W HF
transceiver.



£99.95 D

HF Antenna's



CUSHCRAFT

COMMUNICATIONS ANTENNAS

MA5V £239.95 D

Vertical 5-band 20m - 10m. No separate radials
needed. 250W. Self-supporting. 4.48m tall.

A3-S £469.95 D

The classic 20 15 10m 3-el beam. 2kW 8dB gain.
8.45 el. Turn radius 4.72m. F/B ratio 25dB.

A3-WS £379.95 D

Dual Band 3 el beam for 17m & 12m. 2kW. El length
7.66m. Turn radius 4.4m. Gain 8dB. F/B ratio 25dB.

A4-S £569.95 D

Tri-band 4 element Yagi. for 20m - 10m. DXers delight.
2kW - 8.9dB gain F/B 25dB. Turn radius 5.49m

R-8 £469.95 D

8-band vertical 40m - 6m. No separate radials
needed. 1.5kW. Height 8.7m

R-6000 £329.95 D

6-band vertical 20m - 6m. No separate radials need-
ed. 1.5kW. Height 5.8m. Great small garden ant.

MA5B £399.95 D

5-band 2 El mini beam. 20m
- 10m 2kW. Elements 5.2m
Turn radius 2.7m. (Dipole
on 17/12m) 5dB gain

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November 2007

On Sale 11 October
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(December 2007 Issue on sale 8 November)

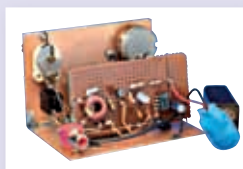
58 Practically Yours
75 Years of Heritage & History
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Cover Subject
This month, a classic from Heathkit, the 'Hartley Receiver' and also, don't miss Practically Yours – 75 years of Heritage & History, covering pre-PW radio publications from the early days of hobby radio.

Design: Steve Hunt

Maun Photograph: Phil Cadnam G4JCP

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Keylines

Rob G3XFD looks back at the Leicester Show and says a fond 'goodbye' to G7TZB.



Since the convenient and pleasantly located Picketts Lock venue in London was lost to Amateur Radio shows, due to the voracious appetite for land of the commercially corrupted Olympic Games, the Donington Castle based **Leicester Amateur Radio Show** (LARS) has taken on the burden of being the only 'big' indoor show in the UK. And what a difficult time the LARS is having!

I was most upset when the area around Picketts Lock came under the gaze of the Olympics organisers I (rather presumptuously perhaps) seriously thought about trying to talk to **Lord Coe**, the former athlete **Sebastian Coe**, who is now a Member of the House of Lords and the 'front man' for the event, to try and put to him the point of view of those who think the Olympic Games should return to their honourable, non-commercial roots (as depicted in the inspirational film *Chariots of Fire*) and find a permanent home in Olympia, Greece.

With a permanent home the games would not be forever causing havoc in different countries, turn-by-turn, as the inevitable, increasingly more expensive building spree develops – at huge costs to everyone, not just sporting enthusiasts. But, of course, I didn't bother. Instead, I make my personal (truly futile) protest by boycotting the National Lottery's 'Dream Number' game, which is designed to fund The Lord Coe's Olympic quest.

Convenient Venue

At first sight, the Donington Park venue should be convenient for more Radio Amateurs to visit than Picketts Lock. For most UK residents – any venue as far south as London is very likely to be inconvenient. After all, the centre of England, indeed the

UK, is much farther north than the Watford Bypass!

Unfortunately, despite the best efforts of the LARS organisers, the Donington Park venue seems to be run in a very incompetent fashion, although I understand it has recently changed hands. However, despite the fact that new owners have only just taken over, the sheer lack of effort and professionalism in attempting to control the heavy traffic flow to and from the event is – in my opinion – truly staggering. It's worth mentioning that I have tried to telephone (and E-mail) the Castle Donington owners to discuss the problems, but they seem unable to reply or answer my calls, while the E-mail system just 'bounced' – an easy way to keep complaints away!

It's too easy to blame the LARS organisers! Surely, the owners of the site should never try to arrange the hire of the gloomy, windowless (and airless) warehouse building out at the same time as a major motor racing event?

I hope that the LARS organisers – together with the people behind the other Donington Exhibition Centre events – get together to bring to the owner's attention, to the fact it has become a by-word for appallingly high noise levels, bad traffic and poor general management, combined with unhelpful staff. As a force, Amateur Radio may not seem much by itself – but when combined with other users' opinions something could be achieved – after all, the owners need our money to make a profit.

Something has to be done, **Amateur Radio needs the LARS – I feel it's vitally important** – but we do need a better deal for everyone involved. Hopefully, in 2008 I shall once again have queues of readers – waiting to chat to the *PW* Editor. Let's hope that the owners of the venue make it

possible for our visitors to arrive. I'm sure they can only do better than this year's fiasco!

Operating GB75PW At Leicester

Everyone on *PW* is very grateful for the use of the wonderfully equipped mobile shack (a former mobile dental surgery, complete with wheelchair lift!) belonging to the **Melton Mowbray Amateur Radio Society** (MMARS), which was willingly given over to operating GB75PW for the two days of the show. The entire MMARS team were extremely kind and helpful when – only a week or so before the show and literally out of the blue – the request to take over their long established operations came from a harassed Editor!

My thanks, on behalf of everyone at *PW* Publishing Ltd., go to the MMARS for their enthusiastic and dynamic assistance. In particular, the club made **Jim Lee G4AEH** (taking a two day break from his work on BBC Radio 4 and 7 to work on GB75PW!) very welcome indeed. I'm very grateful indeed to Jim and the other operators. It was, thanks to the Icom IC-756PROIII and the extensive antenna systems provided by the MMARS, possible to work Dave VK2SSH, one of our Australian readers. It was great effort everyone!

Goodbye To G7TZB!

After a total of 15 years working on *PW* (and latterly, also on *RadioUser*), **Donna Vincent G7TZB** has left us to join the **Wilts & Dorset Bus Company's** Press Office team in Poole. Everyone here – especially **Tex Swann G1TEX** and I – will miss her very much indeed. Good luck Toad!

Rob Mannion G3XFD/EI5IW

Subscriptions

Subscriptions are available at £37 per annum to UK addresses, £45 Europe Airmail and £55 RoW Airmail. See the Subscriptions page for full details.

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 the Book Store page 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 0845 803 1979. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full

details to Broadstone 01202 659950. The E-mail address is bookstore@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.

Services

letters

Send your moans, groans and even praise when it's due to the editorial address or

E-mail:

pwletters@pwpublishing.ltd.uk

A great deal of correspondence intended for 'letters' now arrives via E-mail, and although there's no problem in general, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please include your full postal address and call sign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'. **Editor**

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

Science & Education

Dear Rob

I read with interest the letter in the October 2007 *PW*, from the anonymous teacher. I agree completely with him and in fact, wrote an article for *Mensa Magazine*, which was published in the July 2007 issue.

My letter to the magazine basically says that the media is run by arts graduates, who do not understand science, therefore the papers and the broadcast media produce far more arts programmes than science programmes, because that's what they like. Thus fewer people are interested in science, don't choose the option at school, and don't leave school with scientific qualifications. They don't enter University to study science, therefore the number of science teachers drops, and the cycle continues. Plus, those who do choose a science-based education would rather enter industry or do post-graduate work than teach. This reinforces the cycle too.

I surveyed two issues of *The Daily Telegraph* in the Spring, and found roughly a 10:1 ratio of arts programmes to science programmes. The same week, I reviewed the terrestrial television programmes and Radio 4 (to include other terrestrial radio would have heavily skewed the answer towards music) and found a similar proportion. I wrote to the BBC Trust on these lines, and they confirmed to me that of 130 places in which they advertise jobs, fully 20% goes into *The Guardian* jobs pages. Is there any surprise that arts graduates abound in the media?

Geoff Theasby G8BML

Firth Park

Sheffield

South Yorkshire

Star Letter

not previously known and where is the confirmation of exchange in many of the 'QSOs' that seem to me to be acceptable between DXpeditions and the people hunting them?

3: I think that DXpeditions seem to bring out the worst in people. The poor quality, wide signals, and badly organised elements of our hobby seem to be attracted to DXpeditions. Some people call on the wrong frequency, only to be shouted at by others who are themselves shouted at by others and so on. This usually takes place right on top of where the DXpedition is, or was, or the place where the DXpedition might have been listening!

I could go on, and I'm sure others will, but I really do struggle at times to understand why we put up with this invasion of the bands, yet no one wants to use them when no DXpedition is about! Regards to everyone at *PW*.

Dave Ackrill G0DJA

Bolsover

Derbyshire

Are DXpeditions The Scourge of the Bands?

Dear Rob

I've read the various for and against arguments about contests in the letters pages of *Practical Wireless* and I wonder if it would be worth considering another possible scourge of the bands – the DXpedition? Now, I will admit, up front, that most of my problem with these activities is the fact that they seem to hog many of the bands, they bring out the worst in operating techniques and the radiated signals from some of the stations who are chasing them leave a lot to be desired (not the fault of the DXpedition, per se) but they do have to accept some responsibility for the fact that, were they not there, the poor signals and poor operating practices would not follow them.

My main gripes about DXpeditions fall into the following categories.

1: While recognising the dedication, cost and, in some cases, personal risk that the people operating the station have to suffer, not to mention the political negotiations

to allow operation on some bands with certain power levels and on various modes, I have to ask the question "what are they proving?"

If they prove that, if you take big antennas, large masts and use large amplifiers you'll be heard in almost any part of the world because people want to hear you – so, what do we know now that we did not know before?

2: If the object is just to provide another DXCC country for people who want to work that country, what is the minimum requirement for a contact? I've listened and watched 'contacts' with various DXpeditions on various modes over the years and, to be honest, after my involvement with v.h.f. and u.h.f. using modes such as Aurora, Meteor Scatter and seeing what hoops the Moon bounce people put themselves through, the standard 'QSO' with a DXpedition seems, to me, to fall far short of the minimum requirement.

Where is the exchange of call signs, where is the exchange of information that's

Dave's letter is on a topic that has not been featured in the letters section of PW beforehand. And, of course, as part of the ethical journalistic stance in PW – other readers are welcome to express their opinions! Please join me on the Topical Talk page (81) for further discussion. Editor.

The F. J. Camm Book

Dear Rob

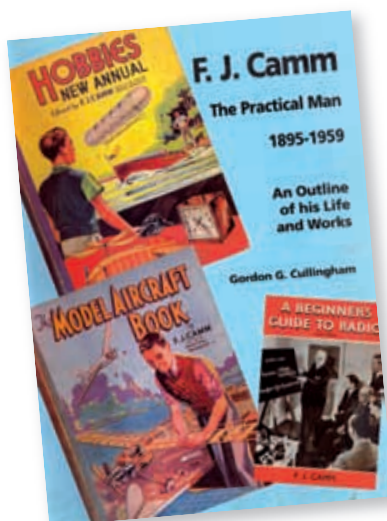
Thank you for your E-mail advising me that the booklet *F J Camm – The Practical Man* is now being re-published by the **Radio Society of Great Britain**, and not by PW Publishing Ltd., as you were intending.

During your negotiations with those involved you kept us (the group of readers waiting for the book to be re-published) fully informed and I – for one – really appreciated what you were doing on our behalf to make the book that tells us much about the founding Editor of 'our' magazine available once again.

Like you, I have lost several copies of the book after loaning them to other people

to read. However, unlike you I've never received mine back! And as I understood – when we met at the Leicester Show – you are now selling the booklet again, I was first in first in the queue at the PW Publishing Ltd, stand! Thanks for all your efforts on our behalf, I know that you had been trying hard to arrange the new edition of the booklet for some years.

Mike Harding
Stockton-on-Tees



It was good to chat to you at the LARS show Mike and I was rather flattered to sign your booklet – let's hope it's not devalued with my signature! Rob G3XFD.

Rallies & Events In PW

Dear Rob

Despite the terrible noise from Renault racing cars – it was great to be able to have a long chat with you at the Leicester Show this year. Normally there's a long line of readers waiting to have a chat but this time I took full advantage to make some suggestions.

As you know from our E-mail correspondence since we met at the show, I'm moving with my job from Sheffield to the south Midlands and hope to find a club in the area when we've settled. Of the many things we chatted about, you were keen to explain to me the plans for extended coverage of club news, rallies and other social events in the Amateur Radio calendar. I had, perhaps unfairly, criticised the small print and generally tiny news items on clubs and rally events in *PW*. I now know that you are aware of the problems for us who are visually

challenged and at the bifocal lens stage of our lives!

Most of my hobby radio activities, on the social side anyway, mean that I am to be found attending most of the rallies I can get to from my home in Sheffield, including the Barnsley rally and others like it in the area. Now that my job is relocating I will find all the information on clubs and rallies even more important as I find my feet in my new area.

I think that the plans, as you described them, will help everyone in the hobby. I've enjoyed the *In Focus* articles that have been produced already and I understand this is to be major feature available to clubs in future. I would also much appreciate maps, photographs of previous events (so I can get an idea of what's in store) and full directions to rallies, along with any other information that could help me enjoy the visits. My wife will always come with me to a rally – **if she knows there will be something to interest her!** Very best wishes and I hope *PW* has many more years of success, it deserves more years because the staff are prepared to listen to their readers!

Steve Machin
Sheffield
South Yorkshire

I also enjoyed the chat Steve and I'm very grateful for the suggestions and ideas you provided, which seemed to be much in line with what we were planning for PW in the future! I hope your move to the south Midlands goes well and that you are soon settled in to your new home. I now invite readers to join me on the Topical Talk pages (81) where, in line with what I was discussing with Steve at the LARS, there's an important announcement regarding the future of the special In Focus feature for clubs, the club news section, rallies and events in PW. Rob G3XFD.

Variety of Topics On GB75PW

Dear Rob

As I'm only a listener, I have been unable to call in whenever GB75PW has been on the air. Despite this I have been able to follow the 75th anniversary Special Event station on its travels as you take it to various sites in the UK. On the occasions you have been supported by other operators it has been interesting to hear the differing topics that can arise with the individual operating the station and I'm so pleased you avoid the 'rubber stamp' type of QSO. In fact, I found that **Jim Lee G4AEH** – operating from the **Melton Mowbray Club's** mobile shack at the Leicester Show to be very enjoyable. Jim's professional BBC Radio 4



announcer's voice was very enjoyable to listen to and I was made welcome on my brief visit to the caravan, even though Jim was too busy on the Icom IC-756PROIII's microphone to chat to the audience.

Normally, I hear you on 7MHz and the topics you chat about to *PW* readers as you work them – are truly fascinating. As I and most of your readers know – you have an abiding interest in railways and transport history, together with a deep love of travel and geography. Many of us also share your interests and I'm a keen model engineering type although, I must confess that I've never been able to build one of the beautifully crafted miniature locomotives that you were discussing when you were operating from the Worcester Club earlier in the year!

The main reason for writing to you is because I think the marvellous promotional idea behind GB75PW during the anniversary year has clearly demonstrated just how much we all have in common. Perhaps it's time that the Amateur Radio hobby could link up with model engineering and other technical hobbies? I suggest this because whenever I go to special track open days when guest locomotives are running on club circuits – there's always a least one of two Amateur Radio equipped cars to be seen nearby. As I've said, we all seem to have much in common – so do you think we could forge links between the model engineers and Amateur Radio? I think it could be an interesting alloy (amalgamation?) of two technical subjects! In closing this letter to you I must say that – as keen as I am on radio – up until now the model engineering side has kept me occupied for many years, hence the fact I still prefer my listening activities as I work on my bench and lathe. But that doesn't mean I won't go for my licence, especially as I have now retired!

George Newson
Scunthorpe
North Lincolnshire

Thanks for your letter George and remember – listeners are very important to the hobby! By an amazing coincidence, Elaine Richards G4LFM (who, I'm pleased to say, has re-joined the PW Editorial team) has included a fascinating story featuring a miniature steam locomotive – and its M3 driver – in the news this month. I have also been invited to visit the Amateur Radio

Club (*Weston-Super-Mare*), which seems to share many members with the model engineering society featured! I agree with your suggestions and I hope that we'll be able to feature some special news stories* in the coming months where Amateur Radio and engineering societies have 'come together' to share meetings and expertise. Please keep Elaine G4LFM fully informed of your activities. Rob G3XFD.

* elaine@pwpublishing.ltd.uk

Club Visits & Book Sales

Dear Rob

As a visitor to the Worcester club earlier in the year, I enjoyed your talk to the club. I wasn't able to be present while you were operating GB75PW, but the evenings presentation on PW was truly enlightening! But on to business because I'm actually writing to ask that – perhaps – you could bring some of the PW Book Store stock to club visits, thus saving postage for your readers?

I managed to buy my copy of the F J Camm book at the Leicester Show but I think that would also be a popular buy for your readers during club visits.

Best wishes – it was good to see both yourself and **Tex G1TEX** at the show this year and I hope to see you there again in 2008.

Mike Gooding
Stourport-on-Severn
Worcestershire

I'm planning to bring small numbers of the Camm book during club visits Mike and I'll be more than pleased to bring pre-ordered books with me by arrangement. However, due to the logistics, the heavy archive collection and the hectic schedules, I think it would be quite difficult to bring a selection of other books with me during the very busy club visits, despite this I'll try to help readers whenever I can. Rob G3XFD.

Great CDROM!

Dear PW team,

I'm writing to say 'thank you' for the great CDROM you have produced for PW readers. Because of the postal troubles my order went astray and I am very grateful for the help received when I telephoned the office. Within a few days of the call my CDROM arrived and I was thoroughly enjoying the beautifully presented contents. Thank you again PW!

Robert Anderson
Dundee
Scotland

The success of the CDROM project was due to Tex G1TEX's expertise in preparing it and our efficient post sales department Robert. They deserve the applause! Rob G3XFD.

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 13th

GB3EE Repeater Group Rally

Website: <http://gb3ee.com>

The GB3EE Repeater Group Rally will be held at the Calow Community Centre, All Pits Road, Calow, Chesterfield S44 5AT. Doors will be open from 10am to 4pm.

October 14th

Great Lumley AR & ES Rally

Contact: Nancy Bone G7UUR

Tel: 0191 477 0036

E-mail: nancybone2001@yahoo.co.uk

The Great Lumley Amateur Radio & Electronics Society is holding its rally in the Great Lumley Community Centre, Front Street, Great Lumley DH3 4JD. Doors open 10.30am. There is free parking and easy access, refreshments and admission is £2. The rally will include radio, electronics and computer traders, Bring & Buy and talk-in.

October 21st:

Blackwood and District ARS Rally

Contact: Dave

Tel: 01495 228516

E-mail: ddlewhbk@btinternet.com

Website: www.gw6gw.co.uk

The Blackwood and District ARS Rally will take place at Coleg Gwent, Risca Road, Crosskeys NP11 7ZA. Doors open 10am for disabled visitors and 10.30am for other visitors. There will be traders, a Bring & Buy, special interest groups and plenty of parking. Admission is £2.

October 28th

Galashiels & District ARS Radio and Computer Rally

Contact: Jim

Tel: (01896) 850245

E-mail: gm7lun@qsl.net

The Galashiels & District ARS Radio and Computer Rally will be held at Volunteer Hall, St John's Street, Galashiels TD1 3JK. There will be trade stands, a Bring & Buy and catering. Doors open at 11am and admission is £2.

November 3rd

RAYNET Convention and AGM

Website: www.raynet-uk.net

The RAYNET Convention and AGM will be held at the East Sussex Fire and Rescue HQ, Eastbourne.

November 4th

16th Great Northern Hamfest

Contact: Ernie

Tel: (01226) 716339 (6 to 8pm)

The South Yorkshire Repeater Group will be holding the 16th Great Northern Hamfest in the Metrodome Leisure Complex, Queens Road, Barnsley, South Yorkshire S71 1AN. Doors open at 11.00am for all. It will feature all the usual trade stands, component and specialist interest groups and a large Bring & Buy, plus tables allocated at a small charge to radio amateurs to sell their own equipment.

December 2nd

Red Rose Winter Rally

Contact: Steve

Tel: (01942) 888900

Website: www.wmrc.org.uk

The West Manchester Radio Club is holding its Red Rose Winter Rally at Lowton Civic Centre, Hesketh Meadow Lane, Lowton WA3 2AH, just off the A580 East Lancs Road. This venue is all on one level, with disabled facilities and free parking. There will be a Bring & Buy, RSGB bookstall, usual trade stands, component and special interest groups, licensed bar, catering and large social area. Doors open at 10am.

December 2nd

Bishop Auckland RAC Rally

Contact: Mark G0GFG

Tel: (01388) 745353

The Bishop Auckland Radio Amateurs Club Rally will be held at Spennymoor Leisure Centre, High Street, Spennymoor, Co Durham DL16 6DB. There will be radio, computer and electronics traders as

well as a Bring & Buy. The site has refreshments and bar facilities. There will be plenty of car parking and admission is £1.50.

January 27th

Horncastle Winter Rally

Contact: Tony Nightingale

Tel: (01507) 527835

E-mail: G3ZPU@hotmail.com

The Horncastle Winter Rally will be held at the Horncastle Youth Centre, Willow Row, Horncastle LN9 6DZ. Tables cost £5 and entry for visitors is £1. The venue is all on one level, making access easier for disabled visitors. Usual refreshments will be available, including hot-bacon-butties. Doors open 10.30am.

February 3rd

RadioActive Rally

Contact: Roger Reeves M0ROJ

Tel: (01829) 771440

E-mail: info@RadioActiveShow.co.uk

Website: www.RadioActiveShow.co.uk

The RadioActive Rally will be held at Civic Hall, Nantwich Town Centre, Cheshire CW5 5DG. Doors will open at 10.30am and admission will be £3 (under 16 free). There will be over 100 trade stands and covered flea market, a Bring & Buy, Special Interest Groups, talks and demonstrations, a licensed bar and restaurant and disabled Facilities.

South Essex ARS Rally

Contact: Ken G0BBN

Tel: (01842) 861089

E-mail: Hendryken@aol.com

The South Essex Amateur Radio Society Rally will be held at 'Paddocks', Long Road, Canvey Island, Essex SS8 0JA. There will be free car parking with a disabled persons area at the front. Admission is £2 and doors open at 10.30am. There will be trade and club stands, home made catering and a 'Rent-a table' option for private sellers (£3.50/hr)

March 9th

8th Junction 28 QRP Rally

Contact: Mark Vardy 2E0IQO

Tel: 079769677221

The 8th Junction 28 QRP Rally will be held at Alfreton Leisure Centre, Church Street, Alfreton, Derbyshire DE55 7BD. Doors open 10am and there will be better on-site car parking. There will be Amateur Radio and electronics traders as well as a Bring & Buy, Special Interest Groups and refreshments.

May 4th

3rd Dambusters Hamfest

Contact: Tony Nightingale

Tel: (01507) 527835

E-mail: G3ZPU@hotmail.com

The third Dambusters Hamfest will be held at Thorpe Camp Museum, Nr Coningsby, Lincolnshire LN4 4PE (the 617 Dambusters Squadron base). Free pitches are available for traders and entry is £2 per person, which includes entry into the museum. There are no inside pitches but traders can bring their own tents, gazebos or marquees at no extra cost. Please book these in advance. The NAFFI will be open for hot drinks and home made cakes. Doors open for visitors at 10.30am.

July 27th

Horncastle Summer Rally

Contact: Tony Nightingale

Tel: (01507) 527835

E-mail: G3ZPU@hotmail.com

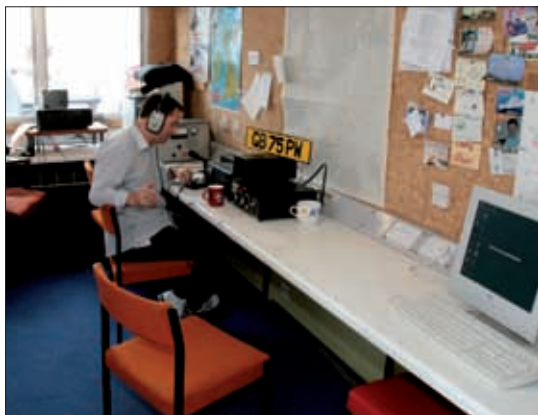
The Horncastle Summer Rally will be held at Horncastle Youth Centre, Willow Row, Horncastle LN9 6DZ. Tables cost £5 and entry for visitors is £1. The venue is all on one level, making access easier for disabled visitors. Usual refreshments will be available, including hot-bacon-butties. Doors open 10.30am.

news & products

Send all your news and club info
to **Elaine Richards G4LFM**
at the *PW* editorial offices
or E-mail:
elaine@pwpublishing.ltd.uk

Operating GB75PW at Donington Park

The GB75PW special event station is not the only special station **Jim Lee G4AEH** will be operating this year (he's an announcer on BBC R4 and 7!) but it's the only one he won't have to spend too much time explaining the significance of the callsign. Of the hundreds of stations worked from Donington, the vast majority knew exactly what *Practical Wireless* was all about. His best DX, **Dave VK2SSH** near Sydney, Australia turned out to be a regular reader and Jim discovered that *PW*'s fame had even spread to Russia. The warmth of the on-air welcome made for a very special couple of days, as did the friendliness of the **Melton Mowbray ARS** members who provided some excellent facilities. The only downside was trying to co-exist with some of the noisiest racing cars on the planet, which at times made it almost impossible to speak, never mind listen for stations!



Jamboree on the Air

Listen out for **GB50TYN**, a Scout JOTA station, which will be activated by members of the **Tynemouth Amateur Radio Club** during the weekend October 20th/21st at the 3rd Tynemouth Scout Headquarters. They want to have a very active weekend so they are requesting all stations to look for them on the bands. The station will be operational on h.f. and 144MHz (2m) using the modes c.w., s.s.b., and p.s.k. This is an exceptional 50th year for Scouts across the world, so the Tynemouth Amateur Radio Club want to make it a JOTA to remember.

Lighthouse on the Air

Members of **Norfolk Amateur Radio Club** spent the weekend of August 18th/19th operating from Happisburgh lighthouse on the Norfolk Coast. It was just one of the 350 or so international stations taking part in the Fifth Lighthouses/Lightships on the Air Weekend. Using callsign **GB0HL**, operators worked s.s.b.,



c.w., APRS and data modes, as well as v.h.f., conducting contacts throughout Europe with other lighthouses and many interested stations enquiring about the Lighthouse event. The radios used were an Icom IC-756 with an almost vertical Windom antenna plus a Kenwood v.h.f. rig to a collinear antenna mounted on the top of the lighthouse. Working from within the lighthouse itself was a unique experience in terms of acoustics and operating space.

Happisburgh Lighthouse is the only privately owned operational lighthouse in the country and it is maintained by the **Friends of Happisburgh Lighthouse charity**. It is painted in iconic red and white stripes and is still in use, protecting sailors from the off the shores sandbanks with its light reaching a distance of 18 miles. This lighthouse is sited slightly inland and surrounded by fields and, as they were operating, the smell of harvested peas was in the air rather than the expected salty tang associated with a lighthouse. The weekend was a great success and they have been asked to go back again to do it all again next year!

Re-usable Cable Ties

Portable operators will welcome these re-usable cable ties. The unique design of the head of the ties allows each tie to be used hundreds of times.

They're great for Summits On The Air (SOTA) and other types of portable operating. The 'quick release' feature makes these ties easy to remove for quick packing up. In fact, you can even use them with gloves on! The design of the head of the tie allows it to be opened or closed without threading. Costing £1.25 for 10 cable ties and £2.25 for 20, post & packing is 50p in both cases.



Full details at: <http://www.sotabeams.co.uk>

SOTA Beams, 89 Victoria Road, Macclesfield, Cheshire SK10 3JA.
Tel: 01625 425700.

Changes at BARTG

The **British Amateur Radio Teledata Group (BARTG)** has quietly undergone some changes during the past year. A new web site has been set up to enable BARTG to offer some extra facilities. Check out: www.bartg.org.uk

Datacom, BARTG's well-known magazine, has moved onto the new website so that news can reach BARTG's members as quickly as possible. This also eliminates the labour of packing and posting each issue.

Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ.
Tel: 0115 926 2360. E-mail: ian@bartg.demon.co.uk

Braintree Falklands Commemoration



The weekend of September 1st/2nd saw the **Braintree Radio Society** participate in the **Gosfield Scarecrow** trail for the second year running. This year they decided to 'call up' Roger Ham and make him a member of the Parachute Regiment and commemorate the 25th anniversary of the Falklands Campaign. Complete with his rifle, he had both short range, 'tactical' and longer range 'strategic' comms in the form of a v.h.f. manpack, an h.f. manpack and a rack mounted h.f. system complete with 100W linear, a.t.u. and audio filter and recording system. Communications security was ensured with the use of voice encryption equipment and, should propagation conditions get too bad, there was always his trusty Morse key.

Over the course of the two days, Roger attracted great interest from members of the public. The Society had a couple of ex-Royal Signals members visit and chat and both stated that the set-up brought back many memories, which was quite satisfying, if only because it showed the authenticity was about right.

As last year, they ran a competition for the public who, for 50p, had to guess the distance of their longest contact to win a wind-up radio. By the end of Saturday they had already passed last year's total.

Collecting at the Leicester Radio Show

Gary G6NYH from the Northampton-based TETRA would like to thank all of the Amateurs who attended the Leicester Amateur Radio Show at Castle Donnington for their contributions to the MacMillan Cancer Fund. A total of £230 was collected.

A Call for Volunteers

The Radio Amateurs' Emergency Network (RAYNET), is the UK's national voluntary communications service provided for the community by licensed Radio Amateurs. The **Eastbourne and Wealden** RAYNET Group is setting out to get more fresh faces to sign up. It has one of the busiest event calendars in the country combined with an active engineering committee investigating various operating modes and automatic position reporting systems (APRS).

There is an acute need for new members of any age – preferably licensed, although s.w.l.s are also needed to assist in logging and other duties. Training events are carried out regularly and there is also a social aspect with radio treasure hunts, barbeques and similar activities dotted throughout the year. If you live in East Sussex or the Kent/West Sussex borders and would like to join, The Eastbourne and Wealden Group can be contacted via **Dick Jeffries**, dick.jeffries@raynet-uk.net or on **01323 845418**. If you'd like to learn more about RAYNET in general, visit www.raynet-uk.net where visitors can also find out about their local groups.

A Train Mobile Station?



Ricky M3UWJ, one of the younger members of the **Weston-Super-Mare Radio Society** can be seen driving this 5in Gauge model of a Dean Goods loco (and working '2m' mobile at the same time). It was at the 40th anniversary of the opening of the **West Huntspill Model Engineering Society** at their raised track near Highbridge, Somerset. The Weston-Super-Mare Radio Society had an exhibition tent and radio station operating. It was astounding how many Radio Amateurs had an interest in model engineering and vice versa.

If you are interested in either of these two Societies, you should contact **Graham Jones G4DPH** on (01934) 838298.

Can You Help?

Hugh Hereward, 15 High Street, Toller Porcorum, Dorchester, Dorset DT2 0DN, Tel: (01300) 320332, has *Wireless World* issues from 1956 to 1963 to give away to a good home. Please telephone to arrange a time.

Practical Wireless Tool Kit

Gavin Keegan G6DGK is looking to buy a *Practical Wireless* Tool Kit that was given to readers/subscribers free in the early 1930s. He says he would prefer a complete kit in good condition but will consider all offers and is prepared to pay a fair price for a kit. He also stresses that he's NOT a dealer.

If you have one for sale, or you know of where one is available, please contact Gavin with details at **'Hurstfields', Newick, East Sussex BN8 4NA**. Tel: 07801 692667.

Listen Out For:

Look for Syrian Amateurs using the special prefix 6C60 to celebrate the 60th anniversary of Amateur Radio in Syria during the period October 15th to November 15th on all h.f. bands.

The **Wirral and District Amateur Radio Club** will be active as **GB2JAM** for the 2007 JOTA (Jamboree on the Air), October 21st/22nd. Look for activity on all bands. QSL direct to **G4MGR, Uplands, 39 Pensby Road, Heswall, Wirral, Merseyside CH60 7RA** or via the bureau.

Special event station **8J1WALK** will be aired October 28th through November 4th to celebrate the 30th Japan 3-day March. QSL via the **JARL bureau, Shobara Post Office, Shimane 699-0588, Japan**.

Special event station **8J6HAM** will be aired October 28th through November 4th to celebrate the 7th Nishinohon (or West Japan) Ham Fair. QSL via the JARL bureau, Shobara Post Office, Shimane 699-0588, Japan.

Special event station **8N1420T** will be on the air between November 17th and December 9th to celebrate the 20th anniversary of Tsukuba-city. QSL via the JARL bureau, Shobara Post Office, Shimane 699-0588, Japan.

Around the World in 50 Hours

This year's Jamboree On The Air will have a theme; in 50 hours they will travel around the globe. This golden-jubilee JOTA is two hours longer: the 50th

JOTA will run from October 19th, 2200BST to October 21st midnight BST. During the JOTA weekend there

is, unfortunately, one contest. It is an exception to the agreement that there will be no contests during the JOTA weekend. However, an agreement has been reached with the organisers of this German WAG contest on the use of Amateur Radio frequencies during the 50th JOTA. The German contest stations will not operate in the following segments: 3650 - 3700kHz, 7080 - 7140kHz, 14100 - 14125 and 14280 - 14350kHz, 21350 - 21450kHz, 28225 - 28400kHz.

This leaves all World Scout Frequencies in the clear.



Noise Cancelling Headphones

We all know how important a good pair of headphones is to the Radio Amateur, finding peace in the noisy environments that surround us today can prove to be impossible. The ATH-ANC7 QuietPoint headphones from Audio Technica employ a miniature microphone in each earpiece to actively monitor what you are hearing, including the unwanted environmental noise; such as street sounds or the noise associated with a busy special event station.

The onboard electronics identify the difference between this and the 'undisturbed' signal from your listening source. This is used to create an anti-noise signal. By mixing this with the intended signal source the unwanted noise is cancelled out, allowing you to listen in conditions of near silence. The ANC7 headphones feature a closed-back, streamlined design that is extremely comfortable to wear over extended periods of use.

Costing £129.95, these headphones are available at:

<http://www.athheadphones.com/>



Revillagigedo DXpedition

Carlos **XE1YK**, the President of Mexico's Federación Mexicana de Radioexperimentadores (FMRE) has announced the dates for a Revillagigedo expedition to celebrate the 75th anniversary of FMRE. The operation will be between November 15th and December 15th. Callsigns **6E4LM** and **XF4YK** have been requested.

The operators will focus on 160 and 6m (1.8 and 50MHz) but they will be on the other h.f. bands as well with a goal of 25,000 QSOs. They plan to use simple antennas and 100 watt radios.

Icom Launch New D-STAR Website

To support and provide information on this exciting new development in Amateur Radio, Icom UK are setting up a new website (www.d-staruk.co.uk). The site will be a comprehensive guide to D-STAR matters.

There will be sections about the history, features and technical matters regarding D-STARs as well as several links to many successful forums that have already built up a wealth of information about setting up and running a D-STAR system. There will also be an Icom UK forum that they hope will have some lively debate and hopefully postings about D-STAR in the UK.

Icom (UK) Ltd, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 01227 741741
www.d-staruk.co.uk

New Licensees

Ofcom recently announced that over 200 new Foundation, Intermediate and Advanced licences were issued during August. This represents an increase of 133 Foundation Licences (9040), an increase of 34 Intermediate licences (3885) and an increase of 45 Full Licences (49,821).

club news

Keep your club news coming to pwnews@pwpublishing.ltd.uk and please remember to include full details of your club, E-mail and telephone contact details and the postcode of your meeting venue - it helps potential visitors to find you!

CHESHIRE

Chester & District Radio Society

Contact: Graham
Tel: (07930) 655 121
E-mail: info@chesterdars.org.uk
Website: www.chesterdars.org.uk

The Chester & District Radio Society meets on Tuesday evenings at the Burley Memorial Hall, Common Lane, Waverton, Chester CH3 7QT. October 16th is a talk on Tunnel Communications (Standedge Tunnel) by Eric Walton and Jock McEwan, 23rd is the Crystal Set Assessment Night with Alan Hopkinson and 30th is the C&DRS website update and demonstration by Graham Pemberton. All visitors will receive a warm welcome from members.

COUNTY DOWN

Bangor and District ARS

Contact: Mike G4XSF
Tel: 028 4277 2383
Website: <http://www.bdars.com>

Bangor and District Amateur Radio Society meets on the 1st Thursday of every month in 'The Boathouse', Harbour Car Park, Groomsport at 8pm. November 1st is the annual surplus sale. Visitors and new members are most welcome.

COUNTY DURHAM

Great Lumley AR&ES

Contact: Nancy Bone
Tel: 0191 477 0036
E-mail: nancybone2001@yahoo.co.uk
Website: www.glares.org.uk

Great Lumley Amateur Radio & Electronics Society meets in the Community Centre, Front Street, Great Lumley, Chester le Street, Co Durham DH3 4JD every Wednesday 7.30 to 9.30pm. October 24th is Software Defined Radio by Bill Gleave G8YWK and November 14th there is a talk, short video and demonstration of an Engima machine by Mike Stott G0NEE.

DERBYSHIRE

South Normanton Alfreton and District ARC

Contact: A J Highton
Tel: (01773) 783658
E-mail: snadarc@linuxmail.org
Website: www.snadarc.me.uk/

South Normanton Alfreton and District Amateur Radio Club meets in the Village Hall, Community Centre, Market Street, South Normanton, Derbyshire DE55 2EJ. October 15th is a Junk Sale, 22nd is a Fox Hunt (with a free fish & chip supper for those taking part!) and 29th is a talk by RAYNET.

EAST LoTHIAN

Cockenzie & Port Seton ARC

Contact: Bob Glasgow
Tel: (01875) 811723
E-mail: bob.gm4uyz@btinternet.com
Website: <http://www.cpsarc.com/news.php>
Cockenzie & Port Seton Amateur Radio Club meets in the Thorntree Inn (Lounge Bar), High Street, Cockenzie, East Lothian EH32 0HP from 7pm till late. Organised talks are held in the Port Seton Community Centre, South Seton Park, Port Seton, East Lothian EH32 0EE. October 19th is a video night and November 16th is Radiography by Colin GM0RLZ, both held at the Port Seton Community Centre Resources Room 2 from 7.30 to 9.30pm.

ESSEX

Chelmsford ARS

Contact: Martyn Medcalf G1EFL
Tel: (01245) 469008
E-mail: info2007@g0mwt.org.uk
Website: www.g0mwt.org.uk
The Chelmsford Amateur Radio Society meets on the first Tuesday of each month in the Marconi Sports & Social Centre, Beehive Lane, Great Baddow, Chelmsford CM2 9RX at 7.30pm. November 6th is a talk on The Changing Face of Amateur Radio.

HAMPSHIRE

Fareham & District ARC

Contact: Ken Sapsed
Tel: 023 9279 7240
E-mail: secretary@fareham-darc.co.uk
Website: www.fareham-darc.co.uk/
Fareham & District Amateur Radio Club meets on Wednesdays evenings from 7.30pm in the Portchester Community Centre, Westlands Grove, Portchester, Fareham PO16 9AD. October 31st is a Junk Sale and November 14th is a debate - do we need RSGB or OFCOM.

Horndean & District ARC

Contact: Stuart Swain
Tel: (02392) 472846
E-mail: g0fyx@msn.com
Website: www.hdarc.co.uk
Horndean & District Amateur Radio Club meets on the first and fourth Tuesdays each month in the Lovedean Village Hall, 160 Lovedean Lane, Lovedean, Hants PO8 9SF at 7.30pm. Visitors are always very welcome. October 23rd is the Annual General Meeting.

HUMBERSIDE

Hull & District ARS

Contact: Raymond Penny
Tel: (01482) 504618
E-mail: sirraymond@sirraymond.karoo.co.uk
Hull & District Amateur Radio Society meets every Friday at the Walton Leisure Centre, Walton Street, off Anlaby Road, Hull HU3 6JB.

LANCASHIRE

Oldham RC

Contact: Christopher Cunliffe G7OOD
E-mail: secretary@oarc.org.uk
Website: <http://www.oarc.org.uk/>
The Oldham Radio Club meets on Thursdays at No.1855 (Royton) Squadron Air Training Corps, Park Lane, Royton, Oldham at 7.30pm.

LONDON

Southgate ARC

Contact: Donald F Berry G4DFB
Tel: 020 8360 3614,
E-mail: dfberry@eggconnect.net
Website: www.southgatearc.org
The Southgate Amateur Radio Club meets on the 2nd Thursday of the month at Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill, London N21 3ER at 7.30pm. October 11th is a Junk Sale.

SHROPSHIRE

Telford & District ARS

Contact: Mike Street G3JKX
Tel: (01952) 299677
E-mail: mjstreetg3jxx@blueyonder.co.uk
Website: www.tdars.org
The Telford & District Amateur Radio Society meets on Wednesdays at the Community Centre, Bank Road, Dawley Bank, Telford, Shropshire TF4 2AZ at 8pm. October 17th is Nostalgia night, bring something old and interesting (*not* Grandmas/ Mothers-in-Law etc.)!

SOMERSET

Trowbridge & District ARC

Contact: Ian Carter
Tel: (01225) 864698
E-mail: ian.i.carter@btinternet.com
Website: <http://uk.geocities.com/tdarc@btinternet.com>
Trowbridge & District Amateur Radio Club meets at Southwick Village Hall, Southwick (nearest postcode is BA14 9QN). November 7th is the Constructors' Competition Entry Judging.

South Bristol ARC

Contact: Len Baker
Tel: (01275) 834282
E-mail: g4rzy@msn.com
Website: www.sbarc.co.uk
South Bristol Amateur Radio Club meets at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol BS14 0LN. November 7th is the Club Evening DX Challenge.

SOUTH GLOUCESTERSHIRE

Thornbury and South Gloucestershire ARC

Contact: Tony
Tel: (01454) 417048
E-mail: tonytsgarc@beeb.net
Website: <http://jma-databases.co.uk/tsgarc>
Thornbury and South Gloucestershire Amateur Radio Club meets in the United Reform Church Hall, on the corner of Chapel Street and Rock Street, Thornbury at 7.30 - 9.30pm.

TYNE & WEAR

Tynemouth ARC

Contact: Tony Regnart
E-mail: tony.regnart@gmail.com
Website: <http://www.gx0nwm.co.uk/>
Tynemouth Amateur Radio Club meets each Friday from 7 to 9pm at St. Hilda's Church, Stanton Rd, North Shields, Tyne & Wear NE29 9QB. It's known locally as 'the church near the fire station'. October 19th is Virtual Morse and a JOTA briefing by Glen G0SBN and November 2nd is The Huff Duff Loop by Ian M3IGB.

WORCESTERSHIRE

Worcester RAA

Contact: Daniel Thompson
E-mail: m3jtt@hotmail.co.uk
Website: <http://g0wxj.demon.co.uk/>
Worcester Radio Amateurs Association meets at the 3rd Worcester Scouts HQ, Vicar Street, Off Rainbow Hill, Worcester WR3 8EU.

Log Periodic

- MLP32**£119.95
 * Frequency:100-1300MHz TX & RX
 * Boom:142cm Long Element 150cm
 * Gain 11-13 dB
- MLP62**£199.95
 * Frequency:50-1300MHz TX & RX
 * Boom:200cm Long Element 300cm
 * Gain 10-12 dB



AM-Pro Mobile HF Whips (with 3/8 base fitting)

- AM-PRO 6 metre** (Length 4.6' approx).....£17.95
AM-PRO 10 metre (Length 7' approx).....£17.95
AM-PRO 17 metre (Length 7' approx).....£17.95
AM-PRO 20 metre (Length 7' approx).....£17.95
AM-PRO 40 metre (Length 7' approx).....£17.95
AM-PRO 80 metre (Length 7' approx).....£19.95
AM-PRO 160 metre (Length 7' approx).....£49.95
AM-PRO MB5 Multi band 10/15/20/40/80 can use 4 Bands at one time (Length 100").....£69.95

Slim Jims

- SJ-70** 430-430MHz slimline design with PL259 connection.
 Length 1.00m with N-TYPE socket.....£19.95
- SJ-2** 144-146MHz slimline design with PL259 connection.
 Length 2.00m with SO-239 socket.....£24.95



VHF/UHF Mobile Antennas

- MICRO MAG** Dual band 2/70 antenna complete with 1" magnetic mount 5mtrs of mini coax terminated in BNC.....£19.95
- MR700** 2m/70cm, 1/4 wave & 5/8, Gain 2m 0dB/3.0dB 70cm Length 20" 3/8 Fitting.....£7.95
- MR700S** PL259 Fitting.....£9.95
- MR 777** 2 Metre 70 cm 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (3/8 fitting).....£17.95
- MR 777S** (PL259 fitting).....£19.95
- MRQ525** 2m/70cm, 1/4 wave & 5/8, Gain 2m 0.5dB/3.2dB 70cm Length 17" PL259 fitting commercial quality.....£19.95
- MRQ500** 2m/70cm, 1/2 wave & 2x5/8, Gain 2m 3.2dB/5.8dB 70cm Length 38" PL259 fitting commercial quality.....£24.95
- MRQ750** 2m/70cm, 6/8 wave & 3x5/8, Gain 2m 5.5dB/8.0dB 70cm Length 60" PL259 fitting commercial quality.....£34.95
- MRQ800** 6/270cm 1/4 6/8 & 3 x 5/8, Gain 6m3.0dB/2m 5.0dB/70 7.5dB Length 60" PL259 fitting commercial quality.....£39.95
- GF151** Professional glass mount dual band antenna. Freq: 2/70 Gain: 2.9/4.3dB. Length: 31".....New low price £29.95



Mobile Speaker

- PMR-218** Small extension speaker.....£8.95
- PMR-250** Medium extension speaker.....£10.95
- PMR-712** Large extension speaker.....£14.95



Single Band Mobile Antennas

- MR214** 2 metre straight stainless 1/4 wave 3/8 fitting.....£4.95
- PL259** type.....£5.95
- MR214S-2** 2 Metre stainless steel 1/4 wave with built in spring PL259 fitting.....£12.95
- MR258** 2 Metre 5/8 wave 3.2 dBd Gain (3/8 fitting) (Length 58").....£12.95
- MR268S** 2 Metre 5/8 wave 3.5dBd gain Length 51" S0239 fitting.....£19.95
- MR290** 2 Metre (2 x 5/8 Gain: 7.0dBd) (Length: 100"). PL259 fitting, "the best it gets".....£39.95
- MR444S-2** 4 Metre straight stainless 1/4 wave with spring and PL259 fitting.....£14.95
- MR625** 6 Metre base loaded (1/4 wave) (Length: 50") commercial quality.....£19.95
- MR614** 6 Metre loaded 1/4 wave (Length 56") (3/8 fitting).....£14.95



Single Band End Fed Base Antennas

- 70 cm** 1/2 wave (Length 26") (Gain: 2.5dB) (Radial free).....£24.95
- 2 metre** 1/2 wave (Length 52") (Gain 2.5dB) (Radial free).....£24.95
- 4 metre** 1/2 wave (Length 80") (Gain 2.5dB) (Radial free).....£39.95
- 6 metre** 1/2 wave (Length 120") (Gain 2.5dB) (Radial free).....£44.95
- 6 metre** 1/8 wave (Length 150") (Gain 4.5dB) (3 x 28" radials).....£49.95

Vertical Fibreglass Co-Linear Antennas

New co-linear antennas with specially designed tubular vertical coils that now include wide band receive! Remember, all our co-linears come with high quality N-type connections.

- SQBM105 Mk.2** Dual Bander Radial FREE!.....£29.95
 (2m 2.0dBd) (70cm 4.5dBd) (RX:25-2000 MHz) (Length 28")
- SQBM100 Mk.2** Dual Bander.....£39.95
 (2m 3dBd) (70cm 6dBd) (RX:25-2000 MHz) (Length 39")
- SQBM110 Mk.2** Dual Bander (Radial FREE!).....£49.95
 (2m 3dBd) (70cm 6dBd) (RX:25-2000 MHz) (Length 39")
- SQBM200 Mk.2** Dual Bander.....£49.95
 (2m 4.5dBd) (70cm 7.5dBd) (RX:25-2000 MHz) (Length 62")
- SQBM223Mk.2** Tri Bander.....£59.95
 (2m 4.5dBd) (70cm 7.5dBd) (23cm 12.5dBd) (RX 25-2000MHz) Length: 62"
- SQBM500 Mk.2** Dual Bander Super Gainer.....£64.95
 (2m 6.8dBd) (70cm 9.2dBd) (RX:25-2000 MHz) (Length 100")
- SQBM800 Mk.2** Dual Bander Ultimate Gainer.....£119.95
 (2m 8.5dBd) (70cm 12.5dBd) (RX:25-2000 MHz) (Length 5.2m)
- SQBM1000 Mk.2** Tri Bander.....£69.95
 (6m 3.0dBd) (2m 6.2dBd) (70cm 8.4dBd) (RX:25-2000 MHz) (Length 100")



Single Band Vertical Co-Linear Base Antenna

- BM33** 70 cm 2 X 5/8 wave Length 39" 7.0 dBd Gain.....£34.95
- BM45** 70cm 3 X 5/8 wave Length 62" 8.5 dBd Gain.....£49.95
- BM55** 70cm 4 X 5/8 wave Length 100" 10 dBd Gain.....£69.95
- BM60** 2mtr5/8 Wave, Length 62", 5.5dBd Gain.....£49.95
- BM65** 2mtr 2 X 5/8 Wave, Length 100", 8.0 dBd Gain.....£69.95

MFJ Products

See our website for full details.

- Automatic Tuners**
- MFJ-991** 1.8-30MHz 150W SSB/100W CW ATU.....£199.95
- MFJ-993** 1.8-30MHz 300W SSB/150W CW ATU.....£189.95
- MFJ-994** 1.8-30MHz 600W SSB/300W CW ATU.....£319.95
- Manual Tuners**
- MFJ-16010** 1.8-30MHz 20W random wire tuner.....£49.95
- MFJ-902** 3.5-30MHz 150W mini travel tuner.....£65.95
- MFJ-902H** 3.5-30MHz 150W mini travel tuner with 4:1 balun.....£109.95
- MFJ-904** 3.5-30MHz 150W mini travel tuner with SWR/PWR.....£109.95
- MFJ-904H** 3.5-30MHz 150W mini travel tuner with SWR/PWR 4:1 balun.....£129.95
- MFJ-901B** 1.8-30MHz 200W Versa tuner.....£74.95
- MFJ-971** 1.8-30MHz 300W portable tuner.....£79.95
- MFJ-945E** 1.8-54MHz 300W tuner with meter.....£89.95
- MFJ-941E** 1.8-30MHz 300W Versa tuner 2.....£99.95
- MFJ-948** 1.8-30MHz 300W deluxe Versa tuner.....£129.95
- MFJ-949E** 1.8-30MHz 300W deluxe Versa tuner with DL.....£124.95
- MFJ-934** 1.8-30MHz 300W tuner complete with artificial GND.....£179.95
- MFJ-974B** 3.6-54MHz 300W tuner with X-needle SWR/WATT.....£169.95
- MFJ-969** 1.8-54MHz 300W all band tuner.....£149.95
- MFJ-962D** 1.8-30MHz 1500W high power tuner.....£249.95
- MFJ-986** 1.8-30MHz 300W high power differential tuner.....£299.95
- MFJ-989D** 1.8-30MHz 1500W high power roller tuner.....£329.95
- MFJ-976** 1.8-30MHz 1500W balanced line tuner with X-needle SWR/WATT meter.....£429.95



HB9CV 2 Element Beam 3.5dBd

- HB9-70** 70cm (Boom 12").....£19.95
- HB-2** 2 metre (Boom 20").....£24.95
- HB9-4** 4 metre (Boom 23").....£34.95
- HB9-6** 6 metre (Boom 33").....£44.95
- HB9-10** 10 metre (Boom 52").....£69.95
- HB9-627** 6/270 Triband.....£64.95



Halo Loops

- HLP-2** 2 metre (size approx 300mm square).....£14.95
- HLP-4** 4 metre (size approx 600mm square).....£24.95
- HLP-6** 6 metre (size approx 800mm square).....£29.95

These very popular antennas square folded di-pole type antennas

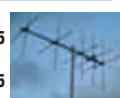
G5RV Inductors

- Convert your half size G5RV into a full size with just 8ft either side. Ideal for the small garden
- G5RV-IND**.....£19.95



Crossed Yagi Beams (fittings stainless steel)

- XYG5-2** 2 metre 5 Element (Boom 64") (Gain 7.5dBd).....£89.95
- XYG8-2** 2 metre 8 Element (Boom 126") (Gain 11.5dBd).....£109.95
- XYG13-70** 70 cm 13 Element (Boom 83") (Gain 12.5dBd).....£79.95



Yagi Beams (fittings stainless steel)

- YG4-2C** 2 metre 4 Element (Boom 48") (Gain 7dBd).....£29.95
- YG5-2** 2 metre 5 Element (Boom 63") (Gain 10dBd).....£49.95
- YG8-2** 2 metre 8 Element (Boom 125") (Gain 12dBd).....£69.95
- YG11-2** 2 metre 11 Element (Boom 185") (Gain 13dBd).....£99.95
- YG3-4** 4 metre 3 Element (Boom 45") (Gain 8dBd).....£59.95
- YG5-4** 4 metre 5 Element (Boom 128") (Gain 10dBd).....£69.95
- YG3-6** 6 metre 3 Element (Boom 72") (Gain 7.5dBd).....£64.95
- YG5-6** 6 metre 5 Element (Boom 142") (Gain 9.5dBd).....£84.95
- YG13-70** 70 cm 13 Element (Boom 76") (Gain 12.5dBd).....£49.95



ZL Special Yagi Beams (Fittings stainless steel)

- 2 metre 5 Element** (Boom 38") (Gain 9.5dBd).....£39.95
- 2 metre 7 Element** (Boom 60") (Gain 12dBd).....£49.95
- 2 metre 12 Element** (Boom 126") (Gain 14dBd).....£84.95
- 70 cm 7 Element** (Boom 28") (Gain 11.5dBd).....£34.95
- 70 cm 12 Element** (Boom 48") (Gain 14dBd).....£49.95
- The biggest advantage with a ZL-special is that you get massive gain for such a small boom length, making it our most popular beam antenna



G5RV Wire Antenna (10-40/80m) (Fittings stainless steel)

- | | HALF | FULL |
|---|--------|--------|
| Standard (enamelled) | £19.95 | £22.95 |
| Hard Drawn (pre-stretched) | £24.95 | £27.95 |
| Flex Weave (original high quality) | £29.95 | £34.95 |
| Flexweave PVC (clear coated PVC) | £34.95 | £39.95 |
| Deluxe 450 ohm PVC | £44.95 | £49.95 |
| Double size standard (204ft) | £39.95 | |
| TS1 Stainless Steel Tension Springs (pair) for G5RV..... | £19.95 | |



Reinforced Hardened Fibreglass Masts (GRP)

- GRP-125** ★ Length: 2m ★ Size: 30mm OD Grade: 2mm.....£14.95
- GRP-150** ★ Length: 2m ★ Size: 37mm OD Grade: 2mm.....£19.95
- GRP-175** ★ Length: 2m ★ Size: 44mm OD Grade: 2mm.....£24.95
- GRP-200** ★ Length: 2m ★ Size: 51mm OD Grade: 2mm.....£29.95

Portable Telescopic Masts

- LMA-S** Length 17.6ft open 4ft closed 2-1" diameter.....£79.95
- LMA-M** Length 26ft open 5.5ft closed 2-1" diameter.....£89.95
- LMA-L** Length 33ft open 7.2ft closed 2-1" diameter.....£99.95
- TRIPOD-P** Lightweight aluminium tripod for all above.....£39.95

Rotative HF Dipoles

- RDP-3B** 10/15/20mtrs length 7.40m.....£119.95
- RDP-4** 12/17/30mtrs length 10.50m.....£119.95
- RDP-40M** 40mtrs length 11.20m.....£169.95
- RDP-6B** 10/12/15/17/20/30mtrs boom length 1.00m.....£239.95

5ft Poles Heavy Duty (Swaged)

- 20ft Heavy Duty Swaged Pole Set**
 These heavy duty aluminium (1.8mm wall) have a lovely push fit finish to give a very strong mast set
- 1.25"** set of four 5ft sections.....£29.95
- 1.50"** set of four 5ft sections.....£39.95
- 1.75"** set of four 5ft sections.....£49.95
- 2.00"** set of four 5ft sections.....£59.95



CHECK ON-LINE FOR ALL UPDATES, NEW PRODUCTS & SPECIAL OFFERS

www.moonrakerukltd.com

★ Postage is a maximum of £7.00 on all orders ★
 (UK mainland only)

Connectors & Adapters

PL259/9 plug (Large entry).....	£0.75
PL259/9C (Large entry) compression type fit.....	£1.95
PL259 Reducer (For PL259/9 to conv to PL259/6).....	£0.25
PL259/6 plug (Small entry).....	£0.75
PL259/6C (Small entry) compression type fit.....	£1.95
PL259/7 plug (For mini 8 cable).....	£1.00
BNC Screw type plug (Small entry).....	£1.25
BNC Solder type plug (Small entry).....	£1.25
BNC Solder type plug (Large entry).....	£3.00
N-Type plug (Small entry).....	£3.00
N-Type plug (Large entry).....	£3.00
PL259 Chassis socket (Round).....	£1.00
PL259 Chassis socket (Square).....	£1.00
N-Type Chassis socket (Round).....	£3.00
N-Type Chassis socket (Square).....	£3.00
PL259 Double female adapter.....	£1.00
PL259 Double male adapter.....	£1.00
N-Type Double female.....	£2.50
PL259 to BNC adapter.....	£2.00
PL259 to N-Type adapter.....	£3.00
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SMA to BNC adapter (Male to female).....	£3.95
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3/8 Whip stud (For 2.5mm whips).....	£2.95

Please add just £2.00 P&P for connector only orders

PLEASE PHONE FOR LARGE CONNECTOR ORDER DISCOUNTS

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Tripod-2 (free standing with 2-OD for use with 2" joiner or 1.5" pole inside).....	£69.95
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6" Stand Off Bracket (complete with U Bolts).....	£6.00
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Single chimney lashing kit (suitable up to 2 mast).....	£14.95
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3-Way Pole Spider for Guy Rope/wire.....	£3.95
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Dog bone insulator.....	£1.00
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EGG-S (small porcelain egg insulator).....	£1.95
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CAR PLATE (drive on plate to suit 1.5 to 2" mast/pole).....	£19.95
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RG58 best quality standard per mt.....	35p
RG58 best quality military spec per mt.....	60p
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RG213 best quality military spec per mt.....	£1.00
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7-core rotator cable per mt.....	£1.00
10 amp red/black cable 10 amp per mt.....	40p
20 amp red/black cable 20 amp per mt.....	75p
30 amp red/black cable 30 amp per mt.....	£1.25

Please phone for special 100 metre discounted price

Baluns

MB-1 1:1 Balun 400 watts power.....	£24.95
MB-4 4:1 Balun 400 watts power.....	£24.95
MB-6 6:1 Balun 400 watts power.....	£24.95
MB-1X 1:1 Balun 1000 watts power.....	£29.95
MB-4X 4:1 Balun 1000 watts power.....	£29.95
MB-6X 6:1 Balun 1000 watts power.....	£29.95
MB-Y2 Yagi Balun 1.5 to 50MHz 1kW.....	£24.95

Duplexers & Antenna Switches

DX-720D Duplexer *Port 1: HF + 6 + 2m (1.6-150MHz). *Port 2: 70cm (400-460MHz). *Connection: Fixed 2 x PL259 & 1 x PL259.....	£19.95
MX-72 Duplexer *Same spec as DX-720D but with PL259 fly leads.....	£29.95
MX-627 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz).....	£39.95
CS201 Two-way di-cast antenna switch. Freq: 0-1000MHz max 2,500 watts PL259 fittings.....	£14.95
CS201-N Same spec as CS201 but with N-type fittings.....	£19.95
CS401 Same spec as CS201 but 4-way.....	£39.95
CS401N Same spec as CS401 but with N-type fittings.....	£49.95

Antennas Rotators

AR-300XL Light duty UHFVHF.....	£49.95
RC5-1 Heavy duty HF.....	£339.95
RC5-3 Heavy Duty HF inc pre set control box.....	£419.95
AR26 Alignment Bearing for the AR300XL.....	£18.95
RC26 Alignment Bearing for RC5-1/3.....	£49.95
RC5A-3 Serious heavy duty HF.....	£579.95

Complete Mobile Mounts

All mounts come complete with 4m RG58 coax terminated in PL259 (different fittings available on request).

3.5" Pigmy magnetic 3/8 fitting.....	£7.95
3.5" Pigmy magnetic PL259 fitting.....	£9.95
5" Limpet magnetic 3/8 fitting.....	£9.95
5" Limpet magnetic PL259 fitting.....	£12.95
7" Turbo magnetic 3/8 fitting.....	£12.95
7" Turbo magnetic PL259 fitting.....	£14.95
Tri-Mag magnetic 3 x 5" 3/8 fitting.....	£29.95
Tri-Mag magnetic 3 x 5" PL259 fitting.....	£29.95
HKITHD-38 Heavy duty adjustable 3/8 hatch back mount.....	£29.95
HKITHD-SO Heavy duty adjustable SO hatch back mount.....	£29.95
RKIT-38 Aluminium 3/8 rail mount to suit 1" roof bar or pole.....	£12.95
RKIT-SO Aluminium SO rail mount to suit 1" roof bar or pole.....	£14.95
RKIT-PR Stainless PL259 rail kit to suit 1" roof bar or pole.....	£24.95
PBKIT-SO Right angle PL259 pole kit with 10m cable/PL259 (ideal for mounting mobile antennas to a 1.25" pole).....	£19.95

Antenna Wire & Ribbon

Enamelled copper wire 16 gauge (50mtrs) ...	£16.95
Hard Drawn copper wire 16 gauge (50mtrs).....	£19.95
Equipment wire Multi Stranded (50mtrs).....	£14.95
Flexweave high quality (50mtrs).....	£27.95
PVC Coated Flexweave high quality (50mtrs).....	£37.95
300Ω Ladder Ribbon heavy duty USA imported (20mtrs).....	£14.95
450Ω Ladder Ribbon heavy duty USA imported (20mtrs).....	£17.95

(Other lengths available, please phone for details)

Miscellaneous Items

CDX Lightning arrester 500 watts.....	£19.95
MDX Lightning arrester 1000 watts.....	£24.95
AKD TV1 filter.....	£9.95
Amalgamating tape (10mtrs).....	£7.50
Desoldering pump.....	£2.99
Alignment 5pc kit.....	£1.99

Telescopic Masts (aluminium/fibreglass opt)

TMA-1 Aluminium mast ★ 4 sections 170cm each ★ 45mm to 30mm ★ Approx 20ft erect 6ft collapsed.....	£99.95
TMA-2 Aluminium mast ★ 8 sections 170cm each ★ 65mm to 30mm ★ Approx 40ft erect 6ft collapsed.....	£189.95
TMF-1 Fibreglass mast ★ 4 sections 160cm each ★ 50mm to 30mm ★ Approx 20ft erect 6ft collapsed.....	£99.95
TMF-1.5 Fibreglass mast ★ 5 sections 200cm each ★ 60mm to 30mm ★ Approx 30ft erect 8ft collapsed.....	£179.95
TMF-2 Fibreglass mast ★ 5 sections 240cm each ★ 60mm to 30mm ★ Approx 40ft erect 9ft collapsed.....	£189.95

HF Yagi

HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts.....	£399.95
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ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM FREQ:10-15-20 Mtrs GAIN:8 dBd BOOM:4.42m LONGEST ELE:8.46m POWER:2000 Watts.....	£329.95
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ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m POWER:2000 Watts.....	£599.95
40 Mtr RADIAL KIT FOR ABOVE.....	£99.00

Mini HF Dipoles (Length 11' approx)

MD020 20mt version approx only 11ft.....	£39.95
MD040 40mt version approx only 11ft.....	£44.95
MD080 80mt version approx only 11ft..... (slimline lightweight aluminium construction)	£49.95

HF Verticals

VR3000 3 BAND VERTICAL FREQ: 10-15-20 Mtrs GAIN: 3.5dB HEIGHT: 3.80m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials).....	£99.95
OPTIONAL 10-15-20mtr radial kit.....	£39.95

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN: 3.5dB HEIGHT: 6.50m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials).....	£119.95
OPTIONAL 10-15-20mtr radial kit.....	£39.95
OPTIONAL 40mtr radial kit.....	£14.95

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dB HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials).....	£169.95
OPTIONAL 10-15-20mtr radial kit.....	£39.95
OPTIONAL 40mtr radial kit.....	£14.95
OPTIONAL 80mtr radial kit.....	£16.95

EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-80 Mtrs GAIN: 3.5dB HEIGHT: 5.00m RADIAL LENGTH: 1.70m(included) POWER: 800 Watts.....	£299.95
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EVX8000 8 BAND VERTICAL FREQ:10-12-15-17-20-30-40 Mtrs (80m optional) GAIN: 3.5dB HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included) POWER: 2000 Watts.....	£319.95
80 MTR RADIAL KIT FOR ABOVE.....	£89.00

(All verticals require grounding if optional radials are not purchased to obtain a good VSWR)

Trapped Wire Di-Pole Antennas (Hi grade heavy duty Commercial Antennas)

MDT-6 FREQ:40 & 160m LENGTH: 28m POWER:1000 Watts.....	£59.95
MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts.....	£49.95
MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20mtrs POWER:1000 Watts.....	£59.95
MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts.....	£99.95
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts.....	£49.95
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts.....	£89.95

(MTD-5 is a crossed di-pole with 4 legs)



Callers welcome. Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com
CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR

Scanner Fibreglass Vertical Antennas

SSS-MK1 Freq: 0-2000Mhz RX ★ Length: 100cm ★ Socket: PL259**£29.95**
SSS-MK2 Freq: 0-2000Mhz RX ★ Length: 150cm ★ Socket: PL259
 ★ Gain: 3dB over SSS-1.....**£39.95**

Scanner Discone Antennas

DISCONE ★ Type: Ali ★ Freq: 25-1300Mhz
 ★ Length: 100cm ★ Socket: PL259.....**£29.95**
SUPER DISCONE ★ Type: Ali ★ Freq: 25-2000Mhz ★ Length: 140cm ★ Socket: PL259
 ★ Gain: 3dB.....**£39.95**
HF DISCONE ★ Type: Ali ★ Freq: 0.5-2000Mhz
 ★ Length: 185cm ★ Socket: PL259
 ★ Gain: 1.5dB.....**£49.95**
ROYAL DISCONE 2000 ★ Type: Stainless
 ★ Freq: RX: 25-2000Mhz Freq: TX 6/2&70cm+ ★ Length: 155cm
 ★ Socket: N-Type ★ Gain: 4.5dB**£49.95**
ROYAL DOUBLE DISCONE 2000 ★ Type: Stainless ★ Freq RX:
 25-2000Mhz Freq: TX 2&70cm ★ Length: 150cm ★ Socket: N-Type
 ★ Gain: 5.5dB.....**£59.95**

Scanner Mobile Antennas

G-SCAN II ★ Type: Twin coil ★ Freq: 25-2000Mhz
 ★ Length: 65cm ★ Base: Magnetic/Cable/BNC
**£24.95**
SKYSCAN MOBILE ★ Type: Multi whip
 ★ Freq: 25-2000Mhz ★ Length: 65cm
 ★ Base: Magnetic/Cable/BNC
**£19.95**

Scanner Portable/Indoor Antennas

SKYSCAN DESKTOP ★ Type: Discone style
 ★ Freq: 25-2000Mhz ★ Length: 90cm
 ★ Cable: 4m with BNC.....**£49.95**
Tri-SCAN 3 ★ Type: Triple Coil ★ Freq: 25-2000Mhz
 ★ Length: 90cm ★ Cable: 4m with BNC.....**£39.95**

Scanner Hand-held Antennas

*Going out? Don't miss out! Get a super Gainer!
 p+p just £2.00*
MRW-100 SUPER GAINER ★ Freq: 25-1800Mhz ★ Length:
 40cm ★ Fitting: BNC**£19.95**
MRW-210 SUPER GAINER ★ Freq: 25-1800Mhz ★ Length:
 40cm ★ Fitting: SMA**£19.95**

Scanner Preamplifier

*A great pre-amp at an incredible new
 low low price!*
MRP-2000 Mk2 ★ Active wideband pre-amp
 ★ Freq: 25-2000Mhz
 ★ Gain: 6-20dB ★ Power: 9-15v (battery not included)
 ★ Lead: 1m with BNC.....**£29.95**

Guy Rope 30 metres

MGR-3 3mm (maximum load 250 kgs).....**£6.95**
MGR-4 4mm (maximum load 380 kgs).....**£14.95**
MGR-6 6mm (maximum load 620 kgs).....**£29.95**

CB Radio

MOONRAKER MINOR ★ 40 UK Channels
 ★ Small compact design ★ Robust lightweight
 microphone ★ Full 4 watts output ★ A great
 radio at a great price.....**£49.95**

MOONRAKER FA5000 PROFESSIONAL
 ★ 80 Channels (UK40 & CEPT40) ★ Full 4 watts
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 our alternate back light ★ A beautiful top end radio with a whole
 host of features for just.....**£89.95**

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Postage on all handies just £2.00
MRW-300 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX:
 25-1800Mhz ★ Power: 10w ★ Length: 21cm
 ★ Connection: SMA**£12.95**
MRW-310 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX:
 25-1800Mhz ★ Power: 10w ★ Length: 40cm ★ Connection:
 BNC Gain: 2.15dB.....**£14.95**
MRW-200 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX:
 25-1800Mhz ★ Power: 10w ★ Length: 21cm ★ Connection:
 SMA**£16.95**
MRW-205 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX:
 25-1800Mhz ★ Power: 10w ★ Length: 40cm ★ Connection:
 BNC Gain: 2.15dB.....**£19.95**
MRW-222 SUPER ROD ★ Type: Telescopic whip ★ Freq
 TX: 2&70 RX: 25-1800Mhz ★ Power: 20w ★ Length: 23-91cm
 ★ Connection: BNC ★ Gain: 2m 3.0dB 70cm 5.5dB
 ★ DX Performance**£24.95**

Hand-held HF Antennas

Postage on all handies just £2.00
MRW-HF6 ★ Type: Telescopic Whip ★ Freq: TX: 6m RX: 6-
 70cm ★ Power: 50 Watts ★ Length: 135cm
 ★ Connection: BNC**£19.95**
MRW-HF10 ★ Type: Telescopic Whip ★ Freq: TX: 10m RX: 10-
 4m ★ Power: 50 Watts ★ Length: 135cm
 ★ Connection: BNC**£19.95**
MRW-HF15 ★ Type: Telescopic Whip ★ Freq: TX: 15m RX: 15-
 6m ★ Power: 50 Watts ★ Length: 135cm
 ★ Connection: BNC**£19.95**
MRW-HF20 ★ Type: Telescopic Whip ★ Freq TX: 20m RX: 20-6m
 ★ Power: 50w ★ Length: 135cm ★ Connection: BNC.....**£22.95**
MRW-HF40 ★ Type: Telescopic Whip ★ Freq TX: 40m RX: 40-10m
 ★ Power: 50w ★ Length: 140cm ★ Connection: BNC.....**£22.95**
MRW-HF80 ★ Type: Telescopic Whip ★ Freq TX: 20m RX: 80-10m
 ★ Power: 50w ★ Length: 145cm ★ Connection: BNC.....**£24.95**

100m Cable Bargains

RG58 Standard 6mm coax cable**£24.95**
RG58M Military spec 6mm coax cable.....**£39.95**
RGMINI8 Military spec 7mm coax cable.....**£54.95**
RG213 Military spec 9mm coax cable.....**£84.95**
RH100 Military spec 9mm coax cable.....**£99.95**
FLEXWEAVE Original antenna wire.....**£49.95**
PVC FLEXWEAVE Original pvc coated antenna wire.....**£69.95**
300 Ribbon cable USA imported.....**£59.95**
450Ω Ribbon cable USA imported.....**£69.95**

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UKSCAN-B The 9th Edition UK Scanning Directory A
 must have publication!
**£19.50**

LOGBB-B Base log book for licensed amateurs
**£4.95**
LOGBM-B Mobile/Portable log book for licensed
 amateurs.....**£4.95**

High Gain Digital TV Antennas

DIGI-52 Wideband all groups ★ Element: 52
 ★ Gain: 14-15dB**£49.95**
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Doing it by Design

This month, Tony Nailer G4CFY describes the second part of his design of a Top Band amplitude modulated transmitter-receiver

The ambitious 1.8MHz transmitter-receiver project, which I started in Doing it By Design (DiBD) in the September *PW*, offers progress on four fronts. This time, I'm describing the receiver printed circuit board (p.c.b.), development of the variable frequency oscillator (v.f.o.), pre-selector board and a decision involving the use in the transmitter of high or low level modulation and how to achieve it.

Clearly it's incumbent upon me to move the project forward, so that something useful results from this month's article and this means developing the v.f.o. to a point that it can be reproduced by some of the readers. By laying out the receiver and pre-selector boards, the complete 1.8MHz

receive side is finished by the end of this article.

The VFO Development

In the previous DiBD, I modified the v.f.o. design of the Portland VFO article published in *PW* of March 2006. This required changing from varicap tuning to conventional variable capacitor, recalculating the values of inductor and capacitors.

The resistors stayed the same, with 100kΩ gate-to-ground and 2.2kΩ source-to-ground. The inductance was made up from two TOKO 10K type 4087 inductors in series and the v.f.o. circuit is shown in Fig. 1.

A stabilised supply for the v.f.o. could be

made using a 6.2V zener diode. If the f.e.t. uses 1mA, and 5mA is allowed to flow in the zener, the series resistor will be;

$$R = (13.5 - 6.2)/6\text{mA}. R = 1216\Omega. \text{ Let } R = 1200, \text{ then } I = 7.3/1200 = 6.08\text{mA}.$$

Breadboard Tests On VFO

Please note, that the coils have a tap but no secondary winding! I hadn't realised this and tried using the secondary terminals of coil, on pins 4 and 6 and (of course!) I achieved no output. Then I coupled a 56pF capacitor to the source of the oscillator and undertook some measurements from this point.

I found it easy to achieve the desired tuning range by interactive adjustment of the core of one coil and by adjusting the tetfer trimcap. The output level from this point observed on my oscilloscope was 200mV peak-to-peak (p-p). I decided that a buffer stage would be required to prevent pulling of the oscillator by receive and transmit mixer loading.

Buffer amplifier

A suitable buffer/amplifier circuit (similar to that in the original Portland VFO) was again chosen, see Fig. 2. This circuit uses both alternating current (a.c.) and direct current (d.c.) feedback to maintain gain and stability.

When calculating the component values, (if we) let the base/emitter voltage drop be 0.7V we'll assume the collector current I_c equals the emitter current I_e . Base voltage is designated V_b , collector voltage V_c , and emitter voltage V_e . These symbols will have added suffixes 1 and 2, for Tr1 and Tr2 respectively.

I chose the Tr2 stage to have a gain of four or five, with R_6 as 1kΩ, and R_7 as 220Ω. The feedback factor I chose as 4:1 with R_8 as 10kΩ and R_5 as 3.3kΩ.

Buffer calculations

The base voltage V_{b2} will be $0.7V + V_{e2}$. $V_{e2} = I_{c2} * 220R$. So $V_{b2} = 0.7 + I_{c2} * 220$. As R_8 is 3 times R_5 , then $V_{e3} = 4 * V_{b2}$, and $V_{c2} = 4 * V_{b2} + 0.7$. Putting this together gives $V_{c2} = 4 * (0.7 + I_{c2} * 220) + 0.7$.

But $V_{c2} = 13.5V - I_{c2} * R_6$. We now have simultaneous equations. Putting them together gives $4 * (0.7 + I_{c2} * 220) + 0.7 = 13.5 - 1000 * I_{c2}$,

then $2.8 + 880 * I_{c2} + 0.7 = 13.5 - 1000 * I_{c2}$.

Changing sides and changing signs gives,

$$1000 * I_{c2} + 880 * I_{c2} = 13.5 - 2.8 - 0.7, \\ 1880 * I_{c2} = 10. \text{ So } I_{c2} = 10 / 1880 = 5.32\text{mA}.$$

This means that, $V_{e2} = 5.32\text{mA} * 220R = 1.17V$. $V_{b2} = 1.17 + 0.7 = 1.87V$. $V_{e3} = 4 * V_{b2} = 4 * 1.87 = 7.48V$. Also $V_{c2} = 13.5 - 1000 * 5.32\text{mA} = 8.18V$.

With 5.32mA flowing in Tr2, let the current

Fig. 1: The circuit of the oscillator, unusually has two inductors to double the inductance of the individual coils.

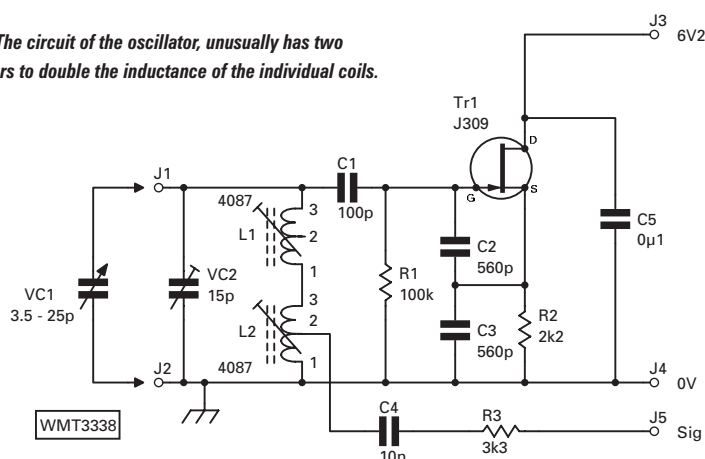
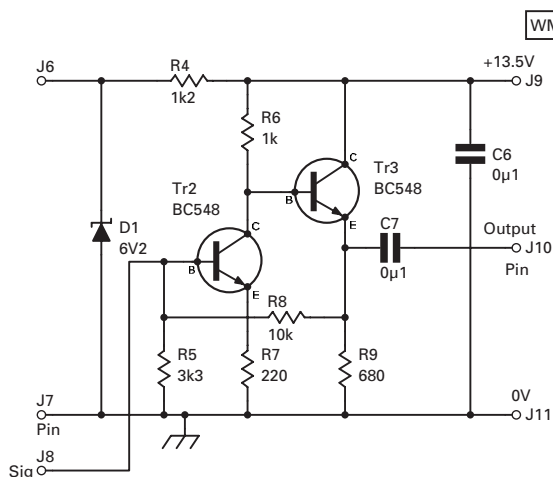


Fig. 2: A simple two transistor buffer stage, gives well-defined voltage gain.



in Tr3 about double that. $R_9 = V_e / I_{c3} = 7.48 / 10.6\text{mA} = 705\Omega$. (I chose 680Ω) ohms. This gives $I_{c3} = 7.48 / 680 = 11\text{mA}$. The input resistor is used to further increase the input impedance of the buffer. To start with I used $3.3\text{k}\Omega$.

Buffer Breadboarded

The circuit was then added to the v.f.o. prototype board and d.c. tested using a very high impedance multimeter. The emitter, base and collector voltages were very close to those calculated.

The a.c. output (unloaded) measured on the scope was 2V p-p . The output impedance was found by putting a $1\text{k}\Omega$ trim pot from output to ground, then reducing its value until the envelope reduced in amplitude to 1V p-p . This occurred at 37Ω with the waveform heavily distorted.

When I measured into the 50Ω input of the spectrum analyser, the second and subsequent harmonics reduced by a nominal 12dB each. When adding a 100Ω resistor at the buffer output to reduce

loading, the harmonics then reduced by a nominal 15dB each.

Low Pass Filter

A harmonic half-wave filter was designed to follow the buffer. The circuit is shown in Fig 3. For this type of circuit $L_1 = L_2 = 50\Omega$ reactance at the cut-off frequency. Then $L = XL / (2 * \pi * f)$. Likewise $C_1 = C_3 = 50\Omega$, and C_2 is 25Ω at the cut-off frequency. Then $C = 1 / (2 * \pi * f * X_c)$.

Several versions of the filter were undertaken until a suitable value of L and C were obtained. With a cut-off frequency of 1.55MHz and a load of 457.7Ω , $L = 457.7 / (2 * \pi * 1.55) \mu\text{H}$, $L = 47\mu\text{H}$. $C = 1 / (2 * \pi * f * 457.7) \text{fF}$. $C = 224\text{pF}$.

Let C_1 and C_3 be 220pF and C_2 be $2 \times 220\text{pF}$ in parallel.

The oscillator has an output impedance of 52Ω , so R_1 has to be 390Ω . Similarly, R_2 has to be 390Ω , and R_3 is 56Ω . Please note, that measurements can be taken with a high impedance oscilloscope probe across R_3 and when feeding a frequency counter

or the 50Ω input of a spectrum analyser, R_3 is omitted.

Oscilloscope measurements across R_3 gave 400mV p-p . Removing R_3 and viewing the output on a spectrum analyser showed the 2nd harmonic to be 30dB down and the 3rd harmonic 58dB down.

The VFO Tap output

I then connected the buffer input to the tap on L_2 of the v.f.o. and disconnected the low-pass filter. The output amplitude was then 1.5V p-p on the scope. Using 100Ω at the buffer output to feed the spectrum analyser I could see it showed the 2nd harmonic as being 44dB down and the 3rd harmonic 52dB down.

Clearly the result I've just stated is a much better solution than using the source output to the buffer plus a low-pass filter. So, the low-pass filter is now redundant.

Heat Dissipation

The oscillator f.e.t. Tr1 is running only $800\mu\text{A}$ drain current. This gives 1.4mW dissipated by the source resistor and 3.56mW dissipated by the f.e.t. This is the 'secret' of the stability of this design, keeping the heat generating components away from the reactive components in the v.f.o.

Buffer Dissipation

The supply resistor, R_4 , (to the zener diode) has 7.3V across it and 6.08mA flowing in it, a dissipation of $7.3 * 6.08\text{mA} = 44.4\text{mW}$. The zener has 6.2V across it and 5.2mA through it, a dissipation of 32mW .

The transistor, Tr2, has a collector voltage of 8.18V and emitter voltage of 1.17V and a collector current of 5.32mA . The dissipation in it is $(8.18 - 1.17) * 5.32\text{mA} = 37.3\text{mW}$.

The transistor, Tr3, has a collector voltage of 13.5V and emitter voltage of 7.48V and a collector current of 11mA . Dissipation is $(13.5 - 7.48) * 11\text{mA} = 66.2\text{mW}$.

Similar calculations have been done for the resistors and together they dissipate 121.5mW . Total heat dissipation of the buffer board is 300mW .

VFO & Buffer Construction

The tuning device of the v.f.o. is part of the oscillatory circuit and has to be in rigid mechanical contact with it. I found a similar box to that used in the Portland VFO but slightly larger. This would allow the variable capacitor to be positioned to one side of the box with the v.f.o. circuitry on a p.c.b. alongside it.

To keep the heat away from the v.f.o. components, the buffer board would be positioned on the outside of the lid of the box. This would require p.t.f.e. feed-through capacitors to be mounted on the side of the box. The connections to the buffer board

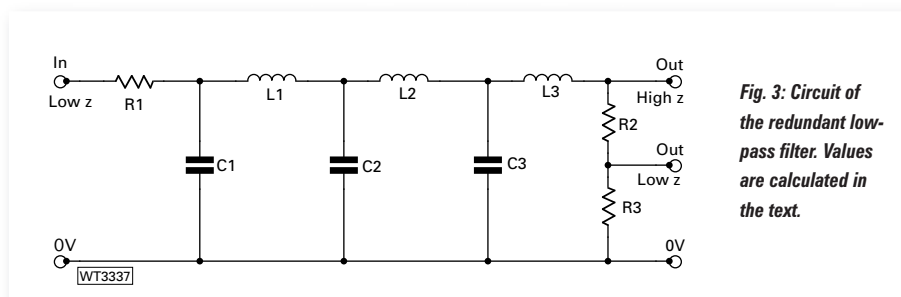


Fig. 3: Circuit of the redundant low-pass filter. Values are calculated in the text.

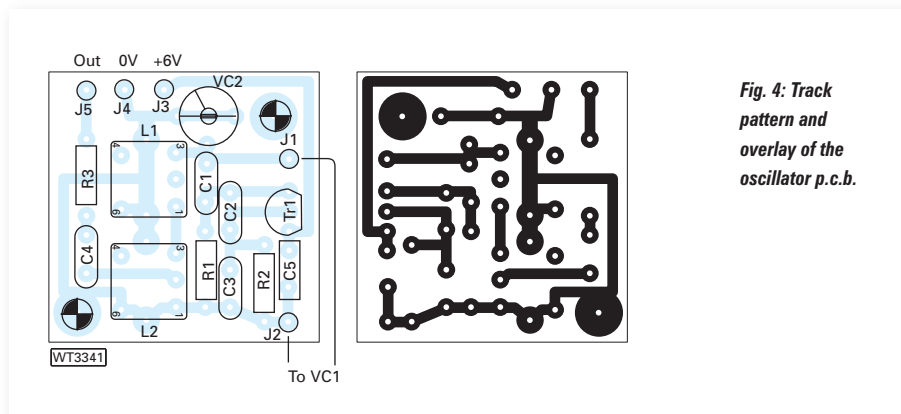


Fig. 4: Track pattern and overlay of the oscillator p.c.b.

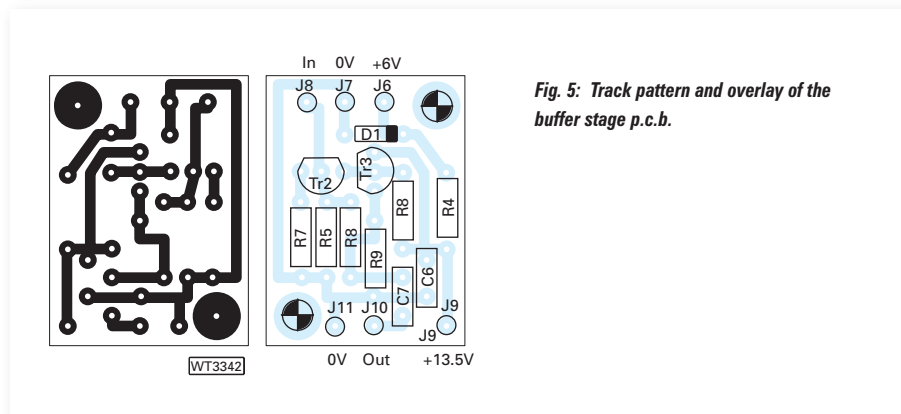
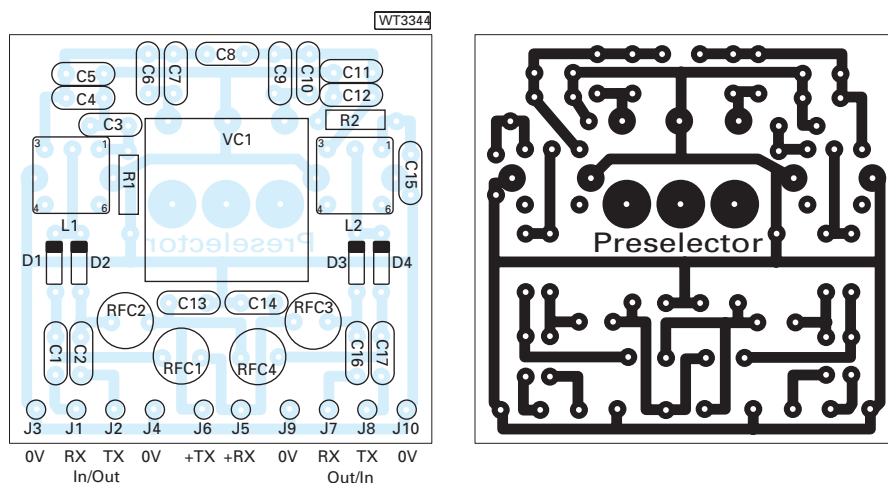
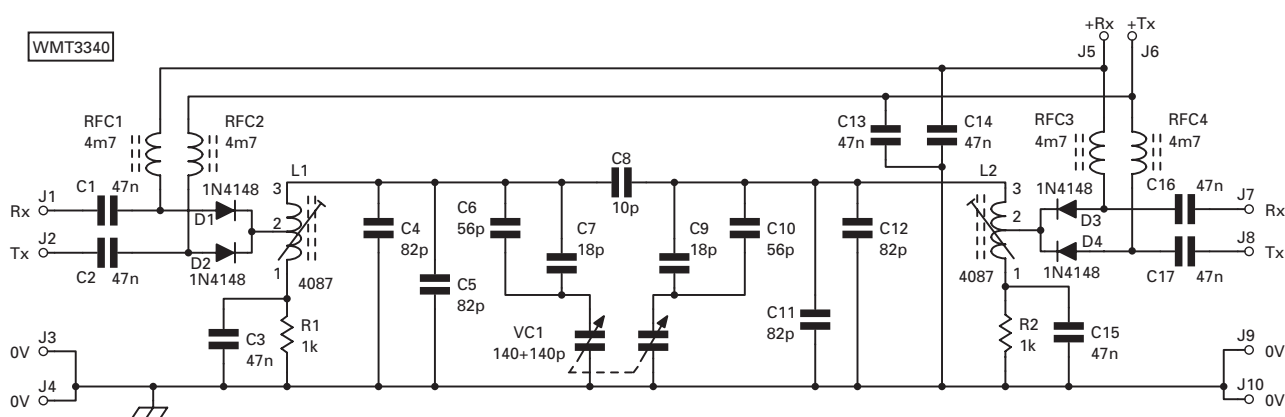
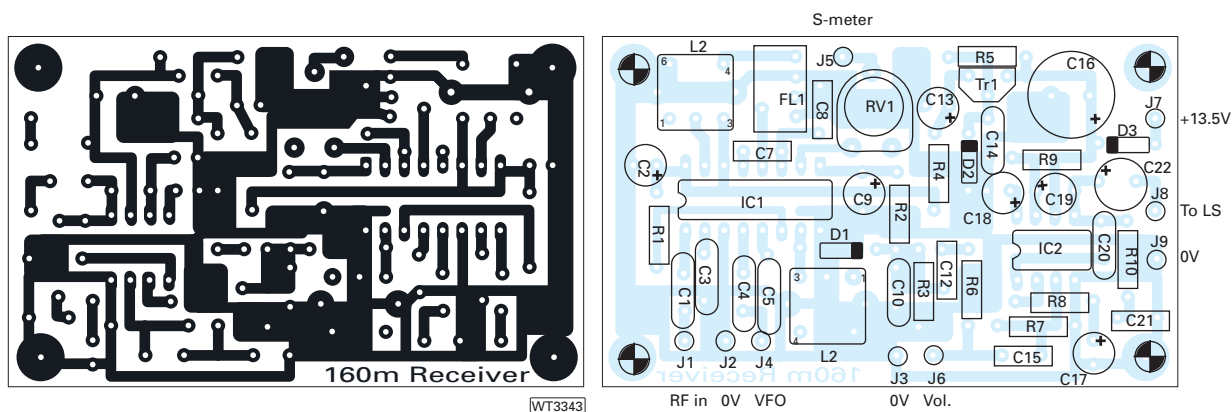


Fig. 5: Track pattern and overlay of the buffer stage p.c.b.



Kits & Bits

The v.f.o. and buffer p.c.b. boards, £3.25 the pair, P&P £1. Variable capacitor and other components £23.40, P&P £2. Drilled box and feed-through capacitors, £6.50, £2.50. Complete VFO/Buffer kit £33.15, P&P £3. Receiver p.c.b., £4.30, P&P £1. Components £12.80, P&P £1. Volume control, meter and loudspeaker, £13, P&P £3. Complete kit with external parts £30.10p, P&P £3. Pre-selector p.c.b., £3.50, P&P £1. Components including polyvaricon, £8.50, P&P £1.50. Complete kit, £12, P&P £2.

Receiver Board

The circuit of the receiver was given in the previous DiBD. No changes have been made since then. A printed circuit was laid out and the p.c.b. artwork and component lay out are shown in **Fig. 6**.

The Pre-selector

The complete circuit of the 1.8MHz pre-

would then go up and over the corner of the lid.

The available space for each board was then measured and the boards were laid out. I was able to position the f.e.t. used in v.f.o. and its source resistor well away from the other reactive components to minimise heating. Layouts and component identifications are shown in **Fig. 4** and **5**.

Further exploratory tests of the v.f.o. and breadboard revealed that putting my hand to the tuning capacitor caused detuning by over 1kHz. Due to this, the v.f.o. unit will need to be housed in a metal casing or a shielded plastic box. A suitable r.f.i. shielded ABS box was found in the Farnell catalogue, number 117-1593. The external dimensions 85x56x40mm.

selector together with receive and transmit switching is shown in **Fig. 7**. Since writing the previous DiBD, I have determined that my usual sources of polyvaricon type capacitors have dried up. However, I have an old Maplin catalogue that includes a.m./f.m. miniature tuning capacitors type AB11M and FT78K.

The AB11M has two 126pF sections and two 20pF sections. The FT78K has two 141pF sections and two 59pF pre-sets. If these are still available, the AB11M can be used with capacitors C6 & C10 being 68pF. The FT78K type can be used with C6 and C10 being 56pF. I then laid out a p.c.b. and the artwork and component identification are shown in **Fig. 8**.

Complete Receiver

Constructors who intend to build a complete transceiver will build the pre-selector with its diode switching. For those who only want a top band a.m. receiver, the switching components can be left off the board and the coil windings wired directly to pins J1 and J7 respectively.

When using the complete pre-selector but without the transmit section, it will be necessary to connect a 10kΩ resistor between J6 and J4 so the diodes D2 and D4 are reverse biased. The receive supply

to that board will allow the receive path to function normally.

The antenna (aerial) is connected to pin J1 of the pre-selector, and the output taken from pins J7 and J9, to pins J1 and J2 on the main receiver board. Outputs from pins J10 and J11 of the buffer board connect to pins J4 and J2 of the receiver board.

The wiper of a 10kΩ potentiometer is connected to pin J6 of the receiver board. The earthy side of the potentiometer is connected to pin J3. A 100μA signal meter is connected to pin J5 and 0V and the loudspeaker is connected to pins J8 and J9. The same supply (13.5V) is connected to the receiver, the buffer, and the pre-selector.

Aligning The VFO

To start the alignment tune the v.f.o. to its highest frequency and the polyvaricon fully clockwise. Increase the volume so the background noise is audible and then adjust L1 and 2 on the pre-selector for maximum noise.

Next, tune the v.f.o. to its lowest frequency and the polyvaricon fully anti-clockwise. Try adjusting the cores of L1 and 2 again to see if they are peaked. If not then try adjusting the trimmers on the back of the polyvaricon to obtain the peak.

Tony Nailer G4CFY

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Finally, return to the top end of the band and repeat the process. Alternating between top and bottom of the band and adjusting the coil cores and the trimmers, until you are satisfied.

With the receiver main board having a nominal sensitivity of 1μV for 6dB signal-to-noise ratio, the performance should be very good. A good long antenna will provide the best signal-to-noise ratio. Short antennas will produce much poorer results. If the background noise alone drives the S-meter well up, it would be advisable to insert a 'T' or 'Pi' attenuator at the pre-selector input.

Tony's Postscript

The output from the buffer of 1.5Vp-p unloaded proved to be too high for the integrated circuit mixers. My experiments showed that if R7 was changed to 1kΩ, the output dropped to 700mV p-p unloaded. The good harmonic performance continued virtually unchanged. ●

Book Review

F. J. Camm – *The Practical Man*. By Gordon Cullingham Re-published by the Radio Society of Great Britain

Rob Mannion G3XFD writes: When the late **Gordon Cullingham** first published *F J Camm – The Practical Man*, I discovered he wasn't aware that *Practical Wireless* (Fred Camm's favourite in the Practical series) was still being published. Once I got a copy of Gordon's book, I contacted the author and we remained good friends up until the time of his death. In fact, Gordon was delighted to hear *PW* was still going strong and over the following few years I (getting fed up with copies of the FJ book disappearing during club visits!) made sure that there were library style tickets in a wallet inside each book, with purchase information on them for intending buyers! However to be honest, very few of the temporarily 'borrowed' copies ended up as lost! They would often be posted back to the office a few weeks later with anonymous apologies!

The book – as can be intimated from the title – is not specifically about *PW* itself. Instead, it's a detailed look at a remarkable man, who along with his brother (who became **Sir Sidney Camm**, the well known aircraft designer responsible for the Hawker *Hurricane* and the *Kestrel* 'jump jet', which eventually became the Hawker *Harrier* vertical take off jet) were responsible for an enormous amount of technical innovation during their working careers.

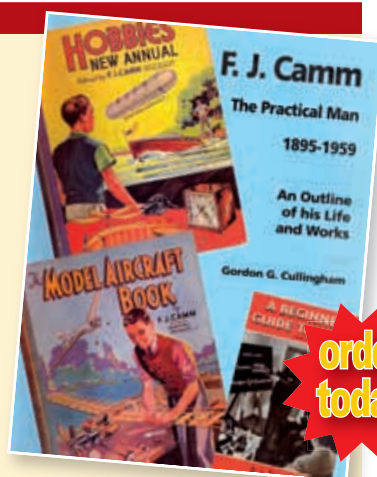
Until I obtained a copy of Gordon's booklet (originally privately produced, without the professional technical resources we now have in publishing), I knew very little about Fred Camm himself, other than what I had learned (mostly anecdotally) from the few living people who had worked or had contact with him. However, the well researched and information-packed slim booklet proved to be a mine of information. It turned out that the brothers Camm had started designing and selling their own model aircraft to the students at Eton College. Quite an achievement for working class boys who came from an otherwise very ordinary family,

living in a traditional, very simple, workman's (artisan's) house (the type where you step from the street straight into the 'front parlour') near Richmond on Thames, on the outskirts of London.

The simply-produced booklet will be an ideal reference source to anyone interested in Camm and his prolific output. It will also – perhaps – surprise readers to find out that Fred Camm also produced a design for a simple motor car that could be built over several weekends!

Once I had received my first copy and keen to know a little more of the personal life of Fred and his family, I was saddened to learn he had been widowed early in life and that his only son pre-deceased him by a number of years. These aspects of his life may explain why Fred Camm dedicated himself unsparingly to his work. Indeed, he could often be found working on Sunday mornings on *PW* and the many other 'practical' titles. His office was clouded with thick tobacco smoke as he made his way through his average 50 to 60 cigarettes a day (cartoons used produced 'in house' within George Newnes – the original publishers – invariably showed FJ with a cigarette stub hanging on his lower lip) and these probably led to his relatively early death in 1959 from bronchial pneumonia.

I have always recommended this booklet to any of our readers wishing to know more of the founding Editor of *PW* and I'm pleased it's available once again. **Highly recommended.**



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It's a Classic!

The Heathkit HW101



It's often said that to be a success, you have to be in the right place at the right time. This was certainly true of the Heathkit HW-101, which was undeniably Heath's most popular transceiver of all time.

The 'Hot Water 101', as it was affectionately known, was released just before Christmas 1970. It was a refinement of the HW-100, its immediate predecessor, which had gone on sale in 1968 as a low-cost alternative to the SB-101.

The HW-100 proved to be very popular, Heath proudly advertising it as 'the world's fastest selling transceiver'. But it did have a few minor flaws, which the company soon became aware of!

The minor flaws were effectively rectified some two years later with the appearance of the even more successful HW-101. Like the HW-100, the rig was a lower-cost version of one of Heath's up-market SB-series transceivers, in this case, the SB-102. However, it long outlived the SB-102, which was discontinued in 1975, remaining in production until late 1983. Because the SB-102 is electrically so similar to the HW-101, it's only proper that I include it here.

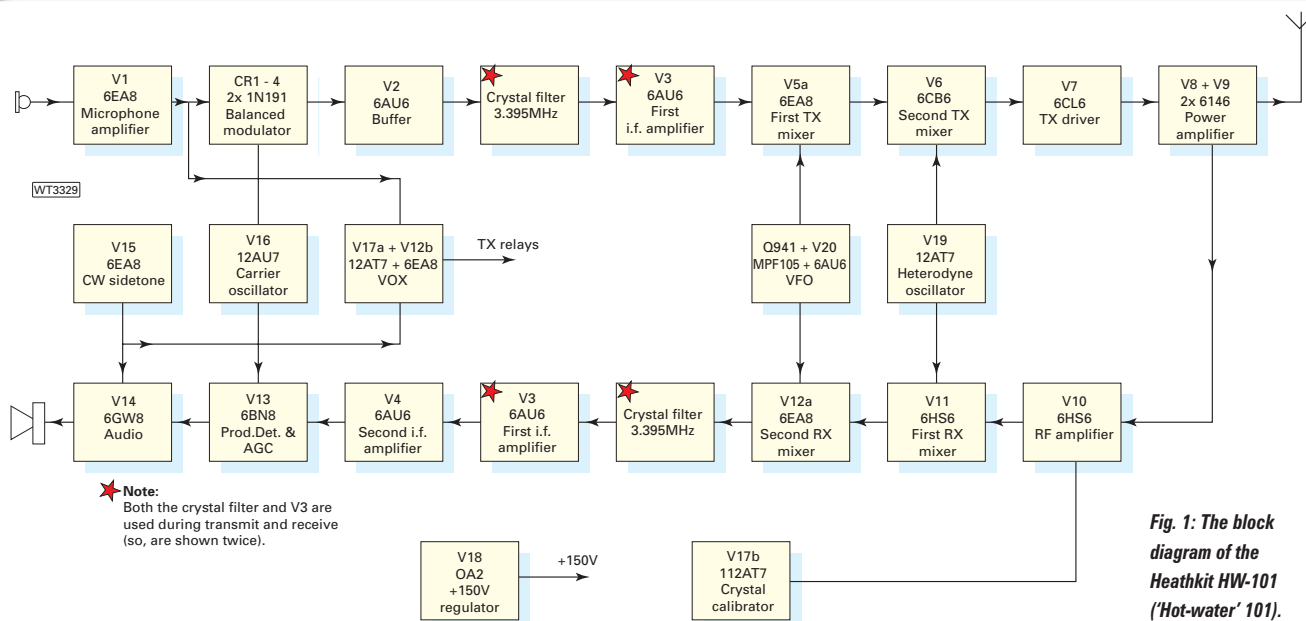


Fig. 1: The block diagram of the Heathkit HW-101 ('Hot-water' 101).

It's a Classic is continued on page 26

Phil Cadman G4JCP takes a break from his Valve & Vintage researches to look at an old favourite from the Heathkit stables. The HW-101 was one of the most popular kits to be developed by the Heathkit factory in Benton Harbor, Michigan, USA.

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palstar ZM-30 Antenna Analyser

ML&S Price
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*UK airspace from March 2005 and for all categories of flights in all other airspace from March 2008.



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Icom IC-7000

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HF + 6M + 2M + 70cms Mobile/Base.

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Fantastic HF + 6M + 2M 100W All Mode Base Transceiver.



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Just superb on all bands 160m-70cm with optional 23cm (X-Version)

RRP: £1699 **ML&S: £1299**



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As TS-480SAT but 200 Watts, no ATU.

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25 Amps maximum, 22Amps constant, ideal for most modern HF Transceivers



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Linear 25-30A 13.8VDC PSU, using a large transformer, twin meters to monitor Volts & Amps. Been on the market for over 20 years in various different brand names and model numbers.



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£239.95

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Only £699.95 for both
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For more information see: www.FT-950.com

Available first (naturally) from ML&S! Price £1199.95

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FT-2000

- Two Versions, 100W and 200W
- FT-2000 100 Watts, 160-6m, Internal PSU
- FT-2000D 200 Watts, 160-6m, External PSU
- Variable RF Tuning & Roofing Filters as standard



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200W and 200 memory channels.

- Tunable frequency: 1.8 - 30 Mhz with long wire antenna from 8 meters
- Input impedance: 50 ohms
- Input power: 10 - 200W PEP
- SWR: <2:1
- Power supply voltage: 12V +/- 10%
- Current consumption: <0.8A
- Auto tuning time: Approx. 2 seconds (first time tuning) Less than 1 second (return to memory frequency)
- Memory channels: 200
- Weight: 1.8 KG
- Size: 310 x 240 x 72mm (L - W - H)

As reviewed by Steve White in Radcom

"A real bargain when compared to its obvious USA competitor" "Well built & performs impressively"

Steve White, Radcom November.



CG-3000 shown with optional remote switch.

NEW! Remote control for the CG-3000. £29.95


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At last! 600W PEP High Speed Remote Tuner from MyDEL

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- SWR: <2:1
- Power supply voltage: DC 13.8V
- Current consumption: <1.5A
- Memory channels: 800
- Auto tuning time: 0.5-6 seconds (first time tuning), less than 0.2 second (return to memory frequency)
- Weight: 1.8 KG
- Size: 365mm x 240mm x 75mm (L - W - H)

ML&S Only £439.95



Nifty Equipment Manuals and Quick Reference Cards for Yaesu, Icom, Kenwood, Elecraft & Ten-Tec radios. See Web for details.

LDG

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LDG Z-11Pro Portable compact & tunes 100mW to 125W **£139.95**

LDG RBA-1:1 & RBA 4:1 Probably the best 1:1 & 4:1 baluns out there. **£29.95 each**


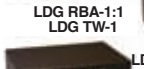


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LDG DTS-4+4R & DTS-6+6R Remote Antenna Switchers. 1.5kW 1-54MHz. Either 4 or 6 way. **£89.90 & £119.90**

FT Meter - External meter Add-on analogue meter for the FT-857 and FT-897. Just plug & go! Enables you to read signal strength. Discriminator, power output, s.w.r., ALC etc. **£39.95**

LDG AT-7000 Specifically designed for the IC-7000! The AT-7000 is the ideal tuner for your shiny new IC-7000. First, it matches up to 10:1 SWR (3:1 on 6 meters), so just about anything you can feed with coax is good to go. And, it has 2,000 (not a typo; that's 2,000!) memories.

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Having many years of experience offering specific finance packages for our customers, we can now offer various options on payment. We have added "Take-Away Now & Pay Later" to all our products over £199. It works like this: 0% APR. An example of our Take-Away Now: Discounted price of £300. Pay no interest provided you pay by the date the amount is due, in full. If you do not settle the original amount deferred within the six month period you will then pay £13.54 for 36 months at an APR of 29.8% TAP £487.44. Please note that interest is calculated from the date of the original agreement. 29.8% APR. E&OE

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Final Advertisement

When the final advertisement for the HW-101 appeared in the Winter 1983 catalogue, Heath announced that more than 30,000 transceivers had been sold. However, it's likely that the final combined figure for both the HW-100 and HW-101, was actually closer to 40,000. Whichever figure you choose, the '101 was easily the most popular transceiver Heath ever made.

The HW-101 is certainly a classic on numbers alone, but it's also based on the classic transceiver design, as can be seen from the block diagram shown in Fig. 1. Interestingly, the HW-101 and its up-market sibling were the last tubed (valved) type transceivers Heath ever made.

There were a few semiconductors used in the design and they were mostly diodes. The exception was the v.f.o. which employed an MPF105 field effect transistor (f.e.t.) as the oscillator (buffered by a 6AU6).

The v.f.o. supply was also stabilised by a 2N3393 transistor acting as a Zener diode! (The v.f.o. in the SB-102 was one of Heath's excellent semiconductor Linear Master Oscillators). At least purists will be happy to know that in both transceivers, the received signal only ever passed through 'tubes'.

For the time (and at the price it sold for) the HW-101 had a very respectable specification. It covered all the (then) Amateur bands between 3.5 and 28MHz, including all of 28MHz (in four 500kHz segments) and was dual-conversion with a genuine crystal filter.

The transceiver ran 180W p.e.p. input on s.s.b. and 170W (50% duty cycle) on c.w. The p.a. produced 100W p.e.p. output on 3.5MHz through 21MHz, and 80W on 28MHz. The Pi-tank output was designed to match a 50 Ω load with 2:1 or better s.w.r.

Unusually, for a low-cost transceiver, the HW-101 had built-in voice operated change-over (VOX) and c.w. side tone (this keyed the rig on c.w. transmit through the VOX circuitry). The transceiver required a high-impedance microphone fitted with a rather strange connector.

Very Clean

By today's standards, the transmitter was very clean, with third order products at least 30dB down (the book doesn't say with respect to one tone or both tones). Drift was good; at only 100Hz per hour after 45 minutes warm up. And the receiver was lively too, with only 0.3 μ V required for a 10dB signal-to-noise ratio on s.s.b. (Much better than the early SB-series rigs).

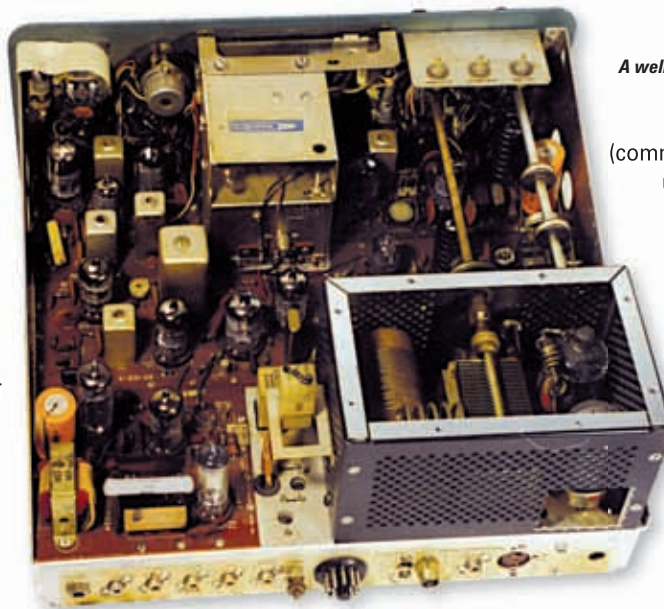
The supplied 3.395MHz crystal filter was 2.1kHz wide at 6dB down and 7kHz wide at -60dB. Not quite up to modern standards but with no noisy synthesiser to mess things up, the receiver sounded quite clean!

The corresponding figures for the optional c.w. filter were 400Hz (-6dB) and 2kHz (-60dB). The audio output stage gave 2W of audio and (as it was a valve operating in class-A) it was much better than a class-B transistor output stage!

Restyled Front Panel

To distinguish the new transceiver from the HW-100, Heath restyled the front panel. It's quite distinctive and quite different to the SB-102, despite all the controls present on the HW-101 also being on the SB-102.

The SB-102 has Heath's elegant single-colour scheme



A well-built HW101.

(common to all the SB series rigs) and uses rotary controls for all front-panel switches (the HW-101 has two slide switches). The SB-102 does have an extra 'frequency control' switch but basically, the front-panel controls are the same.

All the usual operating controls are present: main tuning, band switch, pre-selector tuning, mode, audio frequency (a.f.) and radio frequency (r.f.) gain, microphone gain/c.w. level, meter function, VOX and manual transmit/receive switching (MOX) switching and tune and load controls.

The HW-101/SB-102 had the option of a c.w. filter, so there's a front panel switch to select either the s.s.b. filter or the narrower c.w. filter.

Controls that only require infrequent adjustment, such as the VOX settings and bias adjustment, are accessible with a screwdriver along the bottom right hand-side of the transceiver.

I very much like the completely separate a.f. gain and r.f. gain controls. I'm not keen on dual-concentric controls for such important functions, although with modern physically small transceivers, I appreciate that compromises have to be made.

One quite serious oversight was the omission of a receiver incremental tuning (RIT) control. Given that synthesised rigs were still some way off in the Amateur Radio market, almost everyone was using free-running variable frequency oscillators (v.f.o.s), which were apt to drift much more than modern rigs.

Unfortunately, because of the lack of RIT it was possible for a pair of stations – not to mention a net – to 'chase each other' up the band. An RIT control would have been a big help. Still, if you were keen you could have added one yourself!

On a personal note, I very much like the large size of the front panel controls. Miniaturisation was not appropriate to a kit of this kind, and a physically large front panel demanded physically large controls. But they are a pleasure to use and they don't constantly give you the feeling that they're going to break at the slightest touch! That said, there are no 'bells and whistles' on the HW-101, so there's no need for any extra controls over and above those I've mentioned.

Oh, there's one good point regarding the ALC meter I should mention. Although the meter, which measures ALC, p.a. current and relative power output is quite small, the face is black with white lettering. The pointer is also white and this makes the meter very easy to read, especially when monitoring a.i.c., as the merest flick is easily noticed – even in subdued lighting.

Main Tuning Control

What could be better on the HW-101 is the 'feel' of the main tuning control. But at least it used a conventional ball-bearing dial, unlike the HW-100, which had used Heath's patented Harmonic Drive, and which some operators claimed was full of wobble and backlash. Perhaps this kind of criticism is a little unfair, after all, it was a low-cost transceiver. And Amateur Radio equipment manufacturers are still quite capable of producing tuning controls with an dreadful feel, even to this day.

On the rear there are connectors for a loudspeaker, Morse key, antenna, automatic level control (ALC) input, power and a ground terminal. There's a spare connector too. Apart from the power plug and key jack, all connectors are phono sockets. This

is unheard of today but back then, Heath (amongst others) did seem rather to like phono connectors.

There's no internal loudspeaker, which is both good and bad. An internal loudspeaker is useful but has limited volume and frequency response, a situation that's still largely true today. A half-decent external loudspeaker is a great improvement, so Heathkit owners had no excuse not to use one.

More importantly, there's no internal power supply either. Heath sold the HP-23 (for a.c. mains) and the HP-13 (for operation from a 12V d.c. source) to power both the HW and SB ranges of transceivers. Both supplies delivered the necessary 700V at 250mA, 300V at 150mA, and -115V at 10mA. The HP-23 also provided 12.6V a.c. at 5.5A (The HW-101 only requires 4.75A).

Again, having no internal supply has both advantages and disadvantages, particularly with regard to a kit. Clearly, you could provide your own power supply, probably at a lower cost than buying one from Heath. And if you only wanted to use the transceiver mobile, then you didn't have to pay for a mains p.s.u. that wouldn't be needed.

Cost aside, the absence of a large lump of iron in the transceiver at least made the set relatively light - an important consideration when used mobile. The disadvantage was the thick multicore cable connecting the transceiver to the power supply. Still, one effective solution was to build a combined p.s.u. and loudspeaker, a option favoured by several companies supplying the Amateur Radio market.

Boards & Valves

Inside the transceiver, there are five main printed circuit boards (p.c.b.s) plus four band switch p.c.b.s. There's a total of 20 valves - including two 6146s in the power amplifier (p.a.) and an OA2 regulator - plus an f.e.t., numerous diodes, and a transistor. The circuit design was conventional - for the time - as you can see from the block diagram, Fig. 1.

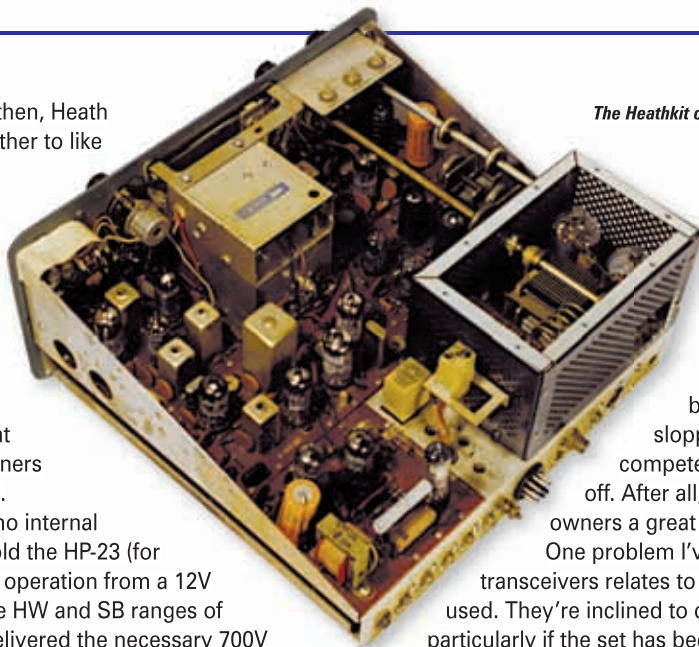
The diagram tells most of the story but I have a couple of comments! There's a band-pass filter (not shown for the sake of clarity) between the first and second transmit mixers. The same filter is also used between the first and second receive mixers, just as you'd expect. Similarly, the crystal filter and V3 are also used on both transmit and receive.

Some of the valves are not terribly common, particularly the 6HS6 (earlier Heathkit rigs used the 6AU6 in the front end), so it would be wise to obtain a spare set of valves if you ever get hold of a HW-101 or SB-102 (or any similar transceiver). At least Heath chose 6146s (still available at sensible prices) for the p.a. and not some television 'sweep' (television time-base) valves.

Not Rare

The HW-101 is not a rare transceiver (not with over 30,000 having been sold) although they're not as numerous in this country as in the USA. From comments I've come across, there were many teenage American Radio Amateurs who were thrilled to find a HW-101 under the Christmas tree, or given to them on their birthday.

It seems many such Amateurs regret selling their 'Hot Water 101s' as they got older and were able to afford more expensive gear. Some are even buying and restoring HW-101s because it was their first serious transceiver. Perhaps they want to relive their youth a little?



The Heathkit chassis provided a stable frame for the HW101.

What To Look For

So what do you look for if you want a HW-101? Build quality (very few were supplied as factory assembled kits) can vary enormously, so please do look 'under the covers' before purchase. Similarly, look for sloppy modifications. However, don't let competently executed modifications put you off. After all, Heathkit rigs were modified by their owners a great deal - just be cautious.

One problem I've come across with the HW transceivers relates to the carbon composition resistors they used. They're inclined to change in value after all these years, particularly if the set has been used regularly. A poorly-performing set may need a few resistors changing.

Similarly, paper capacitors can go leaky, and electrolytic capacitors can go both leaky and low in value. Fortunately, I've not found any real problem with Heath equipment in this respect. Most low-value capacitors used in these sets are ceramic discs, not paper types.

It seems the carrier-null potentiometer can cause trouble and replacement is the only satisfactory option. Additionally, the rubber drive bands can rot, although replacements can usually be found in shops that carry drive belts for video recorders. Corrosion can affect some sets but cleaning all the switch contacts and the v.f.o. capacitor should help.

Expect to have to do some work on any set. If a set looks clean, well cared-for and competently built, then you shouldn't have much trouble. If there isn't a manual with the set, then you can get a copy - at a price. The amazing thing is, these sets can still give a remarkably good account of themselves on the bands today. They're not museum pieces, they can be used every day.

Power Supply

You will need a power supply and with luck, there'll be an HP-23 with the HW-101. As well as the original HP-23, there were also -A, -B and -C variants. All can power the HW-101 (and SB-102) so, the exact model is not important. However, The HP13 d.c. inverter is rather rare here in the UK.

For anyone who wants to copy the HP-23, the specification was as follows: Full-wave voltage doubler in the 750V 250mA (820V no-load) supply (why do the Americans love voltage doublers so much?). There's another voltage doubler in the 250/300V 150mA (275/350V no-load, switchable) supply, with a half-wave rectifier in the -130V 10mA bias supply. The heater winding can supply up to 5.5A at 12.6V. The mains transformer had twin 120V primaries for both 120V and 240V operation.

Very Warm!

One final point regarding the cooling. The p.a. compartment runs warm, very warm! A little forced-air cooling will help prolong the life of both the p.a. valves and their associated components. However, there's no matching fan for the HW-101 so you'll have to improvise. An externally-mounted, 12V computer-type fan ought to suffice, although you'll have to experiment to find the best spot. Whatever you do, don't hack dirty great holes in the case! Many people comment that owning a HW-101 or SB-102 (usually for the second time around) brings back memories of a simpler and more enjoyable time. It's going back to the days when you could fix your own equipment if it went wrong. Maybe these sets are just relics of the 'Golden Age' of Amateur Radio but that's no bad thing. As someone said, "Long live the Green Machine!" ●

How did you get on this year? read on and find out!

The Practical Wireless

144MHz QRP Contest 2007 Results

The Editor, Rob Mannion G3XFD writes: I usually get a great deal of pleasure in preparing this (normally short) introduction – to mark Neill Taylor G4HLX's hard work in organising the contest he originated – and learning the adventures of our intrepid testers. However, this year it's my task to share the sad news that Neill has (very reluctantly) decided to step down as the Organiser and Adjudicator of the contest he set up 24 years ago.

I had realised that because of his long term commitment in a project in France as a Nuclear Physicist, running the contest was becoming difficult. Despite this, I tried to delay facing the reality of the situation by hoping that Neill could hang on for a few more years! However, the day has come where I have – with regret – to publicly announce that Neill will step down as from this year's contest and take a well-earned rest, although he will, of course, try to enter the contest whenever he can! So, on behalf of everyone who takes part in the contest I say a heartfelt 'Thank you' Neill, for all your hard work. Not only did you come up with the original idea – you ran the contest extremely well for 24 years with minimal input from the always busy *PW* offices! Because of this – as a fitting tribute to a great *PW* friend, even though Neill does not seek such acknowledgement – the contest will now be known as The *Practical Wireless* G4HLX 144MHz QRP Contest.

The new contest adjudicator – **Colin Redwood G6MXL** – accepted my invitation to take on the onerous duties from Neill and immediately said, "I'll only tweak the rules if necessary – it runs very efficiently because Neill has organised it so well!"

Personally speaking, I found Colin's statement to be very re-assuring as, in common with most of us, he doesn't believe in fixing something unless it's broken, especially as Neill's organising and adjudicating was superbly carried out over the years! So, in welcoming Colin to his new job (and promising I'll get my locator correct next year!), I'm sure all our testers will wish him well, while looking forward to a sound future for the G4HLX 'fun' contest. Colin's E-mail address is contest@pwpublishing.ltd.uk and his postal address is: **53 Woodpecker Drive, Poole, Dorset BH17 7SB.**

The 24th annual *PW* QRP Contest on the 144MHz band took place on Sunday June 10th, a generally pleasant day in most parts of the UK for those operating portable from hill-tops. With 80 entries – larger than either of the previous two years – stations in many parts of the British Isles were active, as well as much further afield as we shall see.

The overall winner is **Martin Stokes G3ZXZ/P**, taking part as a single operator on Blakey Ridge near Whitby in North Yorkshire, IO94 square. Below him in the results table are a number of entries with similar scores, and after careful checking of the logs, the **North Wales Wafflers GW0CCR/P**, emerge as the runner-up station. This group, who had been the contest winners in 1997 and 2000, were at their usual site near Llangollen in IO82 square. As the winner, Martin receives the *PW* QRP Contest Winner's Cup, while the Welsh Wafflers receive the Runners-up Shield.

In Scotland, the leading entry is that of the **Mid-Lanark Amateur Radio Society MM0GPZ/P**, who receive a special medal presented by **Tennamast (Scotland) Ltd.** The leader of the stations in Eire or Northern Ireland is **Martin Hunter MI0CLP/P**, gaining himself the *PW* EI/GI Trophy Clock, donated every year by the Editor **Rob Mannion G3XFD/EI5IW**.

The other leading positions can be seen in the tables, including the leading station in every locator square. Congratulations to all these leaders, who will be sent a special certificate that also commemorates the 75th anniversary of *Practical Wireless*. As previously announced, the special commemorative certificate is available to anyone who sends in a log for the contest, by sending a stamped addressed envelope (with 50p stamp) to the *PW* offices in Broadstone (see Contents page for address). Be sure to mention your callsign and please indicate whether or not you are a regular *PW* reader.



The station of Jean-Jacques de Rey, F/OT3T, between Cap Griz Nez and Cap Blanc Nez on the French coast.



Andy Foad, G0FTD/P, who titles his entry "1st Whitstable Trolley Platoon" after this interesting trolley arrangement for his portable station.



Tim Raven in action, G4ARI/P.

Dr Neill Taylor G4HLX presents the annual round-up of results and adventures in our 'fun' contest where everybody can join in!

Contest Website

As usual, the full detailed results table will be available on the contest website www.contest.org.uk soon after this issue is published. Thank you to everyone who sent an entry and those who came on the air during the event, whether entering or not. I am also very grateful to **Roger Piper G3MEH** and **David Simmonite M0TWA**, who sent useful check-logs.

Checking of logs is, of course, central to adjudicating the event, so it's a little unnerving to receive a log in which nothing at all can be checked! The rules of the contest **do not actually say** that stations have to be located in v.h.f. range of the UK, so it's maybe surprising that it has taken 25 years for someone from another part of the world to have the bright idea of sending in an entry! It was **Steve Mahony VK5AIM**, who saw a 'loophole' to exploit and being a regular *PW* reader, decided to get a slice of the action! His entry seems to be with a certain amount of tongue-in-cheek but, of course, I have accepted it. However, only his QSOs that took place during the actual times (UTC) of the contest have been counted.

It's rather nice to think that we were boosting 144MHz activity in Adelaide in Australia but because of the difficulties in verifying logs, I'm afraid we will have to close this loophole next year. Meanwhile, congratulations

to Steve for being leading station in PF95 square!

One station outside the UK, who did manage to do very well was **Jean-Jacques de Rey F/OT3T**, who is in sixth place in the results. "I am absolutely not a 'die-hard' contesteer", he writes, but "I found a nice spot along the French coastline (elevation about 165m) from where I wanted to test if competitive conditions would exist in the direction of UK on v.h.f. Our best DX, despite there being no extraordinary propagation on the band that day, was EI2IP with a distance of almost 675km amazing!"

Returning to our own shores, a number of operators were puzzled to have contacts with stations which, according to their locators, appeared to be in the sea! Of course, this was because the stations concerned – there were two of them – had wrongly worked out their IARU Locator. Both are embarrassed about the error so I will not identify them to spare their blushes. In any case, I have corrected the logs of everyone who worked them and re-evaluated scores accordingly.

In fact, few people lost a multiplier for working the station sending an IN89 locator (but really in IO80), since almost all had also worked a station genuinely in IN89, **Chris GU3TUX** on Alderney. However, everyone who hoped they had worked JO04 (a truly 'wet'

Practical Wireless 144MHz QRP Contest 2007

Pos	Callsign	Name	Score
1	G3ZXZ/P	Martin Stokes	4293
2	GW0CCR/P	North Wales Wafflers	3750
3	G4ARI/P	Tim Raven	3591
4	GW8ZRE/P	Dave Hewitt	3562
5	G4RLF/P	Salisbury and District Grand International Transmitting Society (SADGITS)	3536
6	F/OT3T	De Rey J-J.	3354
7	GW0PZO/P	Charlie Jordan	3174
8	G0HDV/P	North East Ex-Pats	3075
9	G6ZYD/P	Andrew Jervis	2997
10	G8VOI/P	Fareham and District Amateur Radio Club	2142
11	G7WAY/P	Stuart Foster / Roger Davis	2033
12	M0UKR/P	Norfolk Mountain Rescue	1995
13	G0EYX/P	Derek and Paul	1960
14	MX0BCQ/P	Craven Radio Amateur Group	1952
15	G3NFC/P	Burton ARC	1900
16	G0OVA/P	Tony Crane	1700
17	M0EUK/P	Graeme Stoker and Keith Morrison	1562
18	G3CWI/P	Real Backpackers Contest Group	1501
19	G1WOR/P	Worthing & District Amateur Radio Club	1496
20	G4NVM/P	John Duddridge	1474
21	G2XV/P	Cambridge District ARC	1368
22	2W1RSS/P	Russ Hark	1332
23	G1POS/P	Jon Page	1296
24	G3BPK/P	Wigan-Douglas Valley Amateur Radio Society	1200
25	G8HXE/P	Keith Haywood	1054
26	MM0GPZ/P	Mid Lanark Amateur Radio Society	1044
27	MW1DOU/P	Ynys Môn - Anglesey LFBG	1020
28	G4MCQ/P	G4EIA / MCQ	1003
29	G8DDY/P	Peter Thompson	944
30	GW3JXN	John Tindle	836
31	G5RV/P	Mid Sussex ARS	832
32	M3NFL/P	Neil Leddington	825
33	G4TJE/P	Clifton Amateur Radio Club	770
34	2W0BYA/P	David Passey	767
35	G8AWO	G8AWO	704
36	G0FUW/P	Steve Hartley	686
37	G4BEE/P	Ray Banister	676
38	2E1SBF	Colin Noon	675
39	M0HBA/P	Hog's Back Amateur Radio Club	588
40	M0TRG/P	Trevellard Radio Group	574
41	G0TUK/P	Steve Tucker and Ian Pomfret	572
42	M0ERG/P	Eagle Radio Group	560
43	G0LJD/P	Brian Howard	533
44	G4VRC/P	Bob Doran	532
45	G1ORC	Oldham Radio Club	506
46	G4AWO	Ron Gray	496
47	GM4YEQ/P	Galashiels and District ARS	448
48	G4JYN/P	Waterside New Forest Radio Club	442
49	G1RCV/P	Cray Valley Radio Society	432
50	G4RYV	David Rumbold	416
51	G7SNR/P	Terry and Dave	405
52	G3UGG	Colin Greenaway	403
53	G0ADH	Bob Razey - Harwell ARS	390
54	G0FTD/P	1st Whitstable Trolley Platoon	384
55	G4LXS/P	Cousinjack Contest Group	374
56	G0NWT/P	North Norfolk Amateur Radio Group	372
57	M3IWR/P	Julian Chapman	325
58	M0CLP/P	Martin Hunter	273
59	G1KHx	David Brooking	264
60	PI4ALK/P	Contestgroup Alkmaar	228
61	M0QVL	Jon Hirst	216
62	G3XBM	Roger Laphorn	210
63	GM0IYP/P	Sutherland & District A.R.C.	200
64	2E0ELC/P	Patrick Hawkins	184
65	2E0TLB/P	Fred Smith	153
66	G0BAK/P	Mr Bill Schofield	147
67	G4SGI/P	Simon Collings	105
68	GM3TKV/P	Moray Firth ARS	90
69	M0BQE/P	Chris Margetts	84
70	EI2WRC/P	South Eastern Amateur Radio Group	77
71	G3WDS/P	Denis Spooner	70
72	G8LJO/P	J. Ricketts	63
73	G7XYZ	The Man from Wem	60
74	M0ERA	Daniel Schlieper	50
75	M0WDC/P	West Devon Radio Club	44
76	GW0TKF/P	Wade Stuart	20
77	GW3BV	Quentin Cruse	15
78	2E0SWZ	Ian W. Swindells	12
79	G7ICV	Simon Hards	9
80	VK5AIM	Steve Mahony	4

Leading Stations

Overall Winner	Martin Stokes	G3ZXZ/P
Runner Up	North Wales Wafflers	GW0CCR/P
Leading Single Operator	Martin Stokes	G3ZXZ/P
Leading Multi-Operator	North Wales Wafflers	GW0CCR/P
Leading Fixed Station	John Tindle	GW3JXN
Leading English Station	Martin Stokes	G3ZXZ/P
Leading Welsh Station	North Wales Wafflers	GW0CCR/P
Leading Scottish Station	Mid Lanark Amateur Radio Society	MM0GPZ/P
Leading Station in Eire & N. Ireland	Martin Hunter	M0CLP/P

Leading single-operator stations

Pos	Call	Name	Score	QSOs	Squ	Loc.	Tx/Rx	Antenna	asl (m)
1	G3ZXZ/P	Martin Stokes	4293	159	27	IO94	TR9130	2 x 11 ele	400
3	G4ARI/P	Tim Raven	3591	133	27	IO92	FT817	MET 14 ele yagi	237
4	GW8ZRE/P	Dave Hewitt	3562	137	26	IO83	TR751E	7 ele ZL Special	561
6	F/OT3T	De Rey J-J.	3354	129	26	JO00	IC-910H	Tonna 9 ele Yagi	170
7	GW0PZO/P	Charlie Jordan	3174	138	23	IO83	FT817	9 ele Tonna	577
9	G6ZYD/P	Andrew Jervis	2997	111	27	IO93	IC706 Mk2G	14 ele Parabeam	424
15	G3NFC/P	Burton ARC	1900	95	20	IO93	IC7000	2 x 9 ele Tonna	300
16	G0OVA/P	Tony Crane	1700	85	20	IO91	IC706 Mk2G	13 ele modified Tonna	75
20	G4NVM/P	John Duddridge	1474	67	22	JO01	FT847	13 ele Tonna	110
22	2W1RSS/P	Russ Hark	1332	74	18	IO83	FT-736R	12 ele ZL special	260

Continued on page 32

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Blue tooth adapter £49.99

£219.99

YAESU FT-7800



2m/70cm + wide Rx. A superb 50W mobile Tcvt. Incl's free in-car kit.

£169.99

YAESU VX-7R YAESU VX-6E



6m/2m/70cm + wide RX. An amazing 6W water proof hand-held.

£199.99

Incls. battery & charger



Tx:- 2m/70cm (0.1-16Hz RX).

£169.95

Includes waterproof case

YAESU BARGAINS

New VX-3E.....£129.99 VX-2E SPECIAL OFFER.....£99.99
MD-200A 8x desk mic£229.99 ATAS-120 antenna.....£219.00

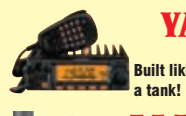


YAESU FT-8900r

10m + 26m + 2m + 70cm. (up to 50W).

£249.99

Yes, only



YAESU FT-2800M

2m FM (65W). Includes DTFM mic

£129.99

Yes, only



ALINCO DJ-596

2m + 70cm Handie. Includes: (NIMH) Battery/Charger. Wide + narrow switchable. High power (4.5W) OP as standard. (DTMF keypad as standard)

Now includes free remote mic **£129.95**

Optional case.....£16.99

Cigar lead.....£19.99

Optional headset (Boom mic)£24.99

NISSEI PWR/SWR METERS



RS-502 1.8-525MHz (200W)

£79.95 P&P £6

RS-102 1.8-150MHz (200W)

£49.95 P&P £6

RS-402 125-525MHz (200W)£49.95 P&P £6

RS-3000 1.8-60MHz (3kW) Incls mod meter.....£59.95 P&P £5

RS-40 144/430MHz Pocket PWR/SWR.....£29.95 P&P £4

DL-30 diamond dummy load (100W max)£26.99 P&P £4

SUPER-GAINER RH-9090



SMA 40cm flexible whip that is ideal as

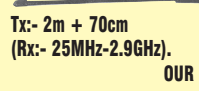
replacement. Tx:- 2m + 70cm.

Rx:- 25MHz-2.9GHz

OUR PRICE **£28.95**

P&P £4.00

SUPER-GAINER RH-9000



BNC 40cm flexible whip

for the ultimate in gain.

Tx:- 2m + 70cm

(Rx:- 25MHz-2.9GHz).

OUR PRICE **£24.95**

P&P £4.00

HF RCV'RS

SONY SW-100E

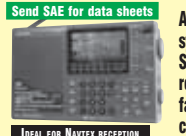


Amazing pocket size all-mode state of the art receiver. 88.108MHz + 0.15-30MHz. This miniature marvel has SSB performance that beats many desk top radios. For that added bonus on AM it has "synchronous AM detection."

Similar in size to a cigarette pack.

£179.95 P&P £10

SANGEAN ATS-909



Send SAE for data sheets

A superb performance all mode synthesized world receiver with true SSB and 40Hz tuning for ultra clean reception. Other features include RDS facility, 306 memories and WFM. Incl's case/earphones/wind-out antenna. A truly remarkable receiver, especially on SSB - you'll be amazed.

IDEAL FOR NAVTEX RECEPTION

Incls free 240V Power Supply

£139.95 P&P £10.00

REALISTIC DX-394



Send SAE for review

★ Superb performance

SW receiver ★ 0.2-

30MHz (all mode)

★ Selectable tuning

steps (down to 100Hz)

★ 240 or 12V ★ Digital

S-meter ★ Attenuator ★ Key pad entry ★ 160 memories

★ Noise blanker.

OUR PRICE **£249.95** P&P £10.00

ACCS

MFJ-259B



HF digital SWR analyser - 1.8-170MHz.

(Optional case £24.99)

£184.99

MFJ-269B HF 70cm analyser£269.99

MFJ-901B Superb versatile ATU.....£69.99

MFJ-902 Compact ATU.....£59.99

MFJ-16010 Random wire ATU.....£39.99

MFJ-260C 300W dummy load£39.99

MFJ-264 1.5kW dumm load£69.99



MFJ-949E

NOW **£110.00**

● 1.8-30MHz 300W ATU ● Large cross needle meter
● 30/300W PEP power meter ● VSWR
● 3-way antenna selector ● Internal balun + dummy load.



MFJ-969

300W **£169.99**

HF + 6m rollercoaster ATU

SGC BARGAINS



SGC MAC-200 New auto tuner 1.8-54MHz (200W) wire, vertical, dipole. You name it.

(5 selectable outputs). OUR PRICE **£239.99**

SGC-239 Mini tower ATU (1.8-30MHz)£169.99

SGC-230 (HF-200W) ATU.....£319.99

SGC-237 HF+6m Tuner.....£269.99

SGC-231 HF+6m (Deluxe).....£319.99

W-8010 DIAMOND TRAPPED DIPOLE



80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain

YES, ONLY **£89.99**

DIAMOND CP-6

A superb (diamond quality) 6 band trap verticle antenna with trap radials - "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m

SEND SAE FOR DATA SHEET

OUR PRICE

£219.99

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

SEND SAE FOR LEAFLET

£179.95

Q-tek wire penetrator (45ft long)£159.99

Standard G5RV

Full size - 102ft (now includes heavy duty 300Ω ribbon)£28.95
Half size - 51ft (now includes heavy duty 300Ω ribbon)£24.95

DELUXE G5RV

P&P on either full/half size £6.50

Double size - 200ft (160-10m)£84.95
Full size - 102ft (80-10m)£42.95
Half size - 51ft (40-10m)£36.95

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end)£25.00 P&P £4.00 (a pair)

In-line "RF" choke balun (for G5RV's).....£32.99

COAX BARGAINS

RG-213 Military spec x 100m.

£99.99 or 2 for **£170.00**

RG-58 Military spec x 100m.

£35 or 2 for **£60.00**

Coax stripping tool (for RG-58)£4.00



True military spec real UK coax

DOUBLE THICK FERRITE RINGS



A superb quality ferrite ring with incredible properties. Ideal for "R.F.I.". Width 12mm/OD35mm. 6 for £12.00
12 for £20.00 P&P £3.50
50 for £40.00 P&P 7.00

LOW LOSS PATCH LEADS



Connectors	Length	Price
PL-259 - PL-259	0.6m	£6.99
PL-259 - PL-259	1m	£7.99
PL-259 - PL-259	4m	£10.99
BNC - BNC	1m	£6.99

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF£22.00

DC-2 Standard 2-pin/15A fits most VHF/UHF£10.00

YAESU REPLACEMENT MICS

MH-IC8 8 pin Yaesu mic (8-pin round)£29.99

MH-4 4 pin fits older HF, etc. (4-pin round)£24.99

COAX SWITCHES (P&P £5.50)



2 way CX-201 (0-1GHz) S0239£19.95
2 way CX-201 'N' (0-1GHz) 'N'£24.95
4 way CX-401 (0-500MHz) S0239£69.95
4 way CX-401 'N' (0-500MHz) 'N'£79.95

METALWORK & BITS

(DEL Phone)

2" mast-floor base plate£13.50

6" stand off brackets (no U-bolts)£6.99

9" stand off brackets (no U-bolts)£9.99

12" T & K brackets (pair)£18.99

18" T & K brackets (pair)£22.99

24" T & K brackets (pair)£26.99

U-bolts (1.5" or 2") each£1.50

8mm screw bolt wall fixings£1.70

8-nut universal clamp (2" to 2")£6.95

2" extra long U-bolt/clamp£4.50

2" crossover plate with U-bolts£11.99

15" long (2") sleeve joiner£11.99

3-way guy ring£3.99

4-way guy ring£4.99

Heavy duty guy kit (wire clamp, etc.)£29.99

Set of 3 powder coated heavy duty fixing spikes (~0.7m long)£24.99

30m pack (4.4m) 480kg B/F nylon guy£12.50

Roll of self-amalgamating tape£6.50

Nylon dog bone insulators£1.00

Very large nylon insulators£2.00

PL-239 (small of large entry)£1.10

N-type plugs (high quality)£3.95

Copper plated earth rod (1.2m long with wire clamp)£13.99

Copper plated earth rod (as above) + 10m earth wire£19.99

CUSHCRAFT BARGAINS Delivery £12.00

MA5B Mini beam 10, 12, 15, 17, 20m. **SPECIAL OFFER** £349.95
A4S 4 ele beam (10 - 20m)£499.99
A3S 3 ele beam (10-20m)£449.00
R-8E Vertical (40 - 6m) "special"SPECIAL £425.00

DIAMOND V-2000 COLINEAR

6m + 2m + 70cm (2.15/6.2/8.4dB).
2 section (2.5m long) PL-259 fitting.
Was £89.95.

Superb quality

Now **£84.99**

Q-TEK COLINEARS (VHF/UHF)

Del £10.00
X-30 GF 144/70, 3/6dB (1.1m)£39.95
X-50 GF 144/70, 4.5/7.2dB (1.7m)£54.95
X-300 GF 144/70, 6.5/9dB (3m)£69.95
X-510H GF 144/70, 8.5/11dB (5.4m)£120.00
X-627 GF 50/144/70, 2.15/6.2/8.4dB (2.4m)£79.95

MOBILE ANTENNAS

Del £8.50

DB-7900 2m/70cm (5.5/7.2dB) 1.6m (PL-259)£39.99
DB-770M 2m/70cm (3.5/5.5dB) 1m (PL-259)£24.99
PL-62M 6m/2m 1.4m (PL-259)£23.99
PL-627 6m/2m/70cm (1.7m) up to 7.2dB (PL-259)£44.99



YAESU G-450C

Heavy duty rotator for HF beams, etc.
Supplied with circular display control box and 25m of rotator cable.

OUR PRICE **£299.99**

G-650Cour price £339.99
G-1000XCour price £429.99
G-5500 (azimuth/elevation) rotatorour price £499.99
GC-065 thrust bearing£48.00
GC-038 lower mast clamps£25.00
7 core heavy duty rotator cable£1.40/mtr



AR788

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable 50p per mtr.

OUR PRICE **£49.99**

AE-201 thrust bearing£19.99

CAROLINA WINDOW

CW-160S (160-10m) 40m long£124.95 P&P £8.50
CW-160 (160-10m) 80m long£129.95 P&P £8.50
CW-80 (80-10m) 40m long£99.95 P&P £8.50
CW-80S (80-10m) 20m long£109.95 P&P £8.50
CW-40 (40-10m) 20m long£89.95 P&P £8.50

BALUNS & TRAPS

Baluns 1:1 or 4:1 or 6:1£29.99 each P&P £4
Traps 80m or 40m or 20m£29.99 pair P&P £4

COPPER ANTENNA WIRE ETC

Enamelled (50m roll)£16.95 P&P £7.50
Hard drawn (50m roll)£16.95 P&P £7.50
Multi-Stranded (Grey PVC) (50m roll)£13.95 P&P £7.50
Flexweave (H/duty 50 mtrs)£39.99 P&P £7.50
Flexweave H/duty (18 mtrs)£18.95 P&P £7.50
Flexweave (PVC coated 18 mtrs)£19.95 P&P £7.50
Flexweave (PVC coated 50 mtrs)£50.00 P&P £7.50
Special 200mtr roll PVC coated flexweave£150.00 P&P £10.00
Copper plated earth rod (4ft)£13.00 P&P £7.50
Copper plated earth rod (4ft) + earth wire£18.99 P&P £7.50
New RF grounding wire (10m pack) PVC coated£12.50 P&P £5
8 core rotator cable (heavy duty)£1.00/mtr
20mm ribbed circular conduit70p/mtr

CAR BOOT MAST SET

Once they've gone, they've gone! 5 section (15') 4.5m 1½" slot together mast set. Collapsed length 0.92m (3') makes this ideal for travelling.

£24.99 Del £10.00

2 for **£39.99** del **£12.50**

FIBRE GLASS POLES

Del £10.00

1m 1¾" £10.50 2" £12.50 Longer lengths available - phone
2m 1¾" £20.00 2" £24.00

MFJ-125



12" Dxr's quartz wall clock. give:- 24hr time + 3 smaller dials give 12 hour time/day of week/date.

£37.99 P&P £6.00

NEW NOISE FILTER!



A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc. Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for **£10.00** or 6 for **£25.00** (P&P £3.50)

D-308B DELUXE DESK MIC



(with up/down). Many amateurs (over 4000) have been pleased with it's performance. Includes 8-pin round Yaesu mic lead. Icom/Kenwood & other leads available. Phone (£9.95ea). Replacement

foam windshield available.

£49.95 P&P £7.50



MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling. (Fits up to 2" mast)£8.99 + P&P £4.50

30m pack (4.4mm) nylon guy rope £12.50

132m roll 4.4m nylon guy (480Kg h/f)£40.00 Del £7.50



BARGAIN WINCH

500kg brake winch. BARGAIN PRICE

£59.95 Del £8.50

Winch wall bracket£19.99

TELESCOPIC MASTS

6 section telescopic masts. Starting at 2½" in diameter and finishing with a top section of ¼" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 8 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs **£139.99** 12 mtrs **£169.99** Carriage £12.00.

NEW 20' SLEEVED MAST SET

A heavy duty-sleeved, mast set that will tightly slot together. 4 x 5' (2" dia) 16 gauge heavy duty aluminium tubes. (Dimensions approx).

£49.99 Del £10.00.

TWO FOR £90.00
DEL £12.50

HEAVY DUTY SWAGED MAST SET

New extra heavy duty 2" mast set. 4 sections x 5½' foot slot together.

£54.99 each.

TWO FOR £95.00
DEL £15.00

ALUMINIUM POLE CLEARANCE

We have sets of 4 (2") poles (3 of which are swaged) that slot together to make a (approx) 20' pole. Each section is approx 5' long - some have small dents in - some have been swaged slightly off centre - hence the price.

3 SETS FOR £69.99 DEL £15.00 SET PRICE **£29.99** Del £10.00

ALLUMINIUM POLES

20 foot (collection only) 2"£44.99

10 foot (collection only) 2"£29.99

2.4m (2") Ally pole24.99

5 foot (2") Ally pole£9.99

SPEAKER MICS



M-U120
Fits most
handies. Alinco,
Kenwood, Yaesu.



Ms-107K
Fits Kenwood
handies.

£14.99 P&P £3.00

£14.99 P&P £3.00

TH-887 HEADSET

ADAPTERS FOR MOBILE TCVRs AVAILABLE - PHONE

Superb headset for most handies.

887K (fits Kenwood) £24.95.

887 fits most twin sockets. Alinco,

Icom, Yaesu, etc. **£24.95** P&P £3



LIGHTNING ARRESTOR



SP-350V Replacement fuses £5.00

DC-1000MHz (400W through power).
S0-239 fitting.

£22.95 P&P £3.00



MFJ-1118 metered

High current distribution unit£64.95



MFJ-1117

DC High current distribution unit£39.99



EP-300 DB-770H (BNC)

Over the ear

earpiece.

£9.95 P&P £2

2m/70cm Tx + wide Rx

£42.95 P&P £4.00

New: 9th edition UK Scanning Directory. Britain's most comprehensive frequency list. £19.75 P&P £5.

Leading multi-operator stations

Pos	Call	Name	Score	QSOs	Squ	Loc	Tx/Rx	Antenna	Ht. asl
2	GW0CCR/P	North Wales Wafflers	3750	150	25	IO82	FT736R	4 x 17 ele Tonna	560
5	G4RLF/P	Salisbury and District Grand International Transmitting Society (SADGITS)	3536	136	26	IO80	TS770	6 ele Jaybeam quad	277
8	G0HDV/P	North East Ex-Pats	3075	123	25	IO93	IC7000	13 ele Cushcraft	100
10	G8VOI/P	Fareham and District Amateur Radio Club	2142	102	21	IO91	IC211e	13 ele Tonna	165
11	G7WAY/P	Stuart Foster / Roger Davis	2033	107	19	IO92	FT847	17 ele Tonna	320
12	M0UKR/P	Norfolk Mountain Rescue	1995	95	21	JO02	IC911	2 x BV02 long boom homebrew yagi	40
13	G0EYX/P	Derek and Paul	1960	98	20	IO82	IC910	17 ele Yagi	150
14	MX0BCQ/P	Craven Radio Amateur Group	1952	122	16	IO84	FT817	9 ele Tonna	500
17	M0EUK/P	Graeme Stoker and Keith Morrison	1562	71	22	IO84	TR9130	7 ele ZL special	600
18	G3CWI/P	Real Backpackers Contest Group	1501	79	19	IO93	FT817	SOTAbeam SB5	552

square, with no land), had really worked IO94 and thus got no multiplier for it, all already having IO94 elsewhere in their logs.

Finding your locator generally starts by (accurately!) establishing the position of your site on a map. Or, of course, by using a GPS system at the site to get a direct and accurate determination, and some GPS units these days actually have an option to display the IARU Locator directly. At the **Mid Sussex ARS (G5RV/P)**, before the contest started, the GPS units were in high demand: "This year we used the other end of the car park that was used last year and there was some disagreement on the correct square to use", they write, "a map and three 'sat-nav's were involved and eventually we discovered that four squares intersected nearby."

First Experience

It's always a pleasure to read of operators who get their first experience of v.h.f. contest operating during the contest. This year, **Wade Stuart GW0TKF/P**, was one, while on holiday in North Wales and picking up a copy of *PW* in a newsagent, made a "spur of the moment" decision to try out his new FT-817 from a hill near Harlech Caste. "I thoroughly enjoyed the experience", he says, "working an EI station on 2.5W using only the small supplied Yaesu 'rubber duck' antenna gave me the most satisfaction. Roll on next year's contest when I will be fully sorted with mast, beam, power supply and food for the XYL!"

Simplicity is sometimes the key to reliable operation! The **Moray Firth ARS GM3TKV/P**, were amongst those having trouble with their more

elaborate installations. "We had the DK7ZB antennas up and down many times to find a fault with them", they report. These home-brew antennas, made by club members, are "14 elements, each 10m long and very difficult to handle with such a small crew" and this was "the first time the two antennas had been tried as a pair". Using a vertical collinear while trying to solve the problem, it was eventually discovered that "the transmitting element box had filled with water; we dried it out over the stove. The contest was nearly over by then".

As many of you know, I myself have been working full-time in France since the end of 2005. Despite my best intentions I could not get back to the UK to be on-air during the contest, so again spent the day fruitlessly on top of Mont Ventoux (JN24 square) in the hope of a lucky opening. No chance, although this year I did tantalisingly hear a station in JO10, which seemed so near and yet so far from the UK!

I have been adjudicating this contest now for 25 years – that's 24 events as we cancelled the contest in 2001, due to foot-and-mouth disease that led to restrictions on access to many portable sites. It's time now to pass the task on to someone else, particularly because my work outside of the UK looks set to continue. So, this year's *PW* QRP Contest will be the last one that I organise. This has led me to look back over the years and consider how things have changed. I then realised that I have never put down in writing the story of the origins of the QRP Contest.

Autumn 1981 Beginnings

It all began in the autumn of

Leading station in each locator square

Square	Name	Call	No. entries
IO62	South Eastern Amateur Radio Group	EI2WRC/P	1
IO64	Martin Hunter	M0CLP/P	1
IO70	Trewellard Radio Group	M0TRG/P	3
IO72	John Tindle	GW3JXN	3
IO73	Ynys Môn - Anglesey LFBG	MW1DOU/P	1
IO78	Sutherland & District A.R.C.	GM0IYP/P	1
IO80	Salisbury and District Grand International Transmitting Society (SADGITS)	G4RLF/P	3
IO81	G4EIA / MCQ	G4MCQ/P	4
IO82	North Wales Wafflers	GW0CCR/P	5
IO83	Dave Hewitt	GW8ZRE/P	10
IO84	Craven Radio Amateur Group	MX0BCQ/P	2
IO85	Mid Lanark Amateur Radio Society	MM0GPZ/P	2
IO87	Moray Firth ARS	GM3TKV/P	1
IO90	Worthing & District Amateur Radio Club	G1WOR/P	4
IO91	Fareham and District Amateur Radio Club	G8VOI/P	10
IO92	Tim Raven	G4ARI/P	3
IO93	North East Ex-Pats	G0HDV/P	5
IO94	Martin Stokes	G3ZXZ/P	2
IO95	Denis Spooner	G3WDS/P	1
JO00	De Rey J-J.	F/OT3T	2
JO01	John Duddridge	G4NVM/P	9
JO02	Norfolk Mountain Rescue	M0UKR/P	6
JO03	Eagle Radio Group	M0ERG/P	1
JO22	Contestgroup Alkmaar	PI4ALK/P	1
PF95	Steve Mahony	VK5AIM	1

1981 when, one lunchtime, I was chatting with a group of friends at the **Harwell Amateur Radio Society** and we were bemoaning the lack of a low-power v.h.f. contest in the British contest calendar. The **Radio Society of Great Britain (RSGB)** had run a 144MHz contest with a 1W power limit in the 1970s but this had been discontinued due, I imagine, to low popularity.

One of those present was **Cliff Sharpe G2HIF**, now sadly gone to that great Field Day in the sky. He was a member of the RSGB VHF Contests Committee and had tried hard to have the 1W event reinstated but had failed.

At that time, highly portable 144MHz single sideband (s.s.b.) or multi-mode transceivers were new on the market and were becoming extremely popular. The sets included the Icom IC-202, the Standard C58 and the Yaesu FT-290R, all with powers of 3W or less. I figured that a contest aimed at the owners of such rigs would be popular, so I suggested that we ran our own contest. Cliff and the others were highly

supportive of the idea, and gave me much encouragement, but were not offering a lot of practical help.

In the days that followed, it occurred to me that to publicise and publish results of the contest we would need the support of a magazine. As *Practical Wireless* had, not long before switched from being a general radio magazine to one devoted to Amateur Radio, it seemed an idea to approach the Editor.

The benefits, it appeared, of running the contest as an independent event meant that we could reach many newcomers to the hobby – and lots of them seemed to have an FT-290 – and give them an experience of v.h.f. contesting that, hopefully, would lead to participation in the many v.h.f. contests in the RSGB calendar. There was, in any case, a precedent for a contest being run by a magazine, with one of the largest h.f. events, the *CQ* World-Wide contest. So, I contacted the then-editor of *PW*, **Geoff Arnold G3GSR**, who liked the idea, and this led to the first *PW* 144MHz QRP



The Moray Firth ARS, operating as GM3TKV/P, lower their antennas in the mist one more time to try to find the fault.

Contest in June 1982.

Apart from the low power limit and the contest being open to everyone, a further innovation was the scoring system. In those days before home computers were common (the ZX81 was then the latest thing), to manually calculate the score of a v.h.f. contest log was quite a chore, normally involving maps with radial rings drawn on them, or with pieces of string. So, to make it easy for newcomers, I proposed the straightforward system we still use today. Multipliers had not before been used in v.h.f. contests in the UK, so it was quite a departure from other contests.

I had no idea how much interest the first contest would attract. It was with some trepidation that I awaited the logs arriving by post, fearing that it would all be a hopeless flop. However, as it turned out, my postman didn't know what had hit him. Privately, I had hoped for 50 entries, in fact I received over 180!

The following year, 1983, we received around 250 logs, and the contest had become the best-supported v.h.f. contest in the UK of all time. We were benefiting from a peak in the popularity of Amateur Radio in



general, fuelled in part by the CB boom.

Most newcomers were starting with a Class B (144MHz and above) licence, very many of them with the FT-290R or similar transceiver and the contest just hit the nail on the head! It was working just as I had hoped, with many newcomers enjoying this taste of v.h.f. contests and going on to join the RSGB and take part in other v.h.f./u.h.f. events.

The thing about receiving so many entries in those early days was that I had to do all the log checking manually. This was a phenomenal task and I began to sink beneath a sea of paperwork during all my free time for about six weeks.

I was determined to meet the deadline to get the results in the November issue of *PW*, far quicker than contest results



Contest group Alkmaar, PI4ALK/P on top of a dune near North Sea Coast, approx. 25 metres above sea level.

Graeme Stoker and Keith Morrison, operating as M0EUK/P.

There was a cheeky entry from VKAIM, the leading station in PF95!

generally arrived in print and this was a challenge for an event with so many entries. Around 1985, I started using a computer program, running on a ZX Spectrum, to keep some records of entries while I did the cross-checking. This program was later developed further and transferred to more modern PCs but still, until entries started arriving by E-mail in recent years, all log checking has been manual with the paper copies.

Eventually, I re-wrote the system using an online database containing all the logs, at last allowing automation of the cross-checking process for those logs that were sent in electronic form. This has helped enormously with the workload, even though I still verify individually every point that the system wants to deduct for an error.

Of course, the number of entries in the contest declined gradually after those peak years, in line with the popularity of Amateur Radio in general.

But numbers have stabilised since about 1996, when there were 81 entries, one more than this year. At some point, we shortened the contest from eight hours to seven, as the level of activity fell but have maintained this duration even if the last hour or two does get rather slow-going for some entrants, because it's during this time that the better operators and/or equipment can winkle out a few extra QSOs and squares to give them the 'edge'.

The technology of the stations taking part in the contest has developed enormously over the quarter-century since we started, although this has been more through the impact of computers than the performance of the radio equipment and antennas. Interestingly, more than one-in-ten of this year's entrants were still using Yaesu FT-290s. And it's good to see callsigns from the early days of the contest still appearing in the results from time-to-time.

Thank You Everyone!

It remains for me to thank the many hundreds of operators who have been behind the stations taking part over the years and to thank entrants for continuing to make this the friendly event that it has remained. I am also indebted to **Colin Redwood G6MXL**, who has agreed to take over running the contest from next year, which will be on **Sunday June 8th, 2008**.

Please make Colin's life as easy as possible by preparing your entries exactly as required by the rules! Who knows, maybe I'll get lucky with the path from JN24 next year, or perhaps even be back in England to take part in the contest myself. Meanwhile, congratulations again to all those who did well in these 2007 contest results.

G4HLX

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Taking a look at The Warrington Amateur Radio Club

Feature

Welcome to the **Warrington Amateur Radio Club's** In Focus session where I'll start with some club history. In the early summer of 1946, following the relaxation of wartime restrictions on wireless communication by individuals, ex-government surplus radio equipment became widely available. At the same time, many servicemen trained in communications and maintenance of radio and radar equipment, were demobbed.

Young men continued to be called up for National Service and they too received technical training that excited their interest. As elsewhere in the UK, there was a surge of interest in Amateur Radio activities here in Warrington in the north west of England between Manchester and Liverpool (You can see Warrington on the map at the landward end of the Mersey Estuary).

Crown & Sceptre

In Warrington, like-minded individuals both licensed Amateurs and short wave listeners (s.w.l.s) met to swap ideas including the formation of a club. Eventually, in 1947 the first official meeting took place at the *Crown and Sceptre* pub.

Little is recorded of about early activities but it's known that the club took part in the Warrington Centenary celebrations and put on a demonstration of mobile radio contacts on Top Band (1.8MHz) from a car driving round the town. Nowadays, it doesn't sound very innovative but was an advanced concept for civilians at that time!

Meetings were held at various venues including pubs, business premises, the Sea Cadet HQ and members' private houses until 1972 when the **Grappenhall Community Centre**



Some members of The Warrington Club waiting for the evening talk to commence in the new accommodation. There are separate areas for the club station (GOWRS & G6WRC) and toilet and washing facilities.

was set up and club members assisted with voluntary work and following this a room was made available as a club shack.

The club has rented a room at the Centre ever since and enjoyed the splendid bar and other facilities on offer. For many years Radio Amateur Examination courses were run at Grappenhall and many of the local successful candidates joined the club. Members now assist as instructors for Foundation and other courses at The Beacons bunker complex.

The Beacons* is a Second World War, well hidden, bunker. The location is Frodsham Hill, 152m (500ft) above sea level a.s.l.). It's a concrete bunker and has been maintained as a Cold War base and because Chester, our County Town, is on the Welsh border and between the rivers Dee and Mersey the bunker provides a view of much of Cheshire and has been used by RAYNET.

**The Beacons will be featured in a separate PW article. Editor).*

The 50th Anniversary

In 1997, to mark the club's 50th anniversary, it was decided to produce a free-to-members club news sheet – *QSX WARC* – and publish it on a bi-monthly basis. The first two issues were in 3-page A4 format but from issue three it became a 12-page (or more) A5 booklet. Publication in colour started in November 2000 – initially only the front and back pages – but soon colour photographs of the club's activities could be featured throughout each issue.

The anniversary also prompted a replacement mast to carry the high frequency (h.f.) beam and the usual tussle with the planning authorities resulted in a requirement to retract the antenna down to roof level when it wasn't in use. Much experimentation led to a virtually fool-proof powered system that can be controlled by the operator at the rig.

It has been a guiding principle that the club equipment



All at sea! The installation party for the Looe Island expedition in 2005.

You may ask, 'Warrington – that's on the Manchester Ship canal isn't it?' To answer the question, in this month's In Focus feature, Ron Davies G0WJX aims to answer the question and ensure you know just where this active club is and what they're up to!



Mike Jackson MOACK (club member) instructing a small group at the Beacons, an old 'secret bunker'.

should be available and user friendly to all qualified members. The line up now is an Icom IC-756PROII feeding a 3-element Stepp IR Yagi for 14 to 50MHz (20 to 6 metres) with the ability to use a Challenger linear amplifier, providing an up-to-the-legal limit power output.

A wire antenna caters for 7MHz (40 metres) until the Stepp IR can be modified to give us tuned 7 and 10MHz coverage. Additionally, while the beam is down for maintenance and adaptation, a 5-band trapped dipole is available and a vertical collinear antenna takes care of v.h.f. and u.h.f.

The 60th Anniversary

For many years, the club's shack has been in a room approached by an external metal staircase, a severe test to anyone with walking difficulties and positively lethal when wet – and **PW Editor Rob Mannion G3XFD** knows it well*! However, we're now all celebrating a move to the ground floor and members have worked hard on the refurbishment of the new location that now includes kitchen and toilet facilities as well as a radio room and a general area for meetings and talks.

We have held a very well attended 60th anniversary social evening with buffet meal (donated by a member) and wives, friends and partners including **Dave Wilson M0OBW** (Radio Society of Great Britain Board member) and **Kath Wilson M1CNY** (Regional Manager) enjoyed a convivial evening in the bar, although **Angus Annan MM1CCR**, the RSGB President, who had hoped to attend, was unable to make it.

By a happy coincidence, the May edition of the club magazine is the 60th, so coverage of the club's social activities, improved accommodation and equipment enhancement is most appropriate.

**Getting up there was like climbing up to a ship's bridge at sea Ron! G3XFD.*

Programme & Facilities

The club shack is available to members at all times except formal meetings, when every effort is made to provide a talk or demonstration. The formal meetings are held every Tuesday commencing at 2000. A committee member is specifically charged with the task of recruiting speakers.

The club is fortunate to have members who are experts in various fields of our hobby. For example, **Dave Roberts G8KBB** was awarded the RSGB's **Ostermeyer Trophy** for his design and construction article in the May 1999 *RadCom*, featuring a Simple Digital Power Meter club project.

Other club projects by members have included a 30A regulated power supply, a monitor 'scope, a QRP Top Band transceiver and a digital interface with the latest being a programmable digital

signal processor. But **Dave G8KBB** is best remembered for his part, together with **Colin Horribin G3SBI** and **George Fare G3OGQ** (also club members), in the design and construction of the CDG2000 transceiver featured in the June 2000 and subsequent issues of *RadCom*.

Considerable Distances

It's no surprise that some club members travel considerable distances to meetings. The club has a range of high specification test equipment together with a comprehensive library of technical books all of which can be borrowed free of charge by members.

Regular v.h.f. nets keep members in touch even if they are unable to attend the Tuesday gatherings and the club website **www.warc.org** is also available as a back up.

As is the case with most Amateur Radio clubs, lady members are rather thin on the ground but that doesn't mean that wives and partners are left out! Mention has already been made of the 60th anniversary party and regular social events are built into the club calendar such as buffet evenings, cheese and wine gatherings. There's also, of course, a club dinner, which is normally delayed until after Christmas when venues are easier to book and less crowded.



A copy of the regular club newsletter QSX WARC, celebrating the club's 60th anniversary.

Club member Albert G3ZHE talking to a larger group in the lecture room.



Hands On Ladies!

It's also not unknown for members to celebrate notable occasions by throwing a party. In 2000, three wives made the erection of the club mast on St George's Island (Looe, Cornwall) possible by hanging on to guy lines on the day before we commenced operations. So, they can really claim some really essential hands on support!

The club opened up St. George's Island to Radio Amateurs world-wide in 1999, 2000 and 2005 as an IOTA location. The 1999 DXpedition was notable because we were entirely self supporting with a petrol generator supplying the power. On the subsequent occasions we were able to use power from the island's generator.

All the equipment and operators had to get to the island on the open boat that's also the authorised ferry, so there was every incentive to make sure all conceivable items that might be needed were on board. Other field events have benefited from the experience gained. Care is taken to ensure that club activities are thrown open to all members and they are all encouraged to participate.

Some years ago, there was concern that WARC membership numbers were falling and the average age was increasing. It was then decided that we should upgrade our equipment, increase our activities and seek more publicity. This has paid off, as new members have joined and whilst we aren't getting any younger the age range has stabilised. We are now facing the future of Amateur Radio in and around Warrington with confidence and if you'd like to join us, please telephone **01925-268096**. You'll be very welcome indeed!

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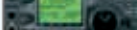
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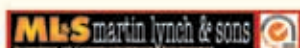
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In the Shop with Harry Leeming G3LLL

Harry G3LLL talks about his favourite antenna and problem switches and solder joints.

What is the best antenna you ever had? was the question posed to me one day. Well - it was a wire and string delta loop, which I built around 30 years ago. Based on the original quad loop antenna installed at HCJB in South America. There, due to the very high impedance and voltages on the ends of a normal beam and thin damp air, corona discharges were causing the ends of the driven element to melt. The quad antenna was conceived as an antenna without ends, to cure this problem.

The high impedances at the element ends of a normal dipole or beam, also explains their susceptibility to nearby objects. The first time I came across a quad loop antenna was over 30 years ago, when I was trying out various v.h.f. beams in the loft. Three and four element Yagis seemed to work almost as well in both directions, being upset by the presence of wiring, water tanks, pipes and other nearby objects. When I tried out a commercial quad loop antenna, its performance didn't suffer to the same extent.

If you want to make a full size rotatable quad loop antenna, check out **Peter Dodd G3LDI**'s excellent article in the June 2007 issue of *PW* or get a copy of the late **Bill Orr**'s book *All about the Cubical Quad*. But if like myself, your mechanical ability is limited, read on.

The delta loop antenna is electrically similar to its four-sided sibling and like it's effectively two stacked dipoles, **Fig. 1**. Due to its shape, however, it can often be mounted on available supports. At my previous home the mountings

consisted of the boom on our f.m. broadcast band antenna, various points on the roof and a very convenient street lamp, sited just inside our boundary!

My first effort was a two-element delta loop for the 14MHz band, **Fig. 2**, which pointed approximately in the direction of the USA. For any beam to function efficiently it has to be accurately tuned and this is where a simple wire beam wins hands down. I first erected the driven element, which I had purposely made slightly too long.

Before attaching the coaxial feeder, I connected the two ends via a one-turn loop. I took a battery powered grid dip meter (accurately calibrated against a receiver) with me on the roof. With this I could check and alter the length of the element until I got a dip at around 14.2MHz. At this point, impatience got the better of me and I connected up the feeder and gave it a try. The s.w.r. was just over 2:1 but as signals from the USA were much up on my G5RV, I used just the loop alone for a few days with excellent results.

The next move was to add a reflector. According to most authorities the loops should be about 2.5m apart at top and bottom but as my boom was

only half that in length, my initial trial had the loops spaced 2.5m at the bottom but only 1.2m at the top. I tuned the reflector to about 13.8 MHz by adding a little under a metre of extra wire at point 'X' until I got resonance with the dip meter and 'wow'.

The s.w.r. came down to almost unity and the signal reports I got were fabulous. As at this time, 14MHz was the only band that was usually open for transatlantic traffic, I was satisfied – well for the moment anyhow. Like *Oliver Twist*, however, before long I wanted more. How about another direction? But that will have to wait until next time.

A Stitch In Time

Bert, started to hear a fizzing sound when he was tuning up his FT-101ZD. Sensibly he removed the covers. Then, darkening the room, he had a look in to see what was happening. Flashes were coming from one of the rear sections of the mode switch,

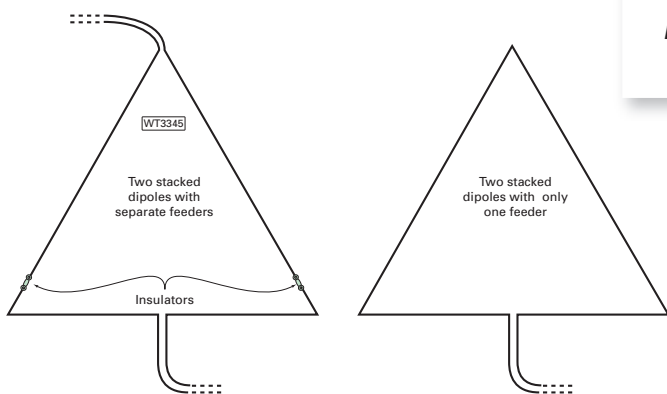


Fig. 1: The delta loop antenna can be considered to have been developed from stacked dipoles.

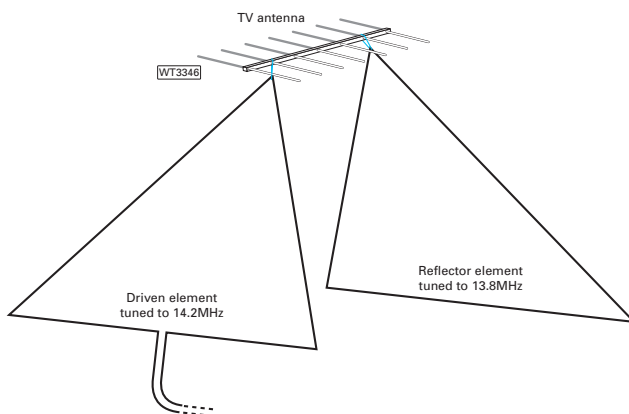


Fig. 2: Using the boom of the TV antenna meant that the tops were much closer together than the bottom runs.

inside the p.a. stage's screened cover. He rang me to ask if I had a new switch; I hadn't but I advised him that if it was not too badly damaged, I could probably save it.

A typical power amplifier stage may only give out 100W or so but if anything goes wrong that's more than enough power to cause considerable damage. Sparking at switches soon results in burning. I've come across many rigs that were in need of expensive repairs or damaged beyond economical repair, just because someone did not stop and

think when they heard or smelled something unusual.

Fortunately, little damage was obvious on Bert's rig but there were intermittent flashes from the wiper of S2b to the chassis. This is quite a common fault on the FT-101ZD but if it can be caught before too much damage has been caused.

The switch was originally wired as shown in **Fig 3(a)**, with the wiper going to the high voltage end of the p.a. coil, with up to a kilovolt of r.f. on it. It seems surprising that Yaesu have wired it this way, as the insulation on the outer tags of the switch is much better than that on the wiper. The dodge is to rewire the switch as per **Fig 3(b)**. This takes the high voltage away from the wiper and providing that the switch has not been burnt, restores the rig to normal operation.

A Lazy Rig

Herbert brought his FT-200 to me, complaining that the push-to-talk (p.t.t.) operation was very sluggish. He 'confessed' that he had tried cleaning the relays but that this had not helped. I stripped the rig down and sure enough all the relays were full of lubricant.

Unlike rotary switches, the contacts on relays do not slide over each other and so don't need lubricating. If switch cleaner that contains a lubricant is applied, the lubricant will form a layer on the contacts once the cleaner has dried and as time goes by this will become sticky. When the relay then operates the contacts will either fail to make or they will take their time to sink through the residual 'goo', hence the delay in operating.

Cleaning Your Relay

One of the best ways to clean a relay is to remove it, wet it with a switch cleaner that does not contain a lubricant, one such as Servisol 'Aero-Klene', available from **Maplin**, (video head cleaning fluid will do at a pinch) and then to pull a suitable thickness of feeler gauge though the contacts. If it is not possible to remove the relay, apply the cleaning fluid and then quickly operate the push to talk or whatever other control operates the relay, many times. Herbert's relays were in such a mess that first I had to remove them from the board, take them out into the fresh air

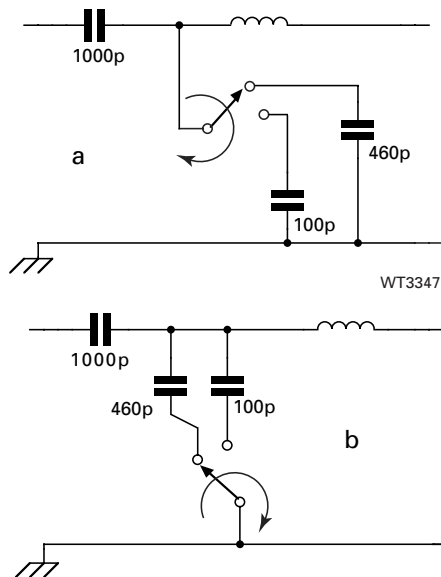


Fig. 3: The original layout of the switch above and an improved rewiring layout that eliminates flashover.

and swirl them with liberal amounts of cleaner.

Note: Many types of cleaning fluid should not be used indoors, as the fumes can be toxic. **Even with cleaners that are not flammable, do not smoke when using them, as this increases their toxic effects. Avoid using Carbon Tetrachloride, as this is really dangerous and can damage your liver.** Whatever you use make sure first, that the cleaner does not attack the relay's plastic. (Yes I once poured cleaner onto a valve holder and watched the plastic melt!)

A Friend's TS-930

The ham spirit is still alive and to prove it I received the following very interesting E-mail from **Tom Ellinor**, describing the work that he had carried out on his friend's very poorly TS-930. Tom wrote: "When we last spoke by E-mail I was just starting to sort out a friend's TS-930. The display failure and loss of front panel control turned out to be all down to lots of poor solder joints on the digital card. I took these cards out completely and re-soldered most of the connections.

"In the original process of manufacturing of the board, something was wrong with the solder, it hadn't adhered to the component or the track at all well. It's worse, when you try to re-heat the joint, the solder drew away from the connections. So, I cleared and re-soldered many of the joints.

"Another problem this radio had, was in the power amplifier (p.a.) area. The driver transistors in the p.a. block were blown up and it's a 28V supply. A lot of the modern driver transistors, (mainly 12V working) are unsuitable without major modifications

Harry Leeming G3LLL

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Heysham
Morecambe LA3 2PQ
Tel: (07901) 932763
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Harry's waiting to hear from You!

As I am now retired, I like to hear about problems with older equipment, particularly pre-1990 Yaesu rigs. If you want a direct reply please remember to send me your E-mail address or enclose a stamped addressed envelope. Send your letters to the address above.

Remember the mains supply is potentially lethal. Unless you really know what you are doing, always pull the mains plug out, do not just switch off at the wall socket, when working on equipment.

to the board. There would have to be additional supply regulators, for which there is no space. I eventually got a pair of the original 28V devices from the USA.

"The other fault that I found when I looked at the radio was that the internal auto antenna tuner didn't tune. Having looked at it I couldn't find anything wrong. The problem only came to light after I'd repaired the transmitter p.a. and I found that I couldn't get more power out than a few hundred milliwatts. So, I started to check the path loss between the p.a. and the antenna socket.

"It turns out that after the auto a.t.u. there is a diode and relay Tx/Rx switch mounted right on the back of the antenna socket. On receive, a relay connects the antenna to the receive path, on transmit that relay just goes open circuit and a diode is forward biased to provide the transmit path. However, the diode bias is via a couple of inductive chokes, one of which was open circuit. The auto a.t.u. was hence trying to tune into a virtual open circuit and that's what I reckon killed the p.a. devices."

Rig Written Off?

Many of us would probably have written off the rig as beyond economical repair, with even the first of these faults. I've heard stories of owners being told, to maintain some sort of operation, to permanently remove the memory battery and then give the rig a 'bash' if it plays up. Certainly to do all of the above work in a workshop on a commercial basis would have resulted in a bill well over £500.

Now, that's the kind of friendship and enthusiasm we all need!

Antenna Workshop

John Heys G3BDQ describes an antenna design for medium sized gardens that can work well on the h.f. bands.

A simple description of a 'V' antenna could be: 'a doublet with its ends drawn together'. Each leg of a horizontal 'V' antenna can be thought of as a pair of long wire antennas and that the two legs can provide directional gain over the doublet when each leg is at least one wavelength long. The element pair is arranged with an included angle that's dependant upon the number of wavelengths in each leg.

I hope the description above isn't too confusing as there are two variables involved. To get maximum gain, the angle between the legs of the antenna may range from 90° (for legs one wavelength long), down to 35° when each wire is eight or more wavelengths long. The antenna to be described here, has a leg length of at least 15m (50ft) and although it's relatively small, can still be used effectively on all bands from 1.8 to 28MHz.

At 28MHz, each leg of the 'V' will be almost two wavelengths long and so, can have a gain of about 4dB over an half-wave dipole. In the 21MHz band, the gain falls slightly to around 3dB. The radiation pattern in the horizontal plane is off the apex and the open end of the V.

On the lower frequency bands, ie. 3.5, 7 and 10MHz, the radiation will be fairly high angle and tend to be 'all round'. As the number of wavelengths in each leg of the 'V' increases, the vertical angle of the radiation falls, a feature that enhances long distance communication.

My version of the antenna, as described in this article, slopes down towards the open ends of the V, which further lowers the radiation angles on the higher frequency bands. With a horizontal 'V', the vertical angle of radiation is quite low, at 31° when the leg length is only one wavelength.

The radiation angle reduces to about 23° when using legs that are three-wavelengths long. The radiation angles are reduced further when the antenna slopes but it means that the angle is raised in the direction away from its apex and feedpoint.

A long wire has most of its low-angle radiation off and away from its ends. The 'V' antenna with each leg fed out-of-phase, allows the end-lobes of the two wires to be combined. To achieve maximum gain, the included angle of a 'V' must be chosen to allow the end lobes to coincide perfectly. My version has a compromise angle between the wires of 60°, an angle that still allows respectable gain figures on the bands higher than 14MHz.

On the lower frequency bands the angle (when using such relatively short legs for the 'V') becomes irrelevant for there's no gain expected at those frequencies. The choice of a 60° angle is also useful when planning a practical version, for the two antenna wire legs and the distance between the ends of those legs make up an equilateral triangle. This helps in the decision of leg length and whether the antenna will fit into the space available. A

sloping 'V' with 15m (50ft) legs will obviously need a garden of at least this width.

Other Bands

What about the other, lower frequency bands you may ask? The answer is that even when the antenna has no gain over an half-wave dipole, the sloping 'V' will still prove to be an efficient radiator, with its higher radiation angles giving useful signal strengths for short and medium distances. On the 3.5 and 7MHz bands this antenna should be useful

for working most European countries. It should also on occasions during winter months, even allow real DX.

Feedpoint Impedance

The impedance at the apex-feedpoint of the V, will vary with both frequency and the layout of the antenna. On some bands the feed-point impedance will be more manageable but it may also be as high as 2kΩ on other bands! This rules out using coaxial cable as a feeder, a balanced two-wire feeder is essential for this antenna, which can be a home-brew ladder line with insulated spreaders or the commercially available plastic 300 or 450Ω ribbon feeder. Commercial feeders usually have rectangular holes along its length to reduce some of the effects of rain or snow.

An a.t.u. used to match into this antenna will need a balanced output capability, which rules out almost all the commercial auto-tuners. **Note:** It also certainly rules out the internal a.t.u.s of many transceivers. In the latest MFJ Catalogue I did see that a few of their very extensive a.t.u. range were designed with a balanced antenna connection.

Practical Points

Now, for some practical points about siting the antenna. At the feedpoint, which is at the apex of the 'V', the antenna must be at least 9-12m (30-40ft) high and the two shorter supports at the far ends of the antenna can be between 2.5-3m (8-10ft) high. This will give a slope angle of around 30° for the antenna wires. Instead of a support mast at the feeder end of the V, part of the house such as a chimney stack or a small pole fastened to a wall could be used.

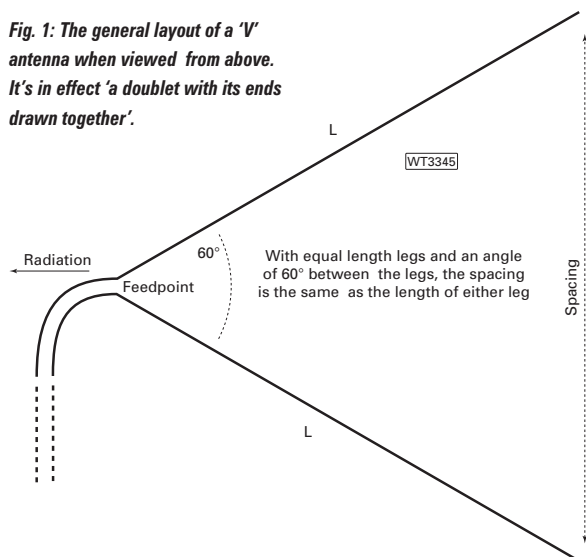
The feeder should come down almost vertically and be kept away from any metal masts. If an insulated mast (such as a fibreglass one) is used, then the feeder can come down quite close to it. The shorter end masts will not need guying if they are set well into the ground, for the weight of each wire leg is not great.

I would suggest that in this design, and in fact in most wire antenna designs, 1.5-2mm (18 or 16s.w.g.) copper wire is used. This should be hard drawn to prevent stretching and will avoid the nasty problems that can be associated with multi-conductor wires encased in plastic.

Once used, the wires will become tarnished from weathering, despite the insulating cover and will be difficult to solder if they are used again for a new antenna project. Incidentally, I have known of several cases where the inner wire strands have broken because of windage and this break was hidden by the plastic insulation.

The breaks gave rise to a mysterious

Fig. 1: The general layout of a 'V' antenna when viewed from above. It's in effect 'a doublet with its ends drawn together'.



situation where a previously good antenna suddenly became untuneable. My present long wire has some copper wire along its length that was purchased more than 40 years ago and despite some 'greening' from my local sea air still performs perfectly.

The antenna as described is suitable for medium sized garden plots but if you are fortunate enough to have access to a large garden or field a 'V' can be constructed with much longer legs. If the antenna legs were about 80m (265ft) and the angle between the legs was reduced to 50°, the 'V' would have 7dB gain over a half wave dipole on 14MHz. On 28MHz this gain would rise to 9dB despite the included angle not being correct for the antenna length.

It often happens that the combination of antenna and feeder lengths can give rise to tuning problems on one or more bands. It is because the two lengths can together present the a.t.u. with an extreme (low or very high) input impedance. I've encountered this problem many times and the solution is to change the feeder length by experiment. It's obviously easier to lengthen the feeder down at the shack end.

My present antenna has this problem on 3.5MHz and as it's a single wire radiator, I inserted a coil in series with it and the a.t.u. on that band. The 'V' antenna will

work beautifully on 1.8MHz if the feeder wires in the shack are 'strapped' (shorted) together to become a top loaded vertical. Used with a good earth system it should give an excellent performance for local and even DX work in the winter months.

My own personal experience using a 'V' antenna goes back to an early National Field Day (NFD) 56 years ago, I arranged for three 91m (300ft) wires arranged to work as two 'V's each having a 60° angle at the apex. A special multi-wire home-brew ladder line was switched before connecting to the a.t.u. and when using just 10W input to a 6L6 valve on 14MHz

Finally

Finally, this is an ongoing project as *PW's* editor **Rob G3XFD** is experimenting with a sloping 'V' antenna and to date has had

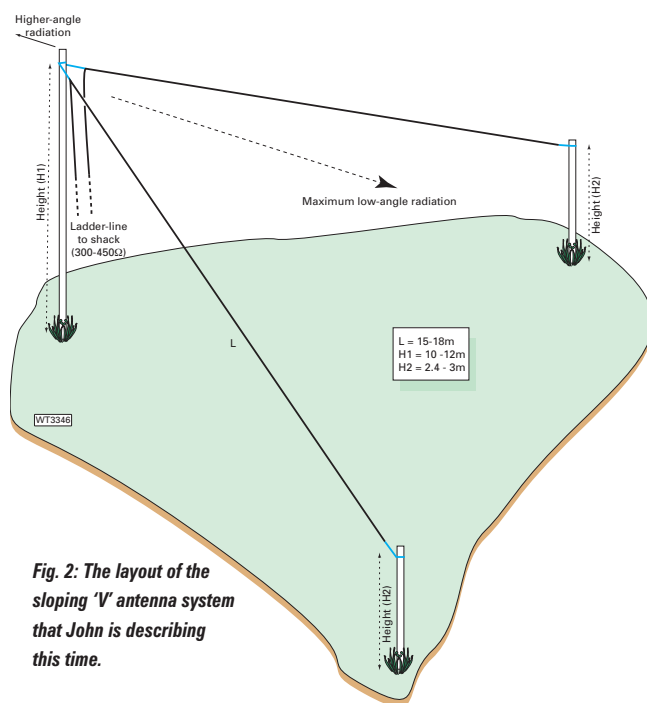


Fig. 2: The layout of the sloping 'V' antenna system that John is describing this time.

considerable success. He will no doubt tell the readers of his findings when they are completed. If you aspire to a little 'one upmanship' and have received a particularly good report tell the chap at the other end that your antenna is an untermated half-Rhombic, a statement that's actually quite true!

Even More Out of Thin Air

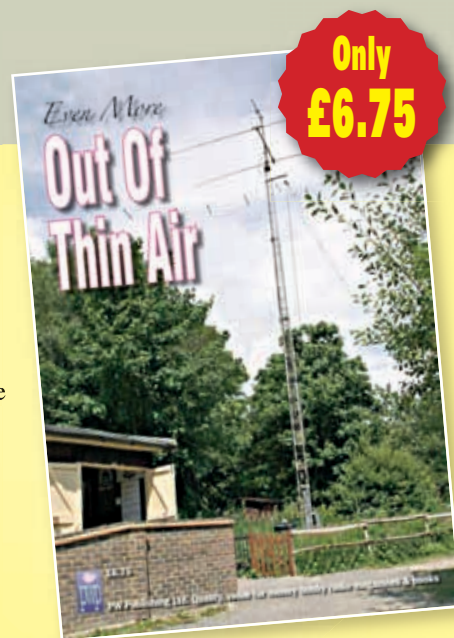
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It's here! - *Even More Out of Thin Air* (EMOTA) is the latest collection of antenna related articles to be published by PW Publishing Ltd. The *Practical Wireless* team know that readers have an insatiable appetite for antenna articles so, to keep that appetite fed we have selected even more of the best!

All the articles, which appear in *EMOTA*, have been published in previous issues of *PW* and are collected together for your enjoyment, as a single point of reference and to encourage you to get out there and start experimenting. All the antenna systems featured in *PW* have been practically proven by their authors and will give you plenty of new ideas to try out as well as reminding you of old favourites you'd forgotten about. The book is divided into three sections within its 80 pages, covering, h.f. designs, v.h.f. designs and theory.

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Carrying on the Practical Way

This month, the Rev. George Dobbs G3RJV describes a 'Hartley Receiver' and, of course, there's an appropriate quotation!

Rev. George Dobbs G3RJV

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"Feedback is the shortest word in the English language that contains the letters a,b,c,d,e and f. Don't forget that feedback is one of the essential elements of good communication." Thinkexist.com

Thinkexist.com

Well – feedback is certainly an essential element in radio communication. Without feedback we could not have oscillation and without an oscillator we could not have radio communication!

Last month, I discussed and tried the classic method of inductive feedback used in the Hartley oscillator. During my research for the Hartley oscillator, I found that the Hartley transmitter was the classic design of the late 1920s and early 1930s and many valve and vintage fans in present times are replicating these early designs.

You may have heard of the 'glowbug' builders. Glowbug is a word used by amateurs in the USA to describe a simple home-made valve (tube as they would say) radios reminiscent of the short wave radio building craze of the 1920s and 1930s. I had toyed with the idea of following up my article on the Hartley oscillator with an attempt at a Hartley glowbug. I was beaten by the constraints of time – perhaps we'll try in the future?*

**Please do so George! Many of us have tried this idea out ourselves without success. I'm sure COTPW readers will enjoy the challenge. Editor.*



Hartley Receiver

I then recalled a nice little receiver design based upon a Hartley oscillator. Some years ago, when I was attending a radio convention in the USA (**HamCom 1999** in Arlington, Texas) with **Graham Firth G3MFJ** and **Tony Fishpool G4WIF**. They put me to shame by both entering a regenerative receiver design for a construction competition that had passed me by. Tony's design was called *The Two Dollar Regen* and used the principle of the Hartley oscillator.

Luckily, I still had the supporting paperwork and E-mailed to ask Tony if I could use his design in *PW*. He kindly agreed so what follows is my version of the *Two Dollar Regen*. Tony gave a lot of the credit for his design to the late **Doug DeMaw W1FB**; the legendary QRP project

designer. My version includes elements of the G4WIF design and the W1FB original design.

The circuit of the Hartley receiver is shown in **Fig. 1**. Readers will recognise the Hartley oscillator from the coil with a feedback tapping point. The regenerative detector uses a 2N3819 j.f.e.t. device. This time, I have chosen a common UK type as some readers have complained of my frequent choice of the MPF102 as my preferred j.f.e.t. in projects. The MPF102 would also work in the circuit. Note that the pin-out of the 2N3819 is different from that of the MPF102.

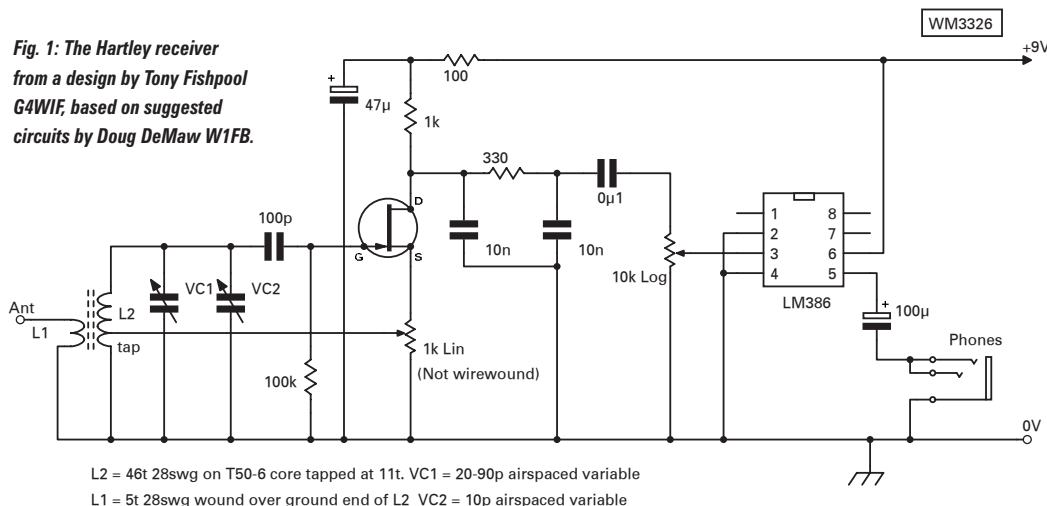
A 1k Ω linear track potentiometer is placed in the source of the j.f.e.t. This is to control the amount of feedback signal available at the tapped point of the coil. It should be a good quality potentiometer

as this control is crucial to the smooth working of the receiver. Both of the 1K Ω potentiometers I found in my stock were rather old – so my feedback control was a scratchy and noisy.

For really smooth control of the feedback, a ten-turn potentiometer could be used but these can be expensive. In his project, G4WIF soldered a shaft onto a miniature multi-turn preset potentiometer. This is rather tricky but is a good cheap alternative.

The tuning circuit is provided by L2 in

Fig. 1: The Hartley receiver from a design by Tony Fishpool G4WIF, based on suggested circuits by Doug DeMaw W1FB.



conjunction with VC1 and VC2, with VC1 as the main tuning capacitor. I found a nice air-spaced capacitor with a built-in reduction drive and a capacitive range of about 15 to 90pF. Readers can use whatever decent quality air-spaced capacitor they can find of a similar range but a reduction drive is really needed for VC1.

If the chosen variable capacitor does not have an integrated reduction drive, one of the common in-line epicyclic drives could be used. I added electrical fine tuning (bandspread) by including VC2 (a smaller value variable capacitor). I found one with only three vanes and roughly a 10pF capacitive range. In this arrangement VC1 provides coarse tuning and VC2 gives tuning to allow more accurate tuning of individual stations.

In the past, I have described a cheap and cheerful alternative to a small value variable capacitor for band-spread tuning using a carbon track potentiometer. The value of the potentiometer is not important as the method uses the physical length of the track to replicate a capacitor and the potentiometer does need to have a metal case and preferably be quite large.

The potentiometer is bolted to the metal front panel and the casing provides one side of a capacitor. The centre (wiper) tag and one of the outer tags are joined together and connected to the top of VC1. Rotating the control electrically alters the length of the track and gives the effect of a small value variable capacitor – it's a crude idea but it does work!

Winding The Coils

By far the most difficult part of building this receiver is winding the coils L1 and 2. So, I'll now describe how I made my own coil windings. To start, cut about 850mm of 28s.w.g. enamelled copper wire and begin winding L2 from the ground end. Each time the wire passes through the core counts it as one turn.

I usually make about five turns at a time, then push them to lie side-by-side, hold them in place with my thumb and continue the winding. After 11 turns, pull out some of the wire at right angles to the side of the core. Form a loop of wire about 20mm from the winding and twist the wire loop to hold it in place. Then I add the remainder of the 46 turns.

At this stage, I usually hold the ends of the winding in place with a tiny piece of tape over the end wires and melt some beeswax on the tip of the soldering iron, allowing it to drip over the winding. It can be spread around the winding by gentle application of the soldering iron.

Then, I usually take about 150mm of the same wire and add five turns over the first winding between the ground end and the

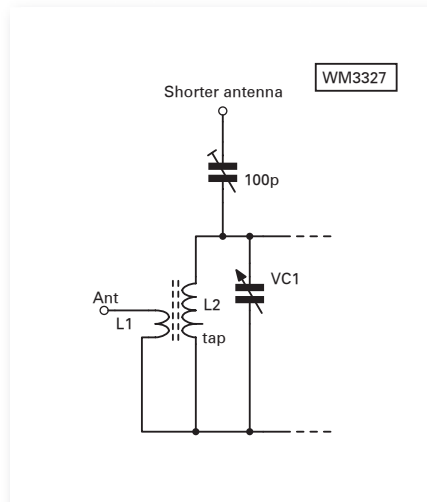


Fig. 2: A longer wire antenna should be fed to L1 and 0V. A shorter rod antenna is better connected directly to the top of L2.

tapping point. This makes the L2 winding and I re-melt that portion of the wax to hold L2 in place.

The two windings and the tapping point need to make good electrical connection, so the enamel coating must be removed and the wires tinned with solder. Some enamelled wire is made so that the heat of the soldering iron will melt away the coating. I never trust this property, so I always gently scrape off the enamel with a modelling knife before applying the hot iron and some solder to tin the wire.

I also untwist some of the tapping wire (leaving only about two twists remaining) to hold it in place as it's easier to clean and tin un-twisted wires. Coil winding is always a bit fiddly – but quite therapeutic – until the phone rings when you're counting turns!

The output from the drain of the 2N3819 goes to a simple resistor-capacitor filter and then requires some audio amplification to bring the signals up to listenable levels. The G4WIF receiver used a 741 op-amp stage to amplify the signal but I opted for something simpler; an LM386 audio chip in its most basic configuration.

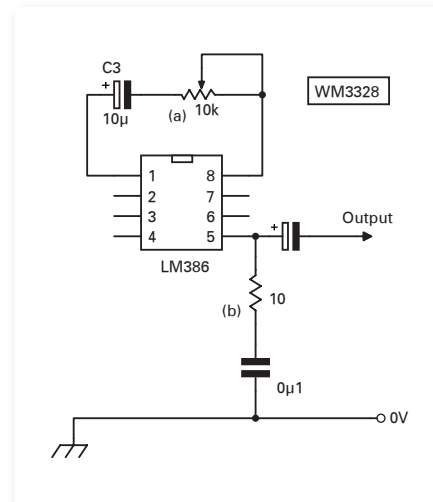
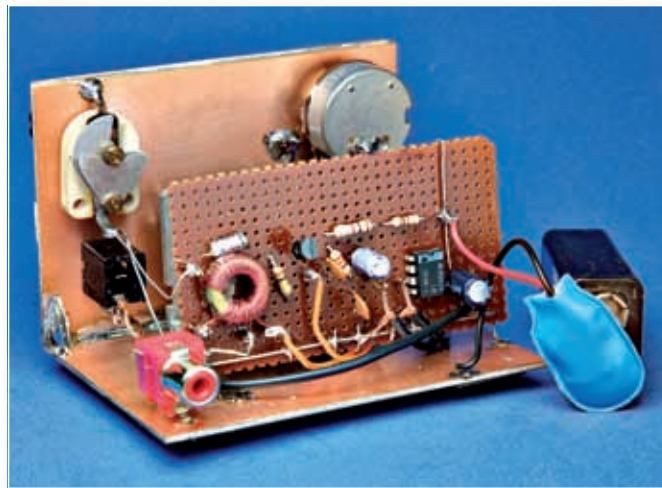


Fig. 3: Overall audio gain may be increased with a capacitor between pins 1 and 8, the RC network on pin 5 improves stability.

The basic circuit gives only about 20-times audio gain but it proved to be enough to drive a pair of portable cassette player headphones and the circuit diagram, Fig. 1, shows the amplifier simply wired to drive stereo headphones in parallel.

Careful Driving Required!

Like all regenerative receivers this project does require careful driving. The regenerative control is set just below the point of oscillation for amplitude modulation (a.m.) signals and just above oscillation for c.w. (Morse) and single sideband (s.s.b.) signals.

The inductor, L1, is designed to accept a 50Ω impedance antenna but if only a few feet of wire is being used for an antenna it's best connected as shown in Fig. 2. **Note:** With a shorter antenna more audio gain may be required.

The LM386, as shown in Fig. 1 is running at its minimum gain and Fig. 3 suggests some improvements and Fig. 3 shows how a capacitor added between pins 1 and 8 can increase the gain. Simply adding the 10μF capacitor would increase the gain to 200. The arrangement

shown will allow gain adjustment between about 30 to 200 times. However, if the gain is being increased it's advisable to add the filter shown between pin 5 of the LM386 and 0V to aid stability.

The little receiver was fun to build and fun to use. It doesn't require many parts and can be built in an evening – so why not try it?

Tuning a 'Slim Jim' Antenna

The 'Slim Jim' antenna must be the most popular of the simple antennas of all time. In my experience, I've often found that a Slim Jim out-performs other simple dipole or ground plane antennas. There is, however, one small inconvenience that's often found with most Slim Jim antennas. And that's an inherent inability to be easily tuned and matched. The mechanical construction for the antenna often makes trimming and alterations to achieve a low s.w.r. a little difficult.

I've usually found that when the correct dimensions are used, the s.w.r. of the antenna will be below 2:1. But there are some cases when the s.w.r. will be different for various reasons. The usual reasons are due to small differences introduced by construction materials or due to constructor error. There's also those instances when the antenna is affected by it's surroundings.

The latter case of mismatching, often occurs when the antenna is used as a temporary system, when hung from a wall-fixture or trees. perhaps, it's been poked outside an hotel window or such like. Some rigs, like my Yaesu FT-817, can be quite fussy about the matching, bringing in a protection system. These rigs prefer the utopian resistive match of 50Ω, though my IC-706 MKIIG appears less critical. But with all of these problems in mind I found a simple solution - a bit of 'tin' foil!

Have a look at the illustrations, which show the foil placed around either the surrounding housing (usually a tube) or 'crunched' around the often-used element, often made from 300Ω twin-feeder. In both case, the foil acts as a capacitor. By varying the position or the dimensions of the new capacitor, the antenna impedance can be changed enough to provide a suitable match into 50Ω coaxial cable.

When using this new capacitor, there's no need to alter either the physical dimensions or the feed-point on the lower 'legs'. My experience is that there's no change to the antenna's performance and both the rig and its operator can feel at ease. Examples of tuning sleeves are shown in the photographs of Fig. 3 and Fig. 4, which incidentally was very difficult to illustrate.

Trying to show some 300Ω feeder properly, required some ingenuity to find a suitable background. For this purpose, I wish 300Ω feeder came with a choice of colours to make photographing it easier!

Don't forget that you'll probably need to experiment with the size of the foil as well as it's position for the best effect. This little trick isn't a catch-all for all s.w.r. problems when using a Slim-Jim antenna but it will form another trick in your tuning armoury.

Happy tuning ●



Fig. 1: A 144MHz antenna, in its plastic water pipe support, stood against the shed door.



Fig. 2: A closer look at the foil capacitor on the antenna of Fig. 1.



Fig. 3: A smaller ribbon cable antenna for u.h.f. work.



Fig. 4: a closer look at the tuning 'sleeve' capacitor of the antenna in Fig. 3.

Andy Foad G0FTD shows you how to improve the popular Slim Jim antenna, by wrapping metal foil around it.

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Valve & Vintage

Ben Nock G4BXD is on duty in the vintage shop this month and takes a look at a French made transmitter receiver and an American Military Intelligence set from the Second World War

Hello once again as it's my turn at manning the *PW Valve & Vintage* shop! There's been plenty of action since I last put pen to paper, with several new additions to the 'Kidderminster Kollektion' (KK) and plenty of restoration work undertaken on existing projects.

As mentioned in the September issue, I attended the Friedrichshafen rally in southern Germany, a very nice event situated in a very nice part of the world. It had been 10 years since I last attended and I have to say that although the venue in the new halls was super the actual content of the show, the amount of surplus and even Amateur Radio gear in the flea market was far less than before.

Despite the fact that there was less equipment on sale, I did (as readers might expect!) manage to find enough bargains to fill my car full of sets and no doubt this exercise will lead to me having to replace the springs yet again! I'll be discussing some of those purchases in future editions. So, it's time to see what's in stock in the shop this month.

French Saram Set

The French Saram set arrived in the KK as a result of the German trip but was in fact

collected from a friend on the return trip. This French-made transmitter-receiver had a role similar to the R1155/T1154 of British fame. The set, **Fig. 1**, made by the Saram company has the designation 0-12.

The transmitter (in the centre) uses two valves, type PE1/15, as the oscillator and power output, the receiver is top right and is a four valved (2 x 6K7 and 2 x 6F7) tuned radio frequency (t.r.f.) design. Being an early continental set the tuning dial is calibrated in metres and not mega or kilohertz with a tuning range of around 1200 to 43m (250kHz to 6.9MHz approximately).

The box beneath the receiver is the rotary generator to power the receiver (everything runs off 24V d.c.), while the large generator on the left powers the transmitter with 700V. The box at the front (right) is the microphone amplifier using two valves, while the housing on the top of the transmitter is the main control box where the microphone, headphones and Morse key are connected.

The real delight for me was that the Saram set came with all the plugs and cabling needed to get it going. I have started restoration work on the unit and I'm now waiting for decent warm weather to start spraying the cases!



Fig. 2: Internal view of the Saram transmitter.

The transmitter was complete internally, **Fig. 2** but was missing the output tuning drive but – amazingly – a fellow collector in central France had a spare, which he kindly sent and I'll be fitting it soon. The receiver was also complete, **Fig. 3**, except for two missing valves.

While there's quite a quantity of Second World War German sets around, it seems there is little in the way of French sets of that period. Even the French collectors tell me they have very little stock of these sets, which makes it all the more interesting to acquire this example in such a complete state. Interestingly, I have even been contacted by a French Military museum, who are producing a CDROM on the French Signals from 1914 onwards, wanting pictures of the set. I'll bring you more information on this next time I'm in the shop.

American Military Intelligence

Another recent addition is a set made for the United States Military Intelligence services, the PRC-5 receiver transmitter, **Fig. 4**. This is a set that was introduced around 1944 and consists of a five-valved receiver and a two-valved transmitter. The unit has a steel front panel to which, **Fig. 5**, are bolted the transmit and receive chassis. The transmit chassis also carries the power supply unit and the set can be run off either 110 or 220, via a switch on the front panel.

The single conversion superhet receiver has two bands, tuning 4.5 to 8MHz and 8 to 16MHz. A beat frequency oscillator (b.f.o.) is provided for Morse reception but the really strange thing is the tuning dial! I have never seen a set with such a poor system as this.

The tiny tuning knob, just to the left of

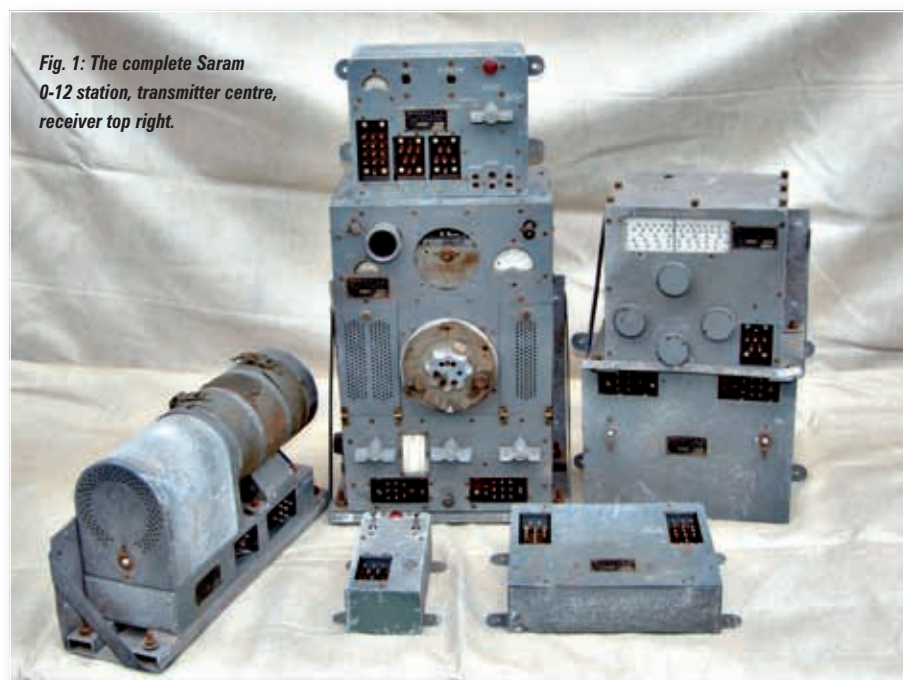


Fig. 1: The complete Saram 0-12 station, transmitter centre, receiver top right.

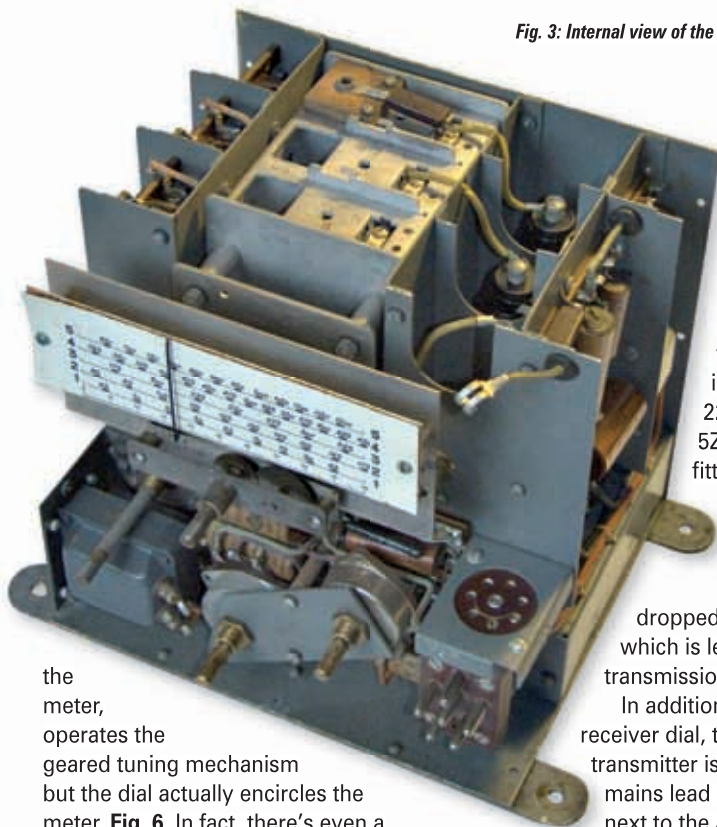


Fig. 3: Internal view of the Saram receiver.

the meter, operates the geared tuning mechanism but the dial actually encircles the meter, Fig. 6. In fact, there's even a cut-out in the case of the meter (top centre) to allow the dial to be visible. I am at a loss as to how this daft idea was dreamed up and although I've seen many odd tuning dials on radios over the years – this must take first place as the weirdest.

The transmitter, offering wireless telegraphy (W/T) Morse only operation, uses a 6V6 valve as crystal oscillator and a 6L6 as power output stage. The operating coverage is from 4 to 16MHz using a set of two plug-in coils over four ranges. The oscillator and power output coils are interchangeable and a total of four coils are used, type B, C and two D types having 32, 24 and 14 turns respectively. The transmitter operates on fundamental frequencies, i.e. the crystal frequency is the same as output frequency, up to 8MHz,

above that the power output stage acts as a doubler.

The power unit has a transformer with twin 110V input windings and these are connected in series to permit 220V operation. A 5Z4 rectifier valve is fitted and produces around 450V for the transmitter. The non stabilised voltage supply is resistance dropped to feed the receiver, which is left running during transmission periods.

In addition to the rather strange receiver dial, the layout of the transmitter is rather crude. The mains lead inputs the set right next to the antenna and earth terminals and the receive-transmit knob is extremely difficult to grip. The actual T-R wafer switch also has an off position and the mains is also switched by this control so (when going from receive to transmit the mains supply is momentarily interrupted. The power output tuning controls are also very close to the actual tank coil and it would very easy to brush against this coil when tuning the transmitter and get a radio frequency (r.f.) burn.

The radio was originally supplied in a wooden box and this had a flap at the top allowing access to the various accessories, headset, key, wire and so on. The radio could also be housed in a larger

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cloth covered plywood suitcase. The set I acquired had neither but by a stroke of luck I remembered I had the wooden box from an item of test equipment.

Incidentally, I made a bet with my family that it would half an inch too small – and I lost as the box was a near perfect fit! There's even a small door in the side of the box, originally to replace batteries, which I can use to house the accessories.

I gingerly applied power to the set using a Variac transformer and monitored the voltages as the set warmed up. All seemed well, there were no obvious short circuited capacitors and the like. However, as a precaution, and to improve performance, I replaced the de-coupler capacitor in the receiver. With the set working, a tweak of the tuning was attempted but I felt there was something odd with the results. After studying the circuit diagram I surmised that the set must be aligned on the higher band first, then the lower band.

The transmitter worked first try – although the oscillator tuning is a little critical. It's unfortunate the PRC-5 doesn't cover the 3.5MHz (80m) Amateur band, so a 7MHz (40m) crystal was used. I managed to get 15W of r.f. out of the set into my dummy load, which is very encouraging and I look forward to trying the set on the air soon.

And Finally!

Well that's about it for this stint at the V&V shop. I hope you have enjoyed the selection I have served up for you. I'll also be pleased if it has wetted your appetite for things old and valued. As always I can be contacted direct at: **62 Cobden Street, Kidderminster, Worcestershire DY11 6RP** or via E-mail at **military1944@aol.com** or even by using Skype now at **Militarywirelessmuseum**. Cheerio for now.



Fig. 4: The PRC-5 receiver transmitter, note the two coil units.



Fig. 5: Internal view of the PRC-5, transmitter on top, receiver below.



Fig. 6: The strange tuning dial of the PRC-5.

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VHF DXer

This month, David Butler G4ASR takes a look at your v.h.f. reports and has news of a 4048km 'Tropo' contact on the 144MHz band.

David Butler G4ASR

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Propagation was quite good on all v.h.f. bands during August. Sporadic-E (Sp-E) was still evident on the 50MHz band with openings every day during the month and there were also six days of multi-hop transatlantic propagation to North and South America.

There was a noticeable reduction in Sp-E openings that reached the 70MHz band but DX was still being worked on most days during the period. Disappointingly, only one 144MHz Sp-E event was reported during August. However, the lack of rain (at last!) and the general improvement in the prevailing weather systems did allow some excellent tropospheric (tropo) openings to be created.

The 50MHz Band

Turning first to your reports of activity on the 50MHz band and I note that the band was open every day during August, with nearly 70 DXCC countries being contacted from the UK. The month kicked off with a transatlantic opening on August 1st that occurred between 1230-1600UTC.

Propagation was very much up and down but stations situated over large areas of England, Scotland and Wales reported making QSOs up to 6200km away in North America. Some of the contacts included the stations of W4SD (South Carolina EM93), W9DR (Florida EL86), NP3CW (Puerto Rico FK68) and the maritime mobile station UT1FG/MM sailing through wet squares GL63 and GL64 approximately 4800km from the UK.

Sporadic-E (Sp-E) propagation was excellent on August 5th with openings between 0800-1300UTC to ES1HJ/0 (Estonia), OH5XO (Finland), SM3JLA (Sweden), SP2DX (Poland), YL2GB (Latvia), CT1AOZ (Portugal), EA6/M0DLL (Balearic Islands), EA7/G8LZG (Spain), EA9IB (Ceuta), IF9/IK1RGM (Sicily) and 9H1SIX (Malta). Just after 1300UTC, there was a brief appearance of Canadian stations VE1PZ and VE1YX but these faded out within the hour.

Between 1400-1600UTC the 50MHz band was open all over the place with stations in Scotland making contacts with TA7OM (Turkey), stations in England reporting QSOs with CT1EC (Portugal), EA5NZ (Spain) and TF2JB (Iceland) and Welsh stations working EH8ACW/P (Canary Islands).

The transatlantic path then opened up again with s.s.b. contacts being made between 1600-1700UTC with stations that included VE1YX, VO1MP, W1JJ, W1LE, W1RA, W3EP, N5BLZ and W5OZI. Propagation then returned back to Europe for the next two hours with QSOs being made in a generally northerly direction into Denmark, Estonia, Finland, Latvia, Lithuania, Sweden, Hungary and Ukraine. At 1850UTC a large scale transatlantic opening to both North and South America commenced and this was to last for over three hours.

Stations in all UK regions reported working some really choice DX, which included D44TD (Cape Verde), FG5GP (Guadeloupe), FM5AA (Martinique), J79PAK (Dominica), KP2BH (Virgin Islands), KP4EIT & WP4NIX (Puerto Rico), PJ2BVU & PJ4/PA3CNX (Netherland Antilles), P43A (Aruba) and YV4DDK, YV5ES & YV4DYJ (Venezuela).

Additionally, the beacon stations of **OX3VHF** (Greenland 50.045MHz), **VO1ZA** (Canada 50.038MHz) and **9Y4AT** (Trinidad & Tobago 50.015MHz) were also reported.

The 70MHz Band

It's a known fact that as you move up in frequency the occurrence of Sp-E openings diminish and so it was the case with the 70MHz band during August. Although there was a noticeable reduction in Sp-E openings there was still some very good DX to be found on the band. Many stations with a permanent 70MHz allocation were contacted and included those of CT1FFU, CT1FFU and CT1QP (Portugal), LX1JX (Luxembourg), OY4TN and OY9JD (Faroe Islands), OZ1DOQ, OZ8ZS and OZ9AEG/M (Denmark), S51DI, S56OL and S57A (Slovenia) and 9A1HCD, 9A2SB and 9A6R (Croatia).

Unfortunately, there are still many European countries that have no transmit access to the 'four metre' band. Some enthusiastic Amateurs, however, do have receive capabilities that enable cross-band contacts to be accomplished typically between the 70 and 50MHz bands. Your reports indicate that such contacts were made in August with the stations of DL3YEE (Germany), F5DQK (France), HA1FV (Hungary), LA4ANA (Norway), LZ1ZX (Bulgaria), OE5MPL (Austria), OH1ZAA (Finland) and SP9HWY (Poland).

Italian Radio Amateurs recently obtained temporary permission to use three 25kHz-wide frequency slots centred on 70.100, 70.200 and 70.300MHz and this experiment, which ends on December 31st 2007, has created a great deal of activity.

Sp-E openings to Italy were reported on 10 days during the period with UK stations reporting c.v. and s.s.b. QSOs being made with IOJX, I3VWK, I5MXX, I6BQI, IK0CKM, IK0FTA, IK0NOJ, IK0OKY, IK2AQZ/P, IK4PMB, IK5MEN, IW0FFK, IW5AUU, IZ5EME, IZ6GSB and IT9JLG.

The experimental station of **DI2AL** operated by **Joe Kraft DL8HCZ** (CT1HZE) also obtained a temporary allocation that allowed him to transmit on 69.995MHz ± 1.4 kHz. Unfortunately, his last day of operation was on September 8th but Joe did manage to make a number of UK contacts via Sp-E and meteor scatter (m.s.). His first contacts into the UK were made via m.s. on August 7th with the station of GM4ISM at 1023UTC and MW0HMY at 1030UTC.

During an Sp-E opening between 1200-1400UTC on August 14th the station of DI2AL made contacts with G4IGO (IO80), G7CNF (IO81), GM3NKG (IO85), GM4FAM (IO77) and GM4ISM (IO85). In a short opening that occurred between 0740-0750UTC on August 23rd a few contacts were made with the stations of G0CHE (IO90), G3VYF (JO01) and G4FUF (JO01).

Although the station of DI2AL is no longer operational, the good news is that **Klaus DL3YEE** (Germany JO42) has received a temporary licence valid from September 1st to October 31st that allows him to transmit on 69.995MHz. The photograph, **Fig. 1** shows the v.h.f. antennas at his QTH. You now have less than two weeks to work a new one on the 70MHz band! If you want really up-to-date news of everything happening on the 70MHz band the only way to achieve it is by looking on the Internet at <http://www.70mhz.org>.

The 144MHz Band

The final 144MHz Sp-E opening of the 2007 season was reported between 1300-1330UTC on August 1st. The station of Joe Kraft CT1HZE (Portugal IM57) mentions making s.s.b. contacts with



Fig. 1: The v.h.f. antennas at the QTH of Klaus DL3YEE.

G4DCV (IO91), G4EAT (JO01), G4FUF (JO01), G4LOH (IO70), G4PBP (IO82), G4RRA (IO80) and M0IKB (IO94).

Conditions must have been quite intense, as **Angus Young M0IKB** (Yorkshire) mentions that he only runs low power from a Yaesu FT-817 transceiver into a home-made 9-element Yagi located inside the roof space. **Paul Pasquet G4RRA** (Devon) reports that although he uses a pair of 10-element Yagis antennas, his tower was tipped over and the dipole elements were only a little way above the ground. At the time of the QSO he was only running 1W output so, he was pretty pleased!

The 144MHz opening marked the last of the summer Sp-E season. The first 144MHz Sp-E opening in 2007 was reported on May 13th followed by two more openings on May 27th and 28th. During the following month there were 13-days of Sp-E openings that occurred on June 2nd, 5th, 6th, 9th, 13th, 14th, 16th, 19th, 20th, 22nd, 24th, 25th and 26th. Conditions deteriorated somewhat during the following month with only seven events being reported on July 4th, 6th, 8th, 9th, 14th, 15th, 24th and one on August 1st.

A total of 35 DXCC countries were worked from the UK, comprising of Austria (OE), Balearic Islands (EA6), Belarus (EW), Bosnia (T9), Bulgaria (LZ), Canary Islands (EA8), Ceuta (EA9), Corsica (TK), Croatia (9A), Czech Republic (OK), Estonia (ES), Finland (OH), France (F), Greece (SV), Hungary (HA), Italy (I), Latvia (YL), Macedonia (Z3), Malta (9H), Moldova (ER), Morocco (CN), Poland (SP), Portugal (CT), Romania (YO), Russia (UA), Sardinia (IS0), Serbia (YU), Sicily (IT9), Slovakia (OM), Slovenia (S5), Sovereign Military Order of Malta (1A0KM), Spain (EA), Sweden (SM), Turkey (TA) and Ukraine (UR).

The best DX of the season was probably the s.s.b. contact made on July 9th between

G8GXP (IO93) and EA8BEX (IL27) over a 3077km path. However, the 24 days of openings this year really didn't compare to last year (2006) when we enjoyed 36 days of lengthy openings from May 12th to August 13th with a total of 40 DXCC countries being worked from the UK.

Tropospheric Openings

I've mentioned on many occasions that Sp-E propagation isn't the only way of working very long distances on the 144MHz band. At many times during the year, tropospheric (tropo) paths form to allow contacts up to 1000km or so to be established at 144MHz and higher frequencies. Tropo paths over water are much more efficient than over land. That's because the ground topography often disrupts the enhancements caused typically by temperature inversions.

There are two main sea paths from the UK. These are either across the North Sea to Scandinavia or, in a south-westerly direction to Portugal and Spain. The latter path offers more DX capabilities as many stations in southern England, Wales, Scotland and Ireland have a pretty clear shot towards the Iberian Peninsular, the Azores and Canary Islands.

This year has been a very poor season for Atlantic tropo openings, as the jet stream stayed south of the UK all summer long causing heavy rain and flooding. It wasn't until August that tropospheric conditions significantly improved. During the weekend of August 4th and 5th, there was an international 144/430MHz contest with a number of high power contest stations active from good locations.

Propagation was very favourable to the south of the UK and the 144MHz station of C33IU (Andorra JN02) was one of the first to be spotted on the DX Cluster as soon as the contest had started. Many stations in southern England were able to work C33IU

as signals were often peaking 59 over a path of around 950km.

A large number of Spanish stations were also contacted on the 144MHz band including those of EA1CFA (IN53), EA1FDI/P (IN52), EA1MX (IN73), EA1QS/P (IN63), EA1UU (IN83), EB1DNA/P (IN63), EC1DMY/P (IN82), EE1URO (IN62), EA2BFM/P (IN83), EA2CLU/P (IN93), EB2GJK/P (IN93) and EB3JT/P (JN01). Some of these stations were also contacted on the 430MHz and 1.3GHz bands at distances up to 1300km.

Tim Fern G4LOH (IO70) has a very clear path to the south from his QTH in Cornwall. On August 2nd he tried a c.w. tropo test with the station of **D44TD** (Cape Verde HK86) over 4000km away. It was being operated between August 1st - 8th by Frank DL8YHR and Norbert DL8LAQ primarily to operate a 144MHz moon-bounce expedition station. Their equipment consisted of two 10-elements Yagis and a high power valved amplifier. Tim heard nothing from D44TD but apparently the group heard G4LOH for a 'short while' with 429 signals.

Some more tests were carried out on August 3rd with fragments of signals being heard at the QTH of D44TD. Tropo propagation on August 4th was very good and at 1817UTC Tim made an s.s.b. QSO with the station of EA8AVI (Canary Island IL28) over a 2600km path. Another tropo test with D44TD was arranged to start at 1824UTC on 144.185MHz.

Weak but intermittent signals were heard almost immediately but it took until 1853UTC before G4LOH had received enough of the call signs and a nice 45 second sequence when he copied a 419 report. Immediately, he started to send a R319 report and then at 1910UTC he copied a series of RRR's via meteor enhancement that signified that the QSO was complete. This amazing c.w. contact over a path of 4048km was likely to have been achieved via tropospheric propagation with meteor enhancements.

On the following day, the tropo duct that had supported the QSO with D44TD had drifted north to the Canary Islands producing some strong signals from stations active in the international contest. The c.w. and s.s.b. contacts made from the 144MHz station of G4LOH included EA8BFFK (IL38) at 2499km, EA8BWY/P (IL18) 2575km, EA8BPX (IL18) 2589km, EA8ACW/P (IL28) 2599km, EA8TJ (IL18) 2600km and EB8AYA (IL18) also at 2600km.

Deadlines

That's it for this month. The autumnal tropo season will now be evident so listen carefully on the v.h.f. and u.h.f. band for any DX signals. If you hear anything or have any other news then please send the details to me before the last Saturday of each month.

73, David G4ASR

Share your news, views and reports with fellow readers. Reports to Carl by the 15th of each month please.

HF Highlights

This month, Carl looks at the first years of Amateur Radio and rounds up your reports on the h.f. bands.

Carl Mason GWOVSW

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I begin this month's column with an E-mail from *PW* reader **John Cook G0DPC** from Southend on Sea who said "Just a quick line to bring to your attention the launch of a new free toolbar for ham radio and s.w.l.s called *HamInfoBar*. I designed it after searching for a toolbar for my own use but surprisingly found very little in this area. I have regular contact with a large number of Radio Amateurs and have received very positive interest and feedback.

"If like me you feel this toolbar would benefit Amateurs and s.w.l.s then a mention in your column would be very welcome. I am constantly looking for ways of improving it and any suggestions your readers have would be very welcome". Consider it done John! You can find full details and a download for the toolbar at www.haminfobar.co.uk/

The DX News

On to some DX news now and to Egypt where **Kutasi Gabor HA3JB** will be active as **SU8BHI**. He will be in Cairo until the November 30th and plans to operate c.w., RTTY, SSTV, PSK with some s.s.b. on most h.f. bands and will also participate in a few contests. The QSL route is via the bureau or direct to **PO Box 243, H-8601 Siofok, Hungary**.

In the Pacific Ocean, **Ulrich Krieg DL2AH** will be active on 7 to 28MHz s.s.b. and RTTY from Niue Island **ZK2/DL2AH** OC-040 until October 12th and from the Chatham Islands OC-038 callsign **ZL7/DL2AH** between October 16th and 30th, before moving to Norfolk Island OC-005 using the call **VK9ANH** from November 1st to 14th.

Those of you who collect maritime mobile QSL cards will be interested in the call **DP0MSM**. This is the official callsign of the Amateur Radio club station on board the *Maria S. Merian*, a German research vessel currently on its way from Longyearbyen, Svalbard to Kiel in Germany. The crew includes four licensed Amateurs **Frank Riedel DJ3FR**, **Martin Tomiak DL7ARY**, **Hermann Pregler DH1HP** and **Steffen Meinecke DF1MSM**. (DP0MSM can be used only when the ship is in International waters).

If they're not in International waters, the crew members will have to use their personal callsigns with the '/MM' suffix.



Fig. 1: Elgin M0ELG in his shack.

Your QSL cards for any contacts should go through the DARC bureau. You may be interested to know that you can track this and other vessels through www.sailwx.info/shiptrack/shipposition.phtml?

In Ecuador, **Marcos Suarez EA1APV** will be active as **HC1/EA1APV** from Cotacachi until October 20th. He will operate on most h.f. bands when time allows as he will be working full time on a project of International co-operation. All QSLs can go via his home call or direct to **PO Box 90, E33080 - Oviedo, Spain**.

Finally, the special callsigns **R100AK** and **R100IF** are being used to commemorate the 100th anniversary of the birth of Amateur Radio veteran **Alexander Kamalagin UA4IF**. Information on an award for working these stations can be found at www.samaraham.ru/main.php?d=awards/ua4if_memory_eng and QSL cards for both calls should go via **RW4HB** either through the bureau or direct to **Serge Golobokov, PO Box 37, Samara, 443099, Russia**. The award manager is **Vladimir Stepnov RW4HO, PO Box 6830, Samara, 443010, Russia**.

Operators Needed

If you fancy taking part in a six-day DXpedition to Cocos Island (T19) NA-012 in February 2008 and can operate s.s.b., c.w. and digimodes, then look up www.ti9.eu.com or www.qsl.net/ti2hmg/cocos.htm where operators are being sought. That could be an interesting way to start off the New Year!

Pirate Alert

It would appear that another European pirate is causing a few problems across the pond! **Edward Gable K2MP/W2AN** says that an operator calling himself 'Bill' is pirating his W2AN callsign somewhere here

in Europe on the 1.8 and 3.5MHz bands.

The pirate selects weak DX c.w. signals and gives them the thrill of their first EU/USA contact. Edward states that this is a "Nasty thing to do and I have hundreds of QSL cards from eager EU stations seeking their first DX QSL." Edward would like it known that he does not work DX on either of these low bands.

Bosnia-Herzegovina

As I put the column together news arrived that the ITU has granted a request from the Ministry of Communications and Transport in Bosnia and Herzegovina (BiH) to replace the T9A-T9Z callsigns with E7A-E7Z.

According to IARU Secretary **David Sumner K1ZZ** "While it probably will take some time for the BiH administration to implement this change it should put to an end the use of call signs outside of the ITU allocated call sign block by stations in parts of BiH." The new prefixes will be implemented "later in the year" according to David.

Your Reports

On to your reports now and first off is **Panos Dadis SV1GRN** in Athens who used a home-brew 'inverted L' with an antenna coupler on 7MHz to work s.s.b. stations UT3IB/P (Ukraine), RV3GS (European Russia), LZ07IPY (Bulgaria), IQ0VT (Italy), JA0PI (Japan), EC7DX (Spain) between 0700 and 1600UTC.

Also on the band was **Martin Addison 2E0MCA**, East Finchley, North London who used a new Yaesu FT-2000 and 10W to a folded half-size G5RV finding F5BBD (France) 0455, PD5SS (Netherlands) 0531, HB9XC (Switzerland) 1525 as well as HB100JAM operated from Kandersteg Scout Station at 2012UTC. Martin is very pleased with his transceiver, although the manual takes a little getting used to!

Results with Martin's Heil headset have been very favourable using just a small amount of processing - though he continues to experiment with the Yaesu's settings. A manual a.t.u. is a must as the rig cannot cope with the high s.w.r. levels to be found on the G5RV.

A QRP report once again from Worcester Park in Surrey where **Eric Masters G0KRT** worked OM7JG (Slovak Republic) 0433,

YL2PQ (Latvia) 0611, S58D (Slovenia) 0606 and F6HFX (France) later at 1845UTC using a Yaesu FT-817 running 5W c.w. into a modified W3EDP antenna, which is 25.6m (84 feet) long via an SGC230 auto tuner.

The 10MHz Band

Moving up to 10MHz and **Ted Trowell G2HKU** on the Isle of Sheppy in Kent who worked the key again contacting OH0/DJ3KR (Finland), 9K2HN (Kuwait) and JH6WMJ/4 (Japan) around 200UTC using his Ten Tec Omni V at 75W to a G5RV.

The 14MHz Band

On the 14MHz band, Ted managed ZC4LI (UK Sovereign Bases on Cyprus) AS-004, YV5DTJ (Venezuela), CX5BW (Uruguay) and PS7DX (Brazil) around 2025 while P40W (Aruba) SA-036, CN2GE/M (Morocco), HC2SL (Ecuador), 7X4AN (Algeria) and 8R1J (Guyana) all made the log around 2100UTC. Ted said "There was lots of DX to be heard although band conditions were very spasmodic for most of the time."

The log of **Martyn Medcalf M3VAM**, Chelmsford, Essex lists s.s.b. stations OZ7AKT (Denmark) 1047, ER3ZW (Moldavia) 1714, LX2007L (Luxemburg) 1849, 4N1KW (Croatia) at 2003UTC using his Icom IC-746 and half-size G5RV antenna with an SGC-237 auto tuner.

Operating QRP as **F/M0XJP/P** in the French Alps was new reporter **Martin Juhe** from Knebworth, Hertfordshire. He used a Yaesu FT-817 at 5W to a mobile whip and was pleasantly surprised to log LA0AK (Norway) 0938, OE6MBG (Austria) 1012, EA6AZ (Balearic Islands) EU-004 at 1025, DJ1AA (Germany) 1050, IZ7FUL (Italy) 1115, EA7/G1OTJ (Spain) 1148, R11CA (European Russia) 1153 and S51GL (Slovenia) at 1247 as well as UK stations G7LPW/MM 1035, GM0B on the Island of Bute 1104 and GB4IPY (International Polar Year) at 1255UTC.

Martin adds "I did try to work M3OHI who was calling CQ between 1040 and 1115 and had a good 5/7 signal with me. However, he obviously could not hear my low power s.s.b. calls and eventually I lost him." Continuing his drive down to Cahors in South West France and using a home-brew dipole, Martin worked DM3ML (Germany) 1250, CT1LF (Portugal) 1442, PA3GGB (Netherlands) 1540, UR7AA (Ukraine) 1557 and RA3TP (European Russia) at 1702UTC. Not bad going for a very simple station using voice and low power.

Owen Williams G0PHT, Biggleswade, Bedfordshire used a Yaesu FT-747 and dipole to work Martin JW/G3AZY (Svalbard) EU-026 at 1221, UA1QV/1 (European Russia) in the Barents Sea on EU-160 at 1703 and IA0KM (Sovereign Military Order of Malta) EU-023 at 2010UTC using s.s.b. and 100W.



Fig. 2: Martin M0XJP's portable station.

If you worked the July operation of 1A0KM and want to check you are in the log then try www.pagus.it/1a0km

Meanwhile, Eric G0KRT found time to work s.s.b. calls 5P9W (Denmark) 1550 and IK5/5B9CDX/QRP at 1655UTC and Panos SV1GRN logged GB100J, CX5BW (Uruguay), IS0/DL9ABF/M (Sardinia) EU-024, 5H0RS (Tanzania), EP3HF (Iran), 7X2EB (Algeria), ON4AMM (Belgium), OJ0B (Market Reef) EU-053, EW8AM (Ukraine) and 9H1VC/P (Malta) EU-023 though no times were given.

The 18 & 21MHz Bands

The 18MHz band was favoured by **Elgin Mackinlay M0ELG**, Kidderminster, who used s.s.b. and a dipole cut for the band to work SV3AQP (Greece) 0715, IK5ORP (Italy) 0730, SV5/DL6NBR (Dodecanese Islands) EU-001 at 1201, OH0Z (Aland Island) EU-002 at 1758, SL8SUB/MM/P (Sweden) onboard a berthed submarine at 2045, EA9BW (Ceuta & Melilla) 2100 and WP4U (Puerto Rico) NA-099 at 2350UTC.

Also on the 18MHz band and using s.s.b., was Owen G0PHY who used 100W again to log IA0KM again at 1059 and 5N8NDP (Nigeria) at 2007UTC. On the band, Martin 2E0MCA used 10W finding HB9XBG (Switzerland) 1509, YZ7AA (Serbia) 1707 and OE8TLK (Austria) at 1942UTC.

There were just two contacts on the 21MHz band as conditions were described as very poor by most reporters. Owen G0PHY worked IA0KM once again at 1316 using s.s.b. and Eric G0KRT logged IT9BLB (Italy) at 1712UTC using c.w.

The 28MHz Band

The 28MHz band proved popular with openings throughout the day to Europe. Elgin M0ELG had voice QSOs with IZ5DRL (Italy), S53APR (Slovenia), F8NAN (France), EA3EVL (Spain), SM4EXP (Sweden) and LA4GHA/P (Norway) between 1747 and 2115UTC. Martin 2E0MCA listed EU6AF (Belarus) 1109, OM/OK1CRM (Czech Republic) 1134, LA2OKA (Norway) 1155, SP4JCO (Poland) 1213, EA3EVL (Spain) 1332 and S57S (Slovenia) at 1722UTC and Ted G2HKU worked c.w. station OY3QN (Faroe Islands) EU-018 at 1000UTC.

Signing Off

Well that's about it for another month and once again my thanks go to all our reporters

75 Years Celebrations

History of h.f. operations from 1910 to 1920

1910 - The first Callbook was issued.

1912 - The *RMS Titanic* disaster occurred with the most famous use of wireless in an emergency. Shortly after this, wireless telegraphy using spark-gap transmitters became widely used on large ships. The Radio Act of 1912 was passed, that effectively limited US private stations (or Hams) to 200m, which was practically useless. The range of equipment was barely 25 miles at that time. Almost overnight the number of Amateur stations dropped from an estimated 10,000 to around 1200.

1913 - The International Convention for the Safety of Life at Sea was convened and produced a treaty requiring shipboard radio stations to be manned 24 hours a day. **Harold Arnold** working for AT&T developed the amplifying vacuum tube that made possible the first coast-to-coast telephony and the first transatlantic radio transmissions. The same year, **Edwin Armstrong** developed the regenerative receiver and also discovers that the 'Audion' (Triode) vacuum tube could be made to oscillate.

1914 - The ARRL begins to print a small magazine called *QST*.

1915 - **Lee De Forest** began the longest lawsuit in radio history when he sued Armstrong over the basic regenerative patent. He finally lost the suit in 1921 and 1923 when it was demonstrated in court that de Forest could not explain how or why his audion tube oscillated. **Ray Kellogg** invented the electric 'moving coil' loudspeaker.

1916 - Amateur station 2PM succeeded in breaking all records by sending the first transcontinental relay message from New York to California.

for their logs. If you do send in reports please try to include a full name with your callsign and address, the equipment you used and the contacts including the callsign, band used, time and mode together with any other information you might like to add. My thanks also to **Tedd Mirgliotta KB8NW** editor of the *OPDX Bulletin* and **Mauro Pregliasco I1JQJ/KB2TJM** editor of the *425 DX Newsletter* for the DX information. Until next time, have a good DX filled month.

73, Carl GWOVSW

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Introduction

Unstinting Admiration!

Rob Mannion G3XFD looks back to the highly skilled work of the early wireless hobbyists and declares his unstinting admiration for the early constructors as he remembers his own constructional difficulties. However, unlike the pioneering constructors who had to make their own components because they often weren't available from the local radio shop – Rob's problems were due to a tight pocket money budget!

Unstinting Admiration!

In his second article on the early days of the wireless hobby – immediately following this introduction – **Charles Miller** makes reference to the skills the hobbyist required to make the necessary components. Indeed, Charles mentions the required carpentry skills and experience with the lathe. And while looking back from 2007 to the very early 1920s (and earlier) – we can only admire just how skilled and determined the early constructors were.

Nowadays, although many of the familiar local radio hobby shops have disappeared, perhaps with some of the more prominent urban corner sites (in the UK anyway) now being occupied by the ubiquitous Tesco Express shops, we still have access to readily available components and bits and pieces via *PW* advertisers and radio rallies. However, even though it's perhaps difficult for the modern new entrant into hobby radio construction to appreciate the obstacles facing their contemporaries 75 (and more) years ago – I can sympathise with them because in the 1950s I also had limited (albeit for different reasons) component and equipment availability.

Limited Budget

When I came into the hobby – around 1954 – my pocket money was rather limited and had to go a long way. Radio components were easily obtainable, as there was much wartime surplus about – but with only 2/6d (12.5p) a week (very generous in those

days) my money was gone very quickly.

I had started buying *PW* when it was 9d in the 'old' money but it soon rose to 1/3d and half of my budget was spent. My biggest problem was obtaining suitable headphones and (they were rare even in those days) a good quality pair of high impedance 2000 Ω was out of my reach so home brewing and innovative use of what was to hand – were the order of the day!

In his latest article, Charles mentions the difficulty of making your own headphones and from my own experience I know just how time consuming it was! Even with a much cherished copy of *The Boy Electrician* (from the 1920s and 1930s), which provided much information – making a really sensitive headphone was beyond me.

Although my home-brewed headphones worked – they required a much larger signal to drive them than could be provided by a simple crystal set. There wasn't a problem with valved receiver when I progressed onwards – but for the simpler sets I had to rely on wartime surplus equipment.

My most valuable bargain buy in those days was a single balanced armature headphone. It cost me my entire week's pocket money but it was well worth it! The reproduced audio quality was superb and the earpiece was very sensitive and – despite being a low resistance type – it proved to be very effective for crystal sets.

Uncomfortable Coat-hanger

Unfortunately for me, holding the single

earpiece to my ear for long periods

– especially when listening to radio drama – proved tiring and I decided to make a head band out of an old wire coat-hanger. It was successful but rather uncomfortable!

I found out just how uncomfortable the crude wire headband was after the school radio club I was involved in made use their own headphone units using (ex GPO Bakelite telephone earpieces). Without exception my radio club members considered I must have had a hard head or was very keen in those days!

The youngsters – some of whom went on to study electronics at university – were absolutely amazed when I told them that early constructors had to make literally everything because there were no wireless shops! We didn't have to attempt to make the home brewed potentiometer, **Fig. 1**, in the way described in *The Model Engineer and Electrician* (May 22nd 1913) but we did make successful galena and copper oxide detectors for our crystal sets.

Occasionally, whenever I meet former school radio club members nowadays, they like to remind me of the DIY projects they completed. Without exception they like to tell me of the wonder they felt from hearing voices from their old GPO earpieces, coming from a collection of toilet roll formers, drawing pins stuck into a breadboard and a wire dangling out of the school dormitory window. Perhaps I helped them build a foundation of interest in Science? Enjoy Charles Miller's article – it's fascinating!

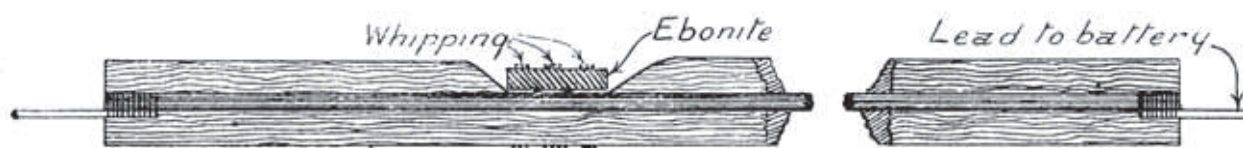


Fig. 1: Here is the detail of how to make a potentiometer as it appeared in *The Model Engineer And Electrician* dated May 22nd 1913. The accompanying description said: "The potentiometer is made out of a No. 4 Hardtmuth's lead pencil as illustrated. The pencil was first put into hot water till it came unglued, then the ends of the lead (graphite) were electroplated with copper and the leads whipped on and soldered..." You have to agree that it's much simpler now!

1910 – 1939

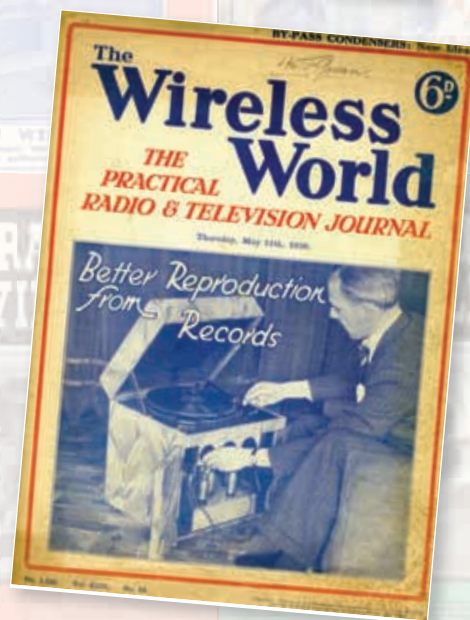
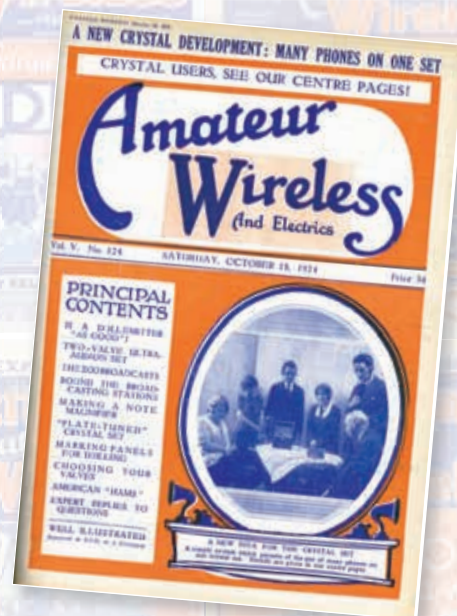
In part two of his series, **Charles Miller** continues to provide a fascinating insight into the world of hobby wireless magazines before the launch issue of *Practical Wireless*, which appeared in Spetember 1932.

Snippets from the archives of hobby wireless magazines. In these pages, from magazines in our archives of the early days of radio, you'll find pictures and layout diagrams for, what were then, state-of-the-art radios.

On page 70, there's the circuit diagram and installation of an Amateur transmitter-receiver of 1913, as described in the pages of *The Model Engineer And Electrician* magazine. Was this the first transceiver, even though it looks primitive?

Read the advertisements for test equipment that both professional and Amateur users would aspire to.

Every month during this eventful year we take a look back of historical radio reading in this special 16-page supplement



The Early Days

Hobby Wireless The Early Days

Wireless as a hobby can be traced back to the early 20th century, in fact to not long after **Marconi's** well-publicised pioneer transmissions. Early wireless enthusiasts were called experimenters by the General Post Office (GPO), which required them to take out licences to build, own and operate their own wireless telegraphy equipment (it's perhaps now difficult to believe the absolute control exercised by the GPO over the use of the airwaves).

At that time, there was no differentiation between experimenters who just wished to receive or to transmit as well – the one licence covered both. People from all walks of life were attracted to the hobby but it could not then – or for a long time afterwards – be for anyone but the fairly rich. Although from 1908,



Not hobby wireless as we know it but one that goes back to Adam and Eve!

GAMAGES OF HOLBORN. BENEFINKS OF CHEAPSIDE. Wireless Telephones and Signalling Apparatus.



Wireless Telephone Headgear.

Commercial Pattern, Ball and Socket Joints, minimum weight, wound with 50 gauge copper wire. Resistances warranted.

Total resistance 1000 ohms.	17 6
2000 "	20 "
3000 "	25 "
4000 "	30 "

DOUBLE RECEIVER, with adjustable head band.

2000 ohms	30 "
3000 "	35 "
4000 "	40 "



Wireless Loud Speaking Receiver.

Large Double-pole Receiver, fitted in Polished Hardwood Case, with terminals, and including sound director screwed into top of Receiver Case.

If this instrument be used in conjunction with a "Brown" Relay, wireless signals can be distinctly heard without the use of an Head 'Phone at a distance of 10 to 20 feet.

Price £2 5 0

Electric Wire.

For Bells, Telephone and Lighting.

No. 1. Best silk covered flexible Bell Flex.

1 1/2d. yard. 13 doz. yards.

Cheaper quality 1d. yard.

10jd. doz. yards.

Gamages store in London was offering "complete wireless outfits" by mail order for those who could afford them, most experimenters constructed their own equipment, aided by occasional articles printed in magazines such as *The Electrical Magazine*, *The Electrician*, *The English Mechanic* and *Model Engineer*.

Virtually All Home Made

It has to be borne in mind that virtually everything needed for a transmitter or receiver was – home-made – not purchased from a shop. The wavelengths in use were extremely long – thousands of metres – and required large tuning coils consisting of hundreds of turns of wire. The latter in itself was not cheap but in addition the wooden former on which it was wound on probably would have to be

In the second of his articles exploring the hobby wireless scene before *PW* was first published, Charles Miller the Editor of *The Radiophile* magazine goes back to the early days where home-brewing was the rule for most components!

turned up on a lathe. The woodwork, that it was mounted on, would be cut out from solid wood, glued and screwed together and then varnished.

The plates needed for both fixed and variable condensers would be cut from sheet brass or aluminium and built up with nuts, bolts, spacers and spindles (where needed) made on a lathe. The experimenter needed to have a workshop well equipped for both wood and metal working together with the necessary skills. There was, though, one essential item for a receiver that very few if any constructors would have wished to tackle: the 'telephones', i.e., headphones.

To be sensitive enough to reproduce the faint signals from a distant transmitter, headphones had to be of the high-resistance (high impedance) type with operating coils having windings of at least 2000 Ω and preferably up to 8000 Ω . To achieve this, many thousands of turns of wire thinner than a human hair must be laid on bobbins no larger in overall area than a postage stamp and this obviously required very special equipment.

The techniques required for headphone manufacturing was reflected in the price! A single earphone might cost up to 30 shillings (£1.50p), while a pair would be at least £2, this was at a time when these sums were more than most ordinary people earned in a week. On top of all this, the large aerial systems needed to transmit long waves and to pluck weak signals from the air demanded the amount of free space that would be available only at the homes of the well-off.



Leslie McMichael.

William Le Queux

Someone who was well equipped on all the above counts was the immensely popular 'thriller' writer **William le Queux**, who appropriately – at one time – had lived in a flat previously occupied by the great **Guglielmo Marconi** himself. William le Queux's (LQ) books enjoyed huge sales and provided him with sufficient income for him to buy a large property on the Hog's Back in Surrey, south west of Guildford in Southern England and to engage seriously in wireless telegraphy research.

By 1911, LQ's level of competence was such that the British Admiralty gave him permission to set up a wireless station on high ground between Cromer and Sheringham in Norfolk in East Anglia, from which he communicated regularly with the Cross Sands lightship far out in the North Sea. What happened to his equipment on the outbreak of war is veiled in secrecy but it would not be fanciful that he continued to carry out work of national importance for Their Lordships (the term used to describe the Admiralty). Certainly LQ was treated completely differently from other experimenters after the war, because he was back on the air only a year later at the Hog's Back.

The transmitter (callsign 2AZ) used by LQ was built with the active help of Marconi Wireless Telegraph Company (MWT) and put out speech and music, which was received in many part of the UK and also abroad. Without doubt, LQ was one of the earliest



Woman radio operators at work in a Royal Navy Establishment.

of 'broadcasters' and his efforts must have spurred on many hobbyists to build receivers.

Credit To Gamages

Mention of Gamages Store has already been made and this firm deserves the credit for devising a scheme for listing experimenters in order that technical information and innovations might be shared amongst them. It says a lot for the enthusiasm of those early experimenters that they were willing to spend their time, effort and money in order to be able to tap out messages laboriously via spark transmitters and to pick up the scratchy signals from other experimenters. Apart from these the only sounds to be heard 'on the aether' were communications to and from ships.

It was a situation that is completely unimaginable today when the entire radio spectrum is chock full of signals of one type or another. The situation was summed up by **Leslie McMichael** (LM-M), later to be a leading manufacturer of radio sets, who was one of the founders of the **Wireless Society of London** and later of the **Radio Society of Great Britain** in a piece written in 1933, "The pre-[first world]war wireless amateurs were an intrepid band of pioneers who made up in zeal what they lacked in numbers. The apparatus was large and cumbersome and worked only after the acquirement of infinite skill and patience. Remember that the signals available were only of the Morse variety but the 'aether explorers' maintained their enthusiasm... Cast your mind back to those very early days of wireless when the sight of an aerial in your back garden made your neighbours think you were heading for the first stages of imbecility.

"Then there was the burning of the midnight oil by the intrepid band of transmitters who tapped Morse keys far into the night in their memorable efforts to annihilate space by wireless signals...to these, my old friends, I say - did you find an officialdom sympathetic towards your burning of the midnight oil? No! For after giving you a wavelength allocation measured in thousands of metres necessitating the winding of coils consuming thousands of yards of wire, the only thanks you received was the curt information that you were interfering with official wireless services. That meant that you must be relegated to the other end of the wavelength scale, the short waves, everyone thinking that the difficulties of establishing communication on a few metres would be insuperable. But what happened? Why you just rolled up your sleeves and redoubled your efforts to find the solution to the mysteries of wireless..."

The extract I have just quoted is a fascinating slice from Amateur Radio history and the statement was true, of course. It's impossible to overstate the part played by Amateurs in the development of radio and considering their small numbers - Leslie McMichael quoted an estimate of no more than one thousand before the start of broadcasting in this country and he should have

Legalities in the early days.

Bingley, cutting Lathe.—Golden Road, Anerley.
Sale of exchange.—6 h.p. Stationary Petrol engine can be seen running, a bargain, £10; Workingman's Bicycle, £3. Wanted, 31 Tail-Hillingdon, Uxbridge

WIRELESS APPARATUS.
We are asked by H.M. Postmaster-General to state that Wireless Apparatus may only be sold to persons who can produce a Post Office Permit for the purchase or use of such apparatus.

Gas Engine (Crossley), about 2—3 h.p., splendid condition, incomplete, best offer over £11 secures. —97, Elswick Road, Lewisham.
Lathes Faceplates, 6" dia., machined, slotted, screw-cut exact requirements, 45. 6d.—STANTON, "Dynamo," Wednesbury.
Dynamo, 25 volts 10 amps., ball bearing, quite new, £11. Below.
Accumulator, 45 amps. actual, in wood case, outside terminals, £11. Below.

Bike Saddle, 7s. 2 Stewart Speedo first cheque secured.
24 Imported Six High-tension Magnets, 10s. 6d.; C.A.V. Magnets, 10s. 6d.; D.U. 2, anti-4, 10s. 6d.; Stocks and Dies, with taps; Case, 10s. 6d.; and Dies, with case, 10s. 6d.; Master Vibra Coils, with case, 10s. 6d.; Set of Accumulator and charged, 10s. 6d.; 10 to 30, £1 5s. 6d.; £1 5s.; large as new, £1. —Pond Grove Park, W.E.
Tool Bargains.—Taper Taps, 10s. 6d.; Sets from 10s. 6d.; Breast Drill, 2 sp. Engineer's Wood lists.—M. F.L.A. Islington, London.
Gauge 1.—Gre Passenger Coach,

The ESI-FIX AERIAL
Absolutely Weatherproof

CUT OUT TROUBLE
by positively preventing aerial leakage:
Weak signals, reduced range, irregular and indistinct reception can all be traced to an inefficient aerial.
The "ESI-FIX" aerial has a patented condenser insulation over the entire length of aerial and lead-in.

IT CANNOT POSSIBLY LEAK
Rain, fog, snow, hail or dirt cannot possibly get at it. Absolutely weatherproof and impervious to wet, rust, corrosion or mechanical damage.
The "ESI-FIX" aerial comprises aerial wire and insulation, together with sliding, adjustable shackles, terminal and clip, thrown up anywhere, anywhere, without any previous installation.

FAR EASIER TO FIX than any other aerial. Can be applied anywhere, anywhere, without any previous installation.

MAXIMUM EFFICIENCY GUARANTEED. Conductor is composed of 30 strands, 30 S.W.G. hard-drawn copper wire. No joints, no soldering. Exceptionally low high frequency resistance.

"FIX IT LIKE A CLOTHES LINE"
For twin or multiple wire aerials use two or more short lengths. The "ESI-FIX" EARTHING SET, comprising patented pipe grip, and 30 ft. of "ESI-FIX" cable. Price Carriage paid in U.K.

CHAMBERS & ELLIS, 6-7, Craven House, Kingsway, LONDON, W.C.2
SOLE PATENTED AND MANUFACTURERS:

Name _____
Address _____
I have difficulty in obtaining "ESI-FIX" Specialised at my local wireless dealer's. Please, therefore, supply me direct with _____
ESI-FIX Aerials, length 50 ft., at 12/6 each.
ESI-FIX Aerials, length 75 ft., at 12/6 each.
ESI-FIX Aerials, length 100 ft., at 15/- each.
ESI-FIX Earthing Sets, at 10/- each.
I enclose _____ value _____ in payment of the above.
To Messrs. CHAMBERS & ELLIS, Craven House, Kingsway, London W.C.2

SEND THE COUPON TO-DAY

THE "UBIQUE" CRYSTAL RECEIVER
NO BATTERIES REQUIRED
Receives SPEECH and MUSIC

A SPECIAL DESIGNED SET for Broadcasting, for superior to many of the complicated sets being offered at high prices. Enclosed End Supports and Base. Will give excellent results with a P.M.G. Aerial.

PRICE 15/- EACH POSTAGE PER RETURN
British made Benzie Headphones, Adjustable R.C. coils, complete with Carbons, 4.000 ohms, 30/-; postage 6d.

THE ESSEX WIRELESS CO., 499, GROVE GREEN RD., LEYTONSTONE, E.11.
(1 min. from Station, G.E.R.)
Telephone—WANSTEAD 749.

LOOK! LOOK! LOOK!
WIRELESS HEADPHONES
We lead every time **25/-** PER PAIR
POSTAGE 1/-

High Resistance 4,000 ohms total double Headphones with adjustable double head Bands. Beautifully finished. Brand new. Specially made for the reception of wireless broadcasting, and complete with flexible cords.

Money returned if not completely satisfied. DELIVERY BY RETURN FROM STOCK.
Compare our Price. Inspect our unolicited Testimonials. Satisfaction guaranteed.
H. STANLEY PRINCE & CO.

How the cost of being a radio listener built up, even if you aimed at the cheapest of crystal sets. Added up, the prices of the set plus headphones, aerial and earth came to £3.5s.0d., more than a great deal of working people were earning in a week. No wonder home construction became so popular.

known – the debt owed by the many to these few pioneers is immense.

Incidentally, it's conventional for writers on the subject of wireless to suggest that its well-publicised part in the capture of **Doctor Crippen** and **Ethel le Neve** and the summoning of assistance to the stricken White Star liner *RMS Titanic*, increased the number of hobbyists but frankly this has been overplayed.

Everything for Radio Reception

VARIABLE CONDENSERS

COMPLETE WITH SQUARE EBONITE TOP AND BEVELLED ENGRAVED DIAL

No. 1	...	...	...	001 M.F. Capacity	...	...	27/- each
No. 2	...	...	...	0002 M.F. Capacity	...	...	18/- each
No. 3	...	...	...	0001 M.F. Capacity	...	...	9/- each

Sets of Parts for Above, all Machining Done:
 No. 1 ... 19/- No. 2 ... 14/- No. 3 ... 7/-

Send 1d. stamp for List of Valve and Crystal Sets and all Sundries.

MANUFACTURERS OF HIGH GRADE RADIO APPARATUS.

KERR & THOMAS,

BARR HILL WORKS, DALBEATTIE, SCOT.

of operators, many of them drawn from the ranks of pre-war experimenters.

When the war ended and they were demobilised there were tens of thousands of men – and women. Hundreds of them had volunteered for military service in the early part of the war and their expertise was of great value, particularly in training the ever-growing number of men and women, needed to operate radio communications equipment.

By the end of the war although the actual total of registered experimenters hadn't increased – in fact it might well have dropped – there were thousands of potential wireless enthusiasts who had the knowledge to build, operate and maintain radio equipment and they were keen to exercise their skills. Practical and reliable radio telephony had been developed, and telephony meant that no longer were the airwaves restricted to only Morse code communications. The broadcasting of speech and music was possible and this was already being demonstrated commercially in America and on the Continent.

So, what did the Government do to show its appreciation of the part played by experimenters in winning the war? The answer is – that it refused to let them take up their hobby

where they had left off and continued to impose the blanket ban. As a result in 1919, it remained illegal for anyone to build radio equipment or even to buy or own a valve!

It was nonsense, of course, but to get the blanket ban overturned required legal action to be taken by the wireless societies. Their numbers grew rapidly from 1920 when 16 were affiliated to the Wireless Society of London; in 12 months the figure rose to 50 and by 1922 there were 75 affiliated to the WSL. This does not include the many other active societies that had not as yet sought affiliation, nor those who had joined another organisation known as the Radio Association.

It was in the nature of things that many members of the societies were in positions of power or influence, which aided the fight against bureaucracy. Unfortunately, in an article of this nature, it would take up far too much space to record the comprehensive details of the action but – as is often the case with litigation – the process was slow and to complicate matters it became bound up with the cause of establishing regular broadcasting in Britain (for anyone wishing to read the full story the pages of *Wireless World* and *Radio Review* 1919 – 1924 provide an invaluable source*).

**Another, absolutely fascinating reference source, is the book BBC Engineering History 1922-1972 by E. Pawley. This book*

"NO CRYSTAL SET IS COMPLETE WITHOUT THIS WONDERFUL ATTACHMENT"

Extract from an entirely unsolicited testimonial recently received from a customer situated 83 miles from Doncaster

The WONDERFUL ATTACHMENT referred to is the

MAGNETIC MICROPHONE BAR AMPLIFIER

NOT a Microphone Buffer.

NO Valves, Accumulators or H.T. Batteries, Fragile parts, Distortion.

Simple as A.B.C.

MICROPHONE AND OTHER PARTS OF AMPLIFIER SUPPLIED SEPARATELY FULLY ILLUSTRATED LISTS FREE



Not only will this marvellous device give really good LOUD. SPEAKER RESULTS from CRYSTAL RECEPTION of average strength, but it is absolutely the ONLY means of increasing the strength of weak signals in headphones without using valves.

Works perfectly on one or two dry cells.

A BOON TO DEAF PERSONS

EQUALLY EFFICIENT ON VALVE SETS

NEW WILSON ELECTRICAL MANUFACTURING CO., LTD., 18, F1 LONG

These events certainly heightened public awareness of radio, although the WSL had been formed before those events occurred.

In any case, only 14 months after the *Titanic* tragedy came the outbreak of The First World War (August 1914) and with it, radio as a hobby came to a complete halt, by which time half a dozen other wireless societies had been formed. The experimenter licences were suspended and not only was transmission or reception of wireless messages banned but the discussion in magazines of technical details of equipment was also proscribed. This was an all too typical example of the Establishment reaction to anything that it didn't quite understand but feared might be of use to an enemy.

Ineffective Blanket Bans

The fact that blanket bans usually inconvenience only law-abiding citizens without deterring lawbreakers in any way and as a result were ineffective, seems never to have been grasped by politicians down the ages. Presumably, they believed in 1914 that enemy agents might use wireless to send valuable information to their masters in Germany and that on learning of the ban would say, "Oh, dear, I must stop doing this", to meekly hand over their equipment to the GPO (I imagine the politicians were disappointed in the number of agents handing over equipment!).

However, despite the war, radio experimenters still had a part to play. The Army, the Royal Navy, the Royal Navy Air Service and the Royal Flying Corps all used radio for communications. Official schools were set up to train the necessary large numbers

COMPLETE SET OF PARTS TO BUILD

Combined Crystal and Valve Receiver

4 in. by 3 in. Prepared Cardboard Former ... 6d.
 1 lb. No. 30 D.C.C. Copper Wire ... 8d.
 200. No. 25 S.C.C. Copper Wire ... 8d.
 2 in. of 1/4 in. Brass Rod fitted with Ebonite Handles ... 9d.
 Velvet great Laminated Switch Arm ... 2s.
 7 Studs each fitted with a Nut ... 10d.

The Most Suitable Valve Panel to use with above.



COMPLETE SET PARTS

15/9

Post 9d.

Contains Velvet Filament Rheostat ready made, Spring Tantalum Grid Lead, 2 Mica Grid Leak Condensers, Insulating Sliding, Wire and all Terminal 1/2 inch pilot. Polished Mahogany Cabinet to fit (extra) 2s.

BUILD YOUR OWN CONDENSER.

Set of Parts Complete.

1000	2000	5000	10000
21/-	14/-	11/-	8/-

Supplied with Knob Pointer and Scale for Panel Mounting. If required for Box Mounting Send 1/- extra.

Send 6d. for our ENLARGED ILLUSTRATED CATALOGUE "A" with list of stations. Crammed full of the latest and best.

PETO SCOTT, The Condenser King.

FEATHERSTONE HOUSE, 64, HIGH HOLBORN, LONDON, W.C.1.

– although mostly rather obliquely – also pays tribute to experimenters and Amateurs and early technology. Although long out of print, examples are to be found on the Internet at around £20. **Editor.**

Divided Into Two Groups

Unfortunately, it's a simplification – but a necessary one – to state that the year 1922 marked the division of radio enthusiasts into two groups: the experimenters who both transmitted and received, generally called Radio Amateurs and the people we'll call hobbyists who constructed only broadcast receiving sets.

The hobbyists soon outnumbered transmitting Amateurs by at least a 100 to one and by the middle of the 1920s the figure was closer to a 1000 to one – so naturally the early wireless magazines catered for them almost exclusively. We also have to acknowledge the emergence of a third group consisting of people who wished only to listen to broadcasting and whose technical knowledge was limited or non-existent.

To cater for the hobbyists numerous manufacturers, most of them small and ephemeral, offered a wide range of ready-made radio sets. While on this topic, and interestingly, I've read the following text – "Radio receivers through most of the 1920s were just crystal sets" – twice in the last 12 months, most recently in a book by a woman who is supposed to be social historian. And, because the wording in the two separate books I've read has been so similar, I'm inclined to believe that this is a piece of "received information", just downloaded from the Internet. It's worth reminding readers that I have warned elsewhere about not believing 'sweeping statements' that haven't been checked out thoroughly and this particular canard is a prime example – and it's likely to take root if it's authenticity is not thoroughly researched.

Of course, **there were** a lot of crystal sets in use because they were, in modern advertising terms, 'entry

TWELVE DON'TS FOR LISTENERS

DON'T run your aerial parallel to other aerials near by.
 DON'T connect your earth to the same point as that used by your neighbour.
 DON'T try and communicate with your neighbours by making your receiver howl.
 DON'T use a longer aerial than necessary if you have strength to spare.
 DON'T vary your strength of reception by distorting your receiver. It spoils the quality and is liable to increase interference in your own set.
 DON'T try to work a loud speaker from a plain single-valve set.
 DON'T "fiddle" with your set if the results are satisfactory.

DON'T forget that it is impossible practically to get true reproduction when receiving in the "short point".
 DON'T forget that the B.B.C. is prepared to send a copy of a special oscillation pamphlet to anyone, free of charge.
 DON'T forget that when you oscillate you are running the risk of having your house cancelled by the Postmaster-General.
 DON'T use a super-heterodyne receiver on an ordinary aerial. A frame aerial is essential.
 DON'T compensate for the running down of your batteries (both low and high tension) by increasing reaction. If you do this your set may oscillate when switched on after standing idle for a few hours.



THERE ARE SOME "ODD" EXPLANATIONS FOR OSCILLATING
 (Drawn by H. M. Batesman for the B.B.C. Anti-oscillation Pamphlet)

Early listeners were on a steep learning curve!

level' but they were in a small minority of the range of receivers on offer in the early 1920s, which extended from single-valve sets at around £10 to multi-valve types at anything from £14 to £40.

When related to average wages at the time – even someone in a very good office job was unlikely to be paid more than £3-10s (£3.50p) a week – these prices were huge. Additionally, the small print had to be read very carefully because quite often they did not include valves, batteries or the royalties which had to be paid to MWT or for a time to the BBC.

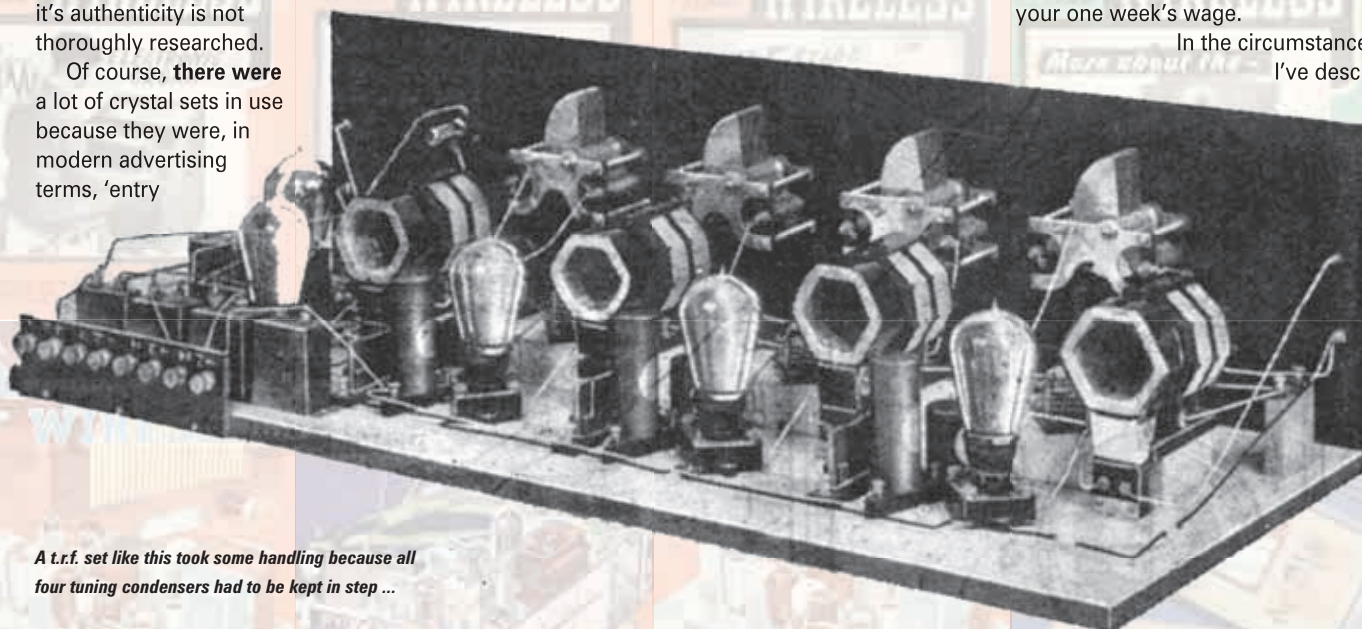
Then an aerial and earth system was necessary, so the final bill could come to nearly half as much again before any programmes were heard! Even with the humble crystal sets – popular because no batteries were required to power them and the running costs were zero – there still wouldn't have been many ordinary working folk who could have purchased a wireless set without saving up for weeks.

Imagine It's 1922!

Imagine that it's 1922, you're a young man with enthusiasm and you want to get involved in this 'listening-in' business so you look through wireless catalogues for a receiver that would be within your means. A very cheap crystal set, the Ubique is on offer from the Essex Wireless Co. 15 shillings (75p), which isn't too bad but you'll need headphones as well and these will set you back another 25 shillings (£1.25p).

Then, of course, you'll have to have an aerial and an earth which Chambers & Ellis will supply. The aerial will have to be a good one if you're going to get decent reception on a crystal set – so you had better plump for the one hundred foot model at 15 shillings. The earth system will cost you another 10 shillings, so the total cost will be (before you've even considered the ten shilling licence required) very nearly equivalent to your one week's wage.

In the circumstances as I've described



A t.r.f. set like this took some handling because all four tuning condensers had to be kept in step ...

... but a nine-valve superhet like this one had only two tuning controls. Three more minor control and three switches needed only occasional adjustment. The cabinet was over four feet long!



it's no wonder that the wireless magazines flourished by showing how sets could be built at home at a fraction of the cost. Wire with which to wind tuning coils might be obtained for nothing from a scrap electric motor; a kit of parts for a tuning condenser could be had for only 3s 6d (35p) and as for the crystal detector, you could buy one for 5s 6d (27.5p).

There's still the final decision regarding headphones to be considered, although these could cost 25s (£1-25p) as mentioned earlier, if you were prepared to put up with just a single earpiece you could cut the cost to 15s, while a $0.001\mu\text{Fd}$ shunt condenser would cost three shillings (15p). You could then string up some of the free wire as a rudimentary aerial and use the water pipe in the kitchen as an earth. Above all, you had the supreme pleasure of having built something that actually worked and gave pleasure!

If, after the initial euphoria of being able to hear anything at all had worn off and passing the earphones around to other family members had become tedious (and the trick of putting them in a sugar bowl to amplify the sound hadn't been effective) the possibility existed of upgrading a receiver to operate a loudspeaker.

A simple way of doing this was to employ S.G. Brown's mechanical amplifier, which consisted of, in essence, an earphone mechanically coupled to a sensitive microphone, which in turn was electrically coupled to a loudspeaker. Only one small battery was required to power the device and it was surprisingly effective but against it was a price tag of £6.

Fortunately, it wasn't beyond the capabilities of many radio hobbyists to knock one up for themselves out of second-hand bits and pieces. For this was the beauty of starting at entry level and – if you were content to stay at it for a year or two – progress was so swift in the early 1920s that wealthier folk who had started with what were expensive state-of-the-art manufactured receivers quite soon relegated them in favour of something even better. So, a steady stream of second-hand 'spares or repair' sets became available to the less well-off hobbyists.

Government Surplus

Another prolific source of radio items for hobbyists were the sales of ex-Government surplus equipment. As usually happens when Government departments are spending taxpayers' money a great deal of over-ordering had been perpetrated and eventually

large stocks of all sorts of radio gear had to be disposed of. There were, for instance, some exceedingly fine tuner units and amplifiers used in aircraft and compact transmitters and receivers for use by the Army in the field, commonly known as 'trench sets'. There were also items of test gear such as wavemeters.

All the surplus items were extremely well constructed and the standard of workmanship involved has to be seen to be appreciated. Incidentally, although I think that the vast majority of this surplus equipment was broken up for parts, we actually had a virtually 'as new' First World War trench set entered in a *Radiophile* auction about three years ago.

The trench set vendor was the Vicar of a parish in Wiltshire who had appealed in the church magazine for items to be sold to aid the spire restoration fund. From somewhere or other had come this trench set, still in its original packing crate bearing a label from when it had been sent by the Great Eastern Railway to an address in Suffolk. It was one of those instances when I thought, if only an inanimate object could speak and tell of its adventures over the previous nearly 90 years!

Magazine Circuits

With the aid of circuits printed in the wireless magazines anyone of reasonable competence could build from parts, a two-valve note magnifier, which when coupled to the old original crystal set would drive a loudspeaker at adequate volume for an average living room. The loudspeaker itself might have to be bought new (but by 1925 the average price had dropped from about £5 to 25 shillings); or you could, of course, make one up by fastening a standard earpiece to an old gramophone horn.

However, the selectivity of the average crystal set was pretty poor so another upgrade suggested by the magazines was to do away with it and to replace it with a valved detector, perhaps preceded by a high frequency (h.f.) amplifier. Another possibility was to use a 'reflex' circuit, whereby a single valve could be made to act as both an h.f. and low frequency (l.f.) amplifier, amplifying both radio frequency (r.f.) and audio frequency (a.f.) signals. Each radio magazine had its stable of designers and over the years each and every possible combination of valves and tuned circuits must have been featured.

A little More Performance!

Looking back, it's astonishing how hobbyists were prepared to keep on altering their home-made sets in order to gain just a little more performance. They soon forgot the design being used – boosted only months ago as the wonder of the age – and it was soon regarded as 'old hat'.

Something commonly employed to obtain improved

performance from simple receivers was reaction (regeneration in the USA). This consisted of taking radio frequency (r.f.) existing at the anode of a triode detector and feeding it back into the grid circuit, usually by means of a reaction coil placed in juxtaposition to the the grid coil. In simple terms, the effect of this was effectively to lower the 'damping' effect on the latter, while providing a great deal of gain, improving its efficiency and sensitivity.

To control the amount of reaction, either the spacing between the coils was made variable or the amount of energy passing through the reaction coil was adjusted by the use of a variable condenser. The more reaction applied the greater was the sensitivity of the detector but once a certain point was passed it began to oscillate and to impose howls and whistles on the speech or music being reproduced by the headphones or loudspeaker.

The oscillating detector also acted as a very effective low-power transmitter on the same frequency as reception, broadcasting the said howls and whistles around the immediate neighbourhood and spoiling reception for other listeners. The old British Broadcasting Company carried out a campaign against oscillation over the air but there would always be offenders who cared only about getting the most out of simple receivers.

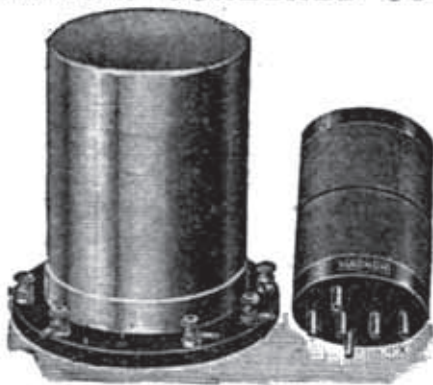
An even more potent type of reaction was developed by the American radio pioneer **Major Edwin H Armstrong**. Known as super-regeneration it involved supplying a large amount of reaction to the detector to obtain enormous sensitivity then 'quenching' the inevitable howls and whistles so that they did not spoil reception for the listeners.

It was claimed that a one-valve Armstrong super-regenerative set would drive a loudspeaker at full strength and the system was soon being copied by other radio designers. However, super-regen. sets were notoriously difficult to handle and very quickly fell out of favour. Hobbyists turned to another American invention which promised greater sensitivity with stability.

Hitherto it had been impossible to obtain really effective h.f. amplification with triodes because their internal inter-electrode capacities caused them to be unstable at above about 50kc/s (nowadays 50kHz). A **Doctor Hazletine** invented a means of stabilising triodes by deliberately introducing external capacities to 'neutralise' those within the valve and the magazines wasted no time in telling their readers about this system.

Doctor Hazletine had, however, patented 'neutralisation' and placed advertisements in the magazines to warn people not to use it without paying due tribute to him. Unfortunately, it probably cost him far more in advertising than he ever got back in royalties! Even with neutralising, though, the best amplification factor that could be expected of a triode at h.f. was below ten, so for listeners who wanted highly sensitive and selective receivers the magazines printed circuits of set with anything up to five h.f. stages, each with its own separate tuning condenser. The manual dexterity required

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Price per set of 3 Screens and Coils, 250/550, for the Elstree Solodyne £3 11 0

Set of Screens and Bases I.F. Transformers, Filter and Oscillator for the 8-Valve Super-Het. described in October issue £8 10 0

NOTE.—Where a complete set of Components, together with a drilled panel, is purchased, Royalties at the rate of 12s. 6d. per valve holder are payable.

BURNE-JONES & Co., Ltd.,
 Manufacturing Radio Engineers,
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 Cables: "Burjomag, London."

Even in the early days some constructors preferred 'ready wound' inductors!

to keep them all in step must have considerable!

Enter The Superhet

We have been talking so far only about tuned radio frequency (t.r.f.) receivers in which all the tuning and amplification of the incoming signals and the eventual detection takes place at the frequencies on which they are received. However, it's now time for Major Armstrong to re-enter the fray with something he had been working on since 1917, the supersonic heterodyne receiver or 'superhet' to the rest of us. He'd had to contend with 'experts' who "proved" mathematically that the superhet couldn't work but had carried on regardless and presented the world with a type of receiver, which is still in almost universal use 90 years on.

The principle of the superhet is based on the phenomenon that if an incoming radio signal at one frequency is 'mixed' with another at a different frequency (this is the heterodyne bit) a third frequency can then be selected. If the two original signals are separated by more than about 20kHz the third product signal is inaudible to the human ear (the supersonic bit). In an actual receiver the second frequency is generated by a 'local oscillator', the tuning of which is kept in step with that of the incoming radio signal so that the third frequency remains constant at all times. Called the intermediate

frequency (i.f.) it can easily be amplified by a number of valve stages because the h.f. transformers employed to couple them are fixed-tuned and no adjustment is required by the listener.

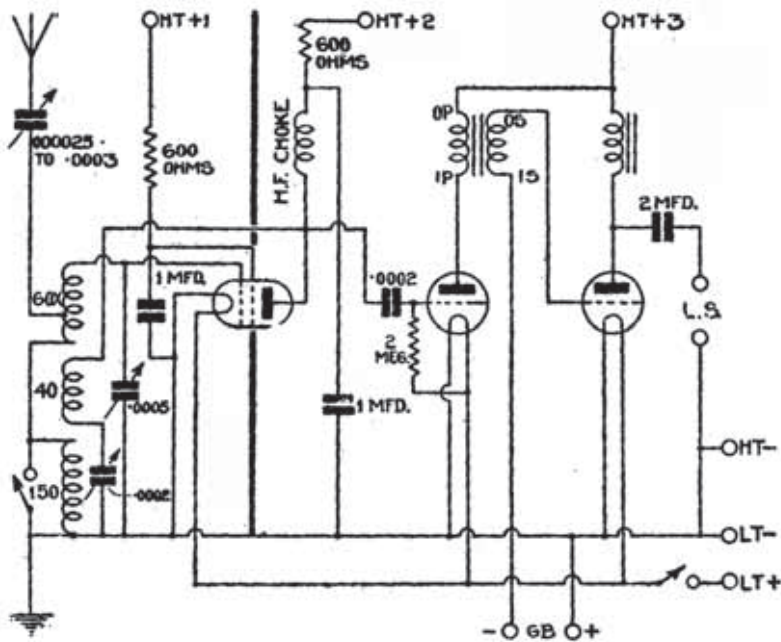
In the early superhets the i.f. was arranged to be low to suit triodes, typically being around 50kHz but it otherwise it was chosen to be well clear of any frequency used by radio transmitters. Each transformer having two tuned circuits, several i.f. stages provided not only amplification but selectivity as well, yet there were only two manual tuning condensers to be adjusted.

Commercial superhets were marketed by various firms including the General Electric Company (GEC). This firm's example cost 50 guineas – half the price of a Morris Oxford car – and it's doubtful if very many were sold. Adventurous and well-off hobbyists built superhets from kits of parts produced by, amongst others, Burne-Jones & Co. Ltd., which offered "everything needed" for an eight-valve set at £25–16s.

However, if the prospective builder read the small print carefully they would find that he had to fork out a Marconi royalty of 12s and 6d. for each valve holder, amounting to an extra £5. But for those who could afford to build a superhet the selectivity and sensitivity came as a revelation, although in its then form it was destined to have only a short period of popularity.

The drop in popularity of the superhet wasn't altogether to

The Five-point Three[★]



The circuit of the "Five-Point Three", designed in the late 1920s. With only three valves and a handful of componens it would have out-performed any five-valve set built four years before and its running costs would be less than half. This was made possible by the introduction of the screen grid valve used as an h.f. amplifier. It is drawn sideways because the early S.G.s were conventionally mounted horizontally with the envelope passing through a metal screen, represented here by the thick black line above and below the second grid of the valve.

do with the cost of building and running one, though even these were significant expenses when there were eight or more valves to be purchased and to supplied with low and high tension (l.t. and h.t.) current. The drop in popularity was actually due – to a large extent – to the introduction of screen grid valves. These really transformed home construction in the latter part of the 1920s because they provided amplification factors measured in hundreds and were completely stable.

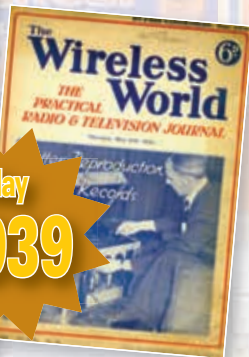
The magazines were on top of the job straight away, with designs in which a single screened grid valve h.f. stage in conjunction with more efficient tuning coils provided amazingly high sensitivity with enhanced selectivity. If these were combined with a push-pull output stage (then just starting to attract attention) and one of the new balanced-armature loudspeakers the results were truly astonishing.

If the hobbyist went one step further and made up a pick-up from an old carbon microphone or earphone he could hear his

gramophone records through the loudspeaker as well. In fact, with the aid of the magazines there was virtually nothing that the hobbyists could not achieve in the radio field. It must have been a very exciting time for them. I can confirm this because I was lucky enough to be able to emulate them. As a schoolboy I acquired large numbers of ancient magazines from my father's shop and numerous equally ancient radio sets from the local auction house.

With the magazines and radios I went right though the gamut of set-building as it had been practised up to 30 years earlier, progressing as described above from crystal sets to multi-valve receivers at very little cost to myself but learning a lot on the way. I've no doubt that many of the older readers of this present magazine could tell similar stories and if so I would be very pleased to hear from them.

News, Views and Memories from the Early Days



May
1939

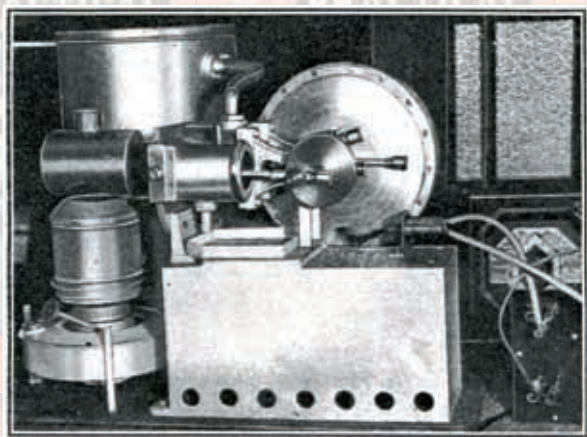
The Wireless World May 11th, 1939

Hot Air Generators Power Supply for Battery Sets

A recent German development is the introduction of three types of hot-air generators, which provide sufficient power for operating battery receivers using two-volt valves. These generators can run off a simple petrol or methylated spirit lamp using one litre of petrol for a period of ten hours' continuous working or one litre of methylated spirits for nine hours' working. A burner for charcoal or peat is also obtainable, so that the generator could be used where petrol or methylated spirit is unobtainable.

The smallest model provides just sufficient current for a Philips 338B battery superhet or similar receiver and is priced at approximately £17, although under German export arrangements the price would be considerably less. The medium sized model supplies six watts, whilst the largest, priced at ReichsMark 360 (approx £30) gives 12 watts, which is sufficient for charging a six volt accumulator such as that required to operate a receiver using a vibratory converter.

In the case of the two smaller models, two-volt accumulators are required for the filament supply of the receiver and they are connected for trickle charging by the generator.



The Wireless World May 11th, 1939

Twenty-fifth Anniversary

The American Radio Relay League is celebrating its 25th anniversary this month. The League was formed in 1914, when communication by radio was carried on by means of roaring spark transmitters, which had a distance range by direct sound almost as great as the radio oscillations produced. Hiram Percy Maxim and Clarence D Tuska inaugurated the movement as a means of keeping all Amateurs in touch with one another and by relaying communications from station to station to overcome the handicap of short range. From 237 members in September, 1914, the League has progressed to its present position, when it represents 51,000 Amateurs in the United States and possessions.

Amateur Wireless April 5th, 1924

Broadcasting for Schools

Permission has been given by the Education Committee of London County Council for the reception during school hours of six educational talks, which are to be broadcast from 2LO during April and May.

The first talk is to be given on April 4th, (Friday) at 3pm, when Dr Sir Henry Walford will speak on topics connected with music. The second will be on April 11th, when a lecture on natural history subjects is to be given by Mr E Kay Robinson. On May 2nd, Sir J Forbes-Robertson will speak on 'Shakespeare'. The Climbing of Mount Everest by Sir Francis Younghusband, constitutes the fourth lecture. Two other talks on science and history will follow on successive Fridays by authorities on these subjects.

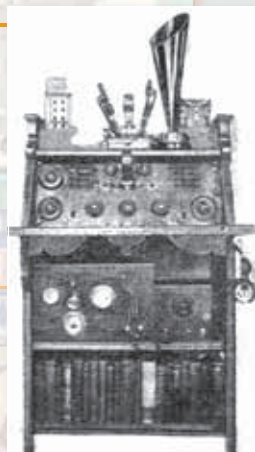
Schools including elementary, secondary and private are showing great interest in these lectures and many sets have been constructed especially to receive the first talk broadcast. The experiments are being closely watched by the Board of Education and it is likely that inspectors will attend at many of the schools to watch the effect of broadcast instructions.



April
1924

Amateur Wireless March 29th, 1924

A neat Cabinet Four-Valve Receiver, designed and constructed by Mr Talling of Chalk Farm, London. The valves are inside the cabinet.



A selection of what was happening in the Amateur Radio hobby news – reprinted from the magazines that were around before and at the same time as the birth of *Practical Wireless* – how much do you remember?

Miniature Phones



Although they are primarily intended for deaf persons, the miniature phones shown by the photograph can quite well be used by listeners with normal hearing. They should be of particular value in portable sets, their small size can be judged by comparison with the penny shown between them. Made by the the Deaf Appliance Co. Ltd., of 58 and 60, Wigmore Street, W1 these phones are sold at 25s a pair. By means of a lock nut, provision is made for adjusting the diaphragms (made of mica with pieces of metal attached) to the most sensitive position,

Oct
1924



Feb
1924

Amateur Wireless February 16th, 1924

2NM – A Brief account of **Mr Gerald Marcuse's** Station at Caterham Surrey
The two photographs reproduced here show the complete transmitting and receiving station of Mr Gerald Marcuse (2NM) of Caterham, Surrey. In the centre of the second photograph will be noticed a Marconi 55D receiver, which was used in the 1,000 metre days, its optimum being 1,600 metres. This, Mr Marcuse states, now comes in very useful for the Continental stations.

On the extreme right can be seen a universal receiver, with which any combination of valves can be used, from simple detector to Armstrong's super-heterodyne. This instrument, with the exception of the case, is entirely Amateur made. Behind the Marconi amplifier is the heterodyne wavemeter. Over the mantel-shelf there is a charging board fed from a 30-volt 12-ampere generator.

The first photograph shows the aerial system and the generator house. In the order that the generators may be run at any time of the day or night without being heard in the house they are accommodated in the small shed.

Several types of aerial have been tried but the flat-top four-wire type has been found to give the greatest efficiency. A 12-wire counterpoise, which is 50ft long, 30ft wide and 10ft high and spreads fanwise directly under the aerial, is used in place of the ordinary earth. It is interesting to note that with aerial and earthing system, wavelengths from 70 to 200 metres can be obtained with ease.

As it is generally known, Mr Marcuse met with a considerable amount of success in the recent Transatlantic tests. The circuit used was a slightly modified Meissner. The Mullard 0/250 valve was fed from a 200W

d.c. generator, which gives 100 milliamperes at 2,000 volts. A maximum radiation of 5 amperes in the aerial was obtained. The transmitter can be seen in the extreme left of the second photograph.

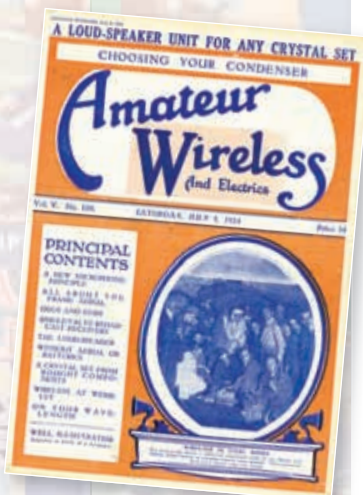


The 2NM Aerial and Generator House.

2NM – the Well-equipped station of Mr G Marcuse.



Amateur Wireless July 5th, 1924



July
1924

May
1913

An Amateur Radio station as shown in The Model Engineer and Electrician magazine, May 1913.

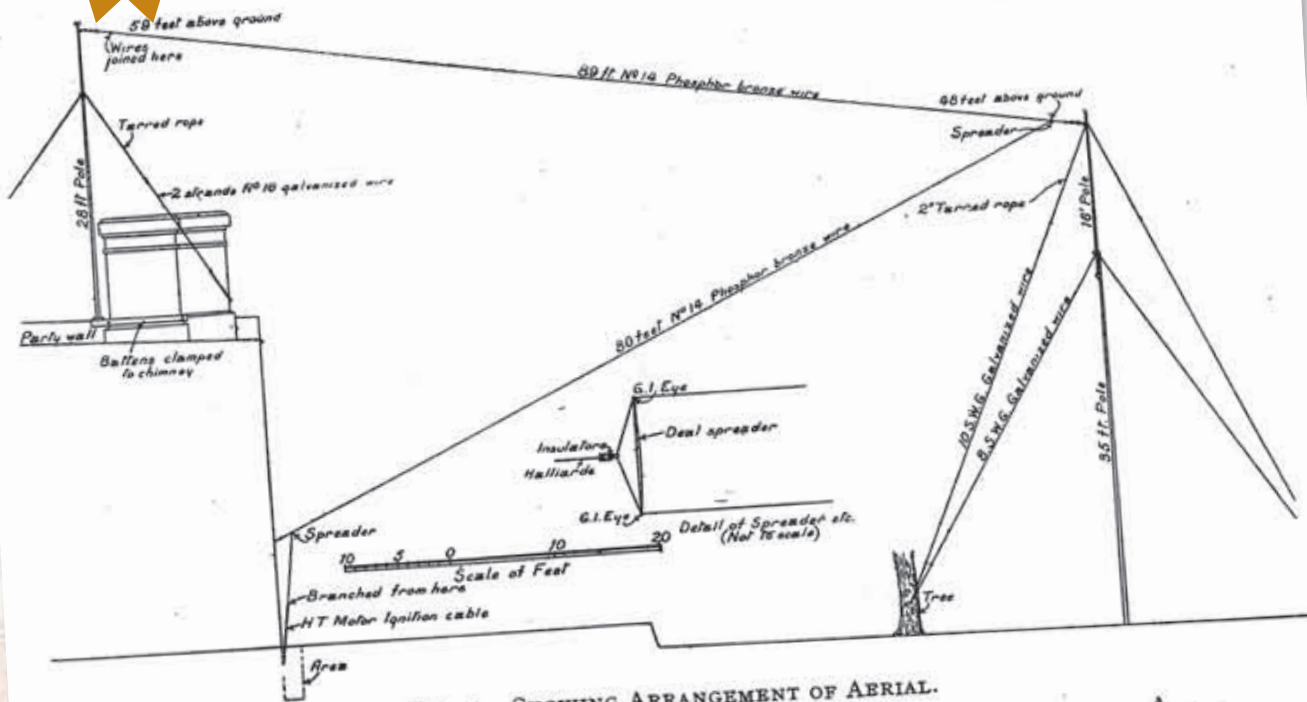
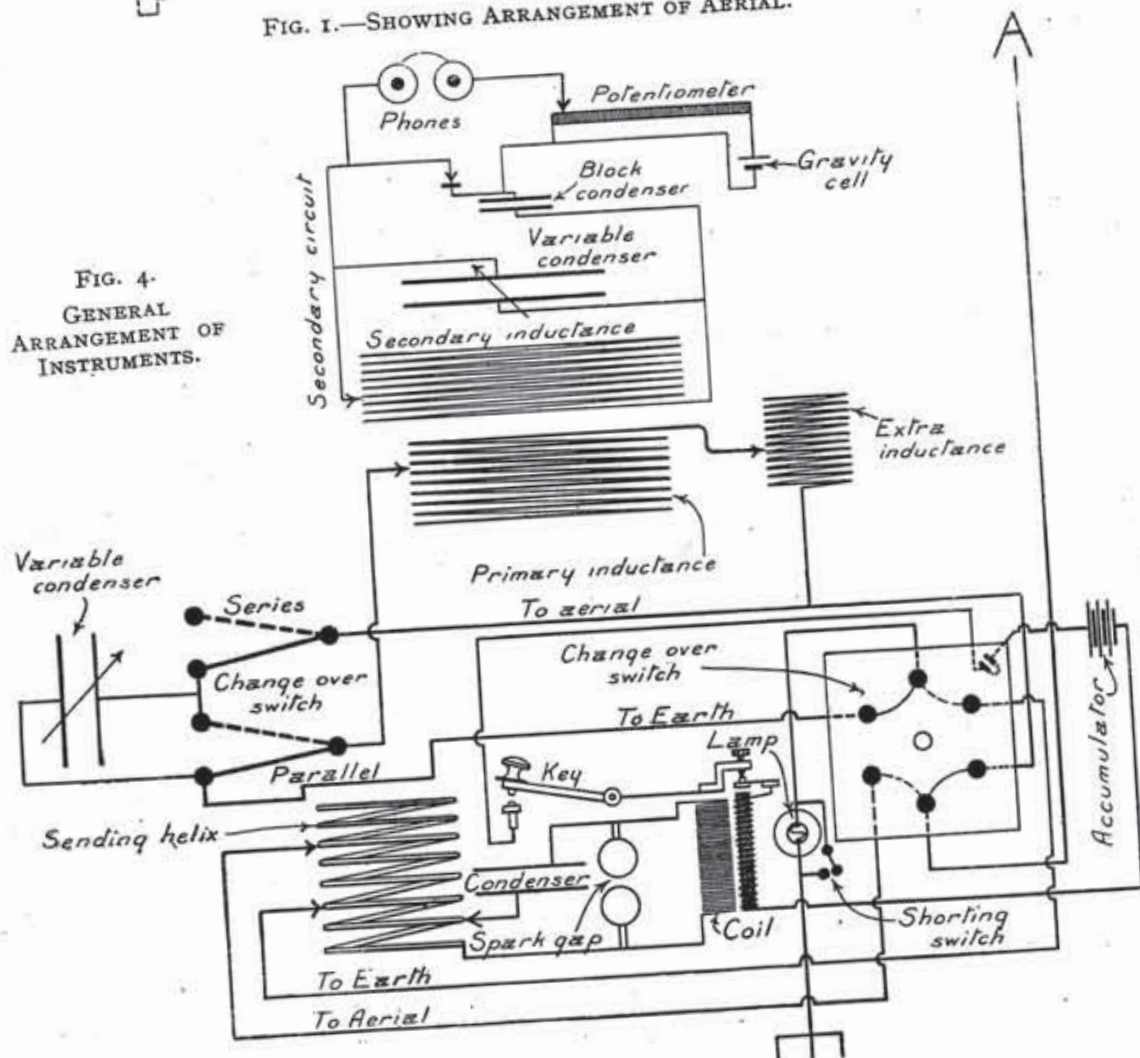


FIG. 1.—SHOWING ARRANGEMENT OF AERIAL.

FIG. 4.—GENERAL ARRANGEMENT OF INSTRUMENTS.



News, Views and Memories from the Early Days

The Wireless World May 11th, 1939

Proposed New Amateur Code – Saving Time and Reducing Interference

A new and comprehensive code, expressly designed for use of Amateur transmitters has just been submitted to the Radio Society of Great Britain. This code comprises a series of over 70 three-letter signals planned to convey practically all the technical information, weather, data etc., that Amateurs have occasion to exchange in the course of their transmissions. The draft code has been drawn up by a Suffolk Amateur, G3XT, of Stratford near Saxmundham, who, although comparatively a newcomer to the ranks of transmitting Amateurs, has held over 14 years experience of listening on the Amateur bands and is therefore conversant with Amateur requirements as regards a signal code.

Simplicity & Speed

It is claimed that the use of the new abbreviations, each of which begins with the letter A (a letter that is quick and easy to key in Morse), will

effect an enormous saving of time, as it enables any typical Amateur message to be sent, accurately and explicitly, with an approximately one half the amount of signalling incurred under the existing system. The originator suggests that, by eliminating superfluous signalling, the new 'A' code, if adopted, should do much to reduce the present interference on the Amateur bands.

An important advantage of the proposed abbreviations is that they are exceptionally easy to memorise (with a few unavoidable exceptions) with the initial letter of the subject covered. 'ATR?' for example, means What is your receiver? 'ATW' means Please wait, 'ASA' means What type of aerial are you using for transmission – and so on.

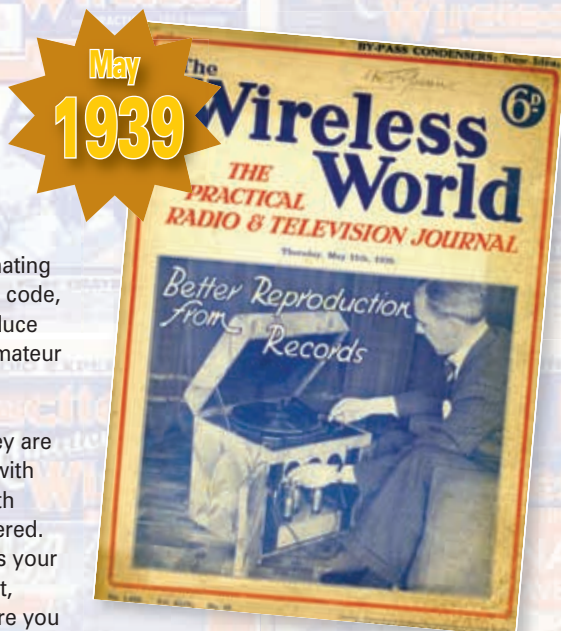
Meteorological Data

A section of the code is devoted to weather data and conditions of reception. This affords a ready means of indicating, briefly but accurately, the prevailing weather and reception conditions on the band at the time of the QSO. The enquiry signal 'AWX' (meaning What is the weather in your locality?) can be answered by abbreviations such as AWR meaning the 'The weather here is rainy' while more detailed information can be given if desired with the aid of the abbreviations AWB. AWT and AWV, referring to

barometer readings, temperature and visibility respectively.

'AWA' meaning Conditions of reception here are good and 'AWL' conditions improving are among the signals intended to be used in reporting on the state of the band at any given time.

As the new code is sufficiently comprehensive to cover the whole field of Amateur transmitting activities, it has been suggested that it could, if adopted internationally, supersede the present International Q Code as far as everyday Amateur use is concerned.

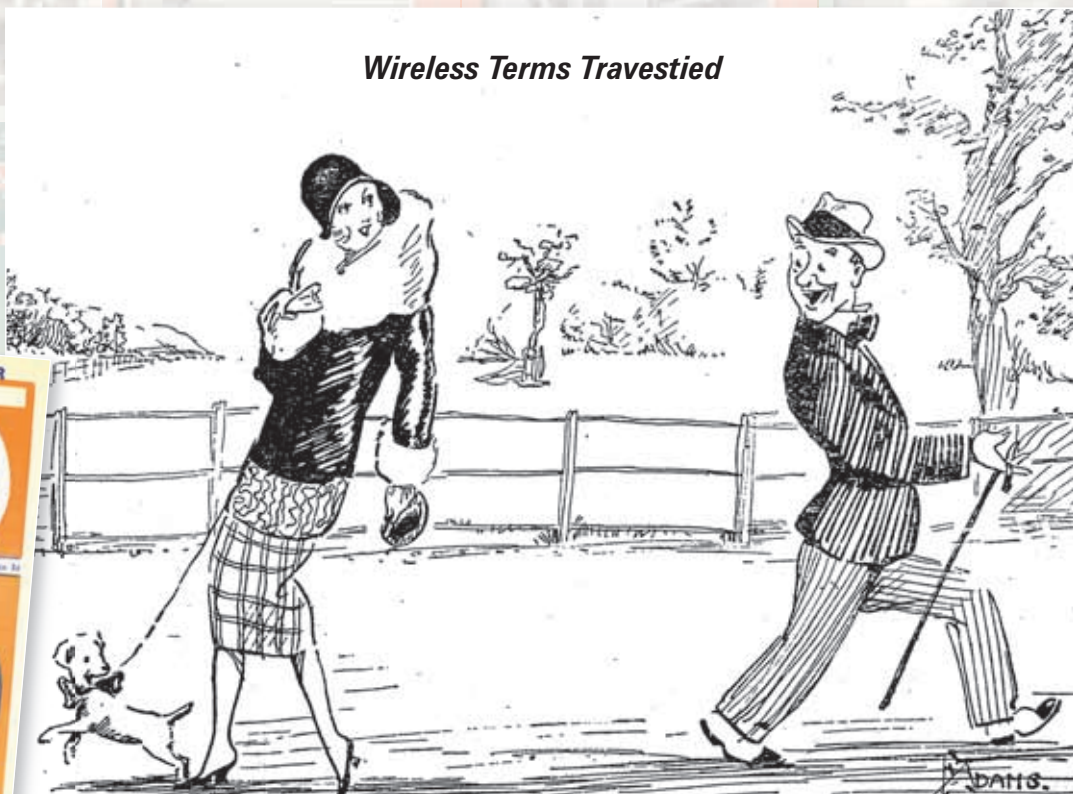


Dec
1924

Amateur Wireless
December 20th, 1924



Wireless Terms Travestied



Mutual Inductance

April
1930

★
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has now been
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black finish

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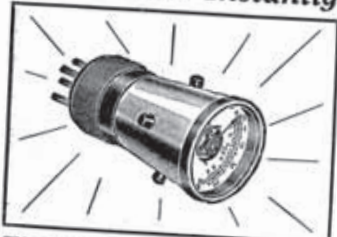
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April
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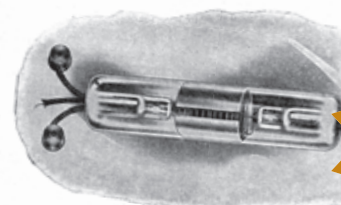
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Dec
1921

A Christmas promotion which was inserted into the December 1921 issue of the American Radio News magazine.

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The December 2007 issue is on sale on November 8th, 2007.
Don't Miss It!

Coming next Month: In the December issue, to round off PW's 75th anniversary year, Charles Miller the Editor of *The Radiophile* presents the third and final article looking back into the history of the wireless hobby. Charles has kept our readers and the PW staff spellbound with the background on the colourful personalities and amazing techniques used by enthusiasts in the 1920 and 1930s. This time, he goes back to the very beginnings where enthusiasts were often thought to be electrical magicians by the general public! It's bound to provide good reading - so don't miss it!

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Topical Talk

Rob's chance to air his views!

This month Rob Mannion G3XFD bases his topical chat on two letters from readers, published in *Radio Waves* in this issue. The first letter concerns the activities surrounding DXpeditions and the second involves *PW* and the rally and club news section.



Contest working on the Amateur Radio bands often raises the hackles of others trying to use our frequency allocations at the same time. However, I've never actually had any feedback from readers regarding other intense centres of activities, such as DXpeditions – until **Dave Ackrill G0DJA** wrote in. Dave, based near Derby in the English Midlands, obviously has had a few problems with DXpeditions!

From my own point of view I can say that on the whole (unless I want to work them and have to join the queue!) DXpeditions never cause me any problems. This is because the DXpedition operators don't seem to hog the whole band, as often seems to happen with contest operating. Additionally, I have found that many DXpeditions seem to have extremely efficient – and often very courteous operators – who are patient with the slow types, including G3XFD!

At the time of writing Topical Talk, I've not been able to work the **St. Brandon 3B7C DXpedition**. Despite my own lack of success I have worked many other operators who have successfully contacted the 3B7C stations and without exception they have reported on the superb operating style, friendly responses and dedicated attempts to work G and E1 stations, despite less than favourable propagation conditions.

Hopefully, before 3B7C finishes on 24th of September I'll be able to work them – most likely on 18MHz where I've heard them on many occasions but I've been unable to break into the pile-up on

either c.w. or s.s.b. So, it's obvious that I don't have problems with DXpeditions (especially when they are as well organised as 3B7C). But perhaps **you** might have objections or suggestion on the topic? If you do, please write in because it's not a subject we've covered in *PW* before and it would help evaluate the level of interest from the perspective of our readers.

Rally & Club News

Another letter, this time from **Steve Machin** in Sheffield, raises some very interesting points, which were originally mentioned during our long chat at the **Leicester Amateur Radio Show (LARS)** – despite the noise from racing cars! During our conversation I got the impression from Steve that he thoroughly enjoys the 'rally scene' and it's a major part of his enjoyment of our hobby. Steve is also looking for a club as he's keen on obtaining his M3 licence, although because his employers are re-locating, Steve's having to move south from Yorkshire towards the Midlands.

As the LARS has been held in the early Autumn, the show takes place at around the same time we're starting the forward planning for the next year's *PW*. As a result, Steve Machin seemed to delighted to hear what I was able to pass on regarding our expanded rally and club news section, which is to be introduced in the January 2008 issue. However, the success of our expanded coverage depends entirely on co-operation from everyone involved!

First, the expanded rally section

coverage will require photographs, maps and other information from rally committees to help promote each event. If rally organisers co-operate with us, by sending more than the bare details, we'll be able to produce a section packed with information to help attract visitors and promote the hobby.

Second, the club news section will cease to be text only from the January 2008 issue of *PW*, from when the rally and club news will form part of our new 'Social Scene' section. But the only way this expanded coverage can work is with the full co-operation of everyone involved! To help us you'll need to provide photographs and news with as much imagination as possible. It will be on a 'first-come-first-served' basis. But I have no doubt we'll cope with everything you send in.

Everyone involved with *PW* realises that the social sides of the hobby – including club meetings and events – are essential to help the hobby grow by attracting both regulars and newcomers. To this end we're also expanding the number of pages available for the *In Focus* club promotional feature. This, unlike the news pages or the 'Social Scene' section, can be dedicated entirely to a particular club or Amateur Radio related organisations. You can start the ball rolling by contacting me at the *PW* offices for the essential *In Focus Guide*. When you receive the guide the process starts, so I'll be looking forward to hearing from you and your club!

Rob Mannion G3XFD/EI5IW

coming next month

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Speech Processing: Ted Rule G3FEW suggests that you 'Turn it down' – after you've read his article!

Technical For The Terrified – Join Tony Nailer G4CFY as he takes the mysteries out of using bi-polars transistors, matching them and choosing the device to suit your design application.

Antenna Workshop Review: Tex Swann G1TEX tries out a very special, computer-based antenna analyser – the mini VNA Not an easy man easy to impress at any time – Tex thinks this system is the 'bees' knees'!

Going Loopy: Loop antennas can be big and difficult to handle. However, members of the **Poole Amateur Radio Society** have been trying out some unusual collapsible versions. Read the article and join in the fun!

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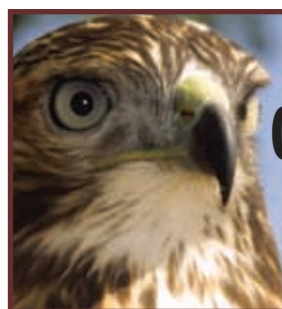
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KENWOOD

Listen to the Future

**VoIP INTERNET operation
with optional Kenwood Network
Command software**



Unique concept, brilliant execution. Kenwood's compact TS-480HX/480SAT is tailor-made for DX'ing. But its smartly designed standalone LCD control panel — featuring backlit keys to enhance operating ease — is equally at home on your desk, with the main unit up to 4 metres away. And wherever it is, this HF transceiver delivers an astonishing punch: 200W. Performance is equally impressive. For example, a quad-mixer provides RX dynamic range in the TS-950 class, while AF DSP processing offers many powerful features, including noise reduction, a speech processor, and AF filters. And of course you can enjoy all of the convenience of PC-based control. The TS-480HX/480SAT lets you enjoy the best of both worlds.

- Built-in automatic antenna tuner (100W model) ● Terminals for external antenna tuner, linear amp, PC ● Electronic memory keyer ● AF DSP features: ● AF DSP filters ● Beat-cancel, noise reduction ● TX/RX equalizer ● CW auto-tune ● Speech processor ● Optional 500Hz/270Hz band CW narrow IF filters, 1.8kHz band SSB narrow IF filter ● PSK31 compatible ● 5W minimum RF output, QRP compatible ● Electronic keyer ● Plug-in voice recording/synthesis unit available ● Packet cluster tune with TM-D710E & TM-D700E ● Supplied with mobile panel bracket, tabletop panel bracket and carrying brackets



HF/50MHz ALL-MODE TRANSCEIVER

TS-480HX

200W Model

- 200W output (50MHz: 100W) DC 13.8V operation
- 100W model available with built-in antenna tuner
- TX/RX AF DSP
- Compact construction for easy carrying
- Separate LCD control panel with speaker
- Continuous RX: 500kHz (VFO: 30kHz) to 60MHz
- TX: covers all Amateur bands 1.8MHz to 50MHz

TS-480SAT

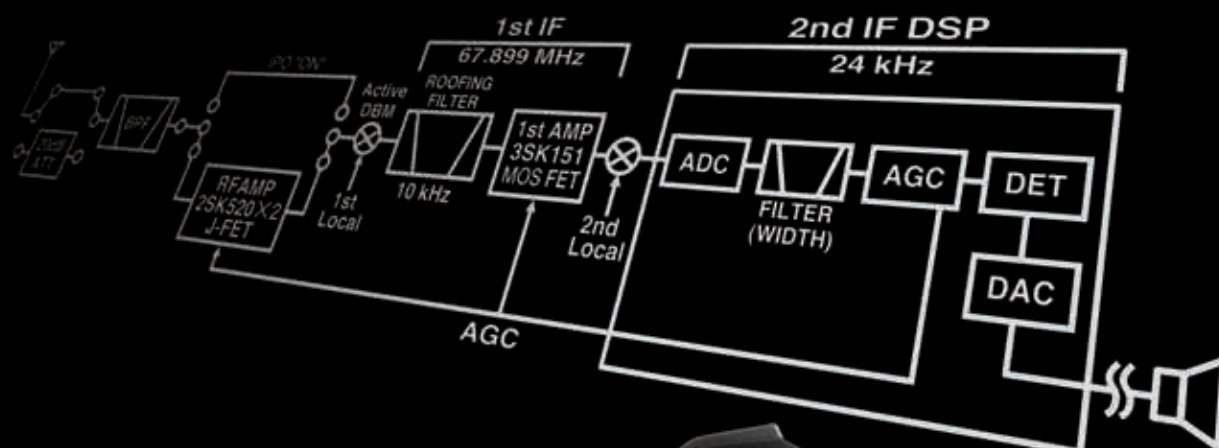
100W Model with Built-in Antenna Tuner



FT-450

HF/50MHz 100W All Mode Transceiver

World Class Performance in an easy to operate transceiver, with Yaesu's unique IF DSP



Available Now from £639.95 (inc VAT)

The FT-450 may be fitted with the optional automatic internal antenna tuner, the ATU-450.

The FT-450AT has the ATU-450 already installed.

YAESU

www.yaesu.co.uk