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Britain's Best Selling Amateur Radio Magazine

Reviewed

The Yaesu FT-450 HF/50MHz Transceiver

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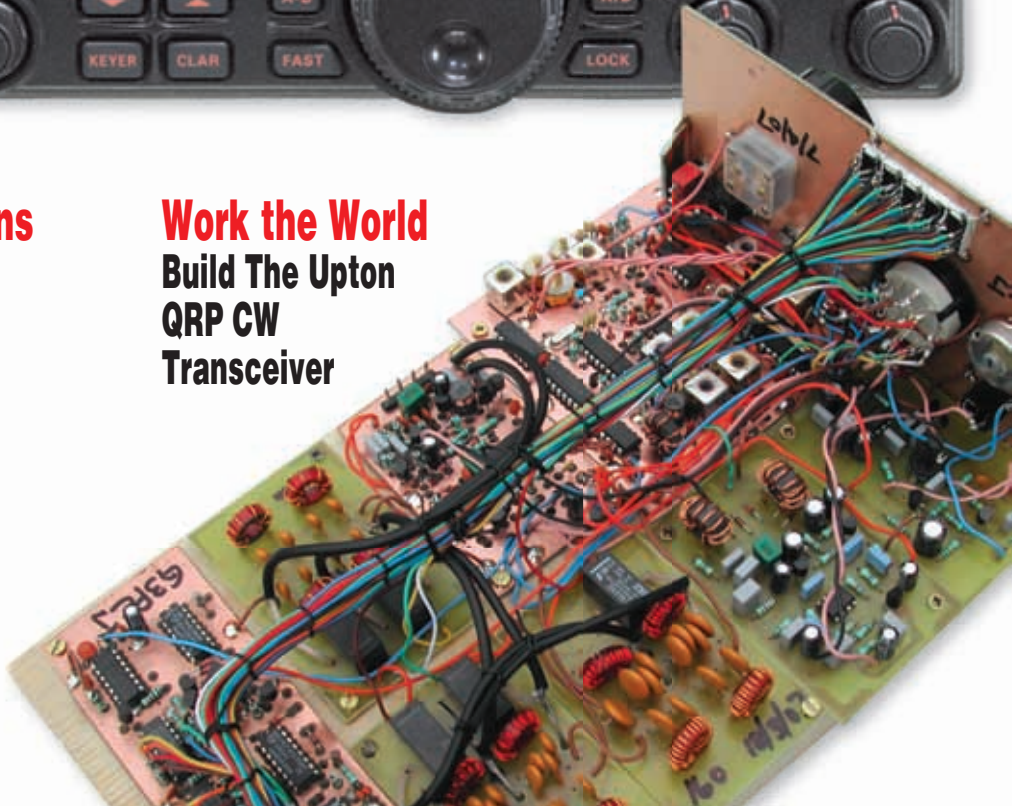
Practical Propagation Modelling

Work the World

Build The Upton QRP CW Transceiver



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The early days of hobby radio

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NEW - Performance Packed Radio

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

£1442.55 ex VAT
£1695 inc VAT

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 but 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

YAESU FT-450 NEW

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

£639 D

FT-450AT with built-in auto ATU £739

W & S present the new FT-450 with our inclusive 24 mont 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.

KENWOOD TS-2000 Package Deal

All-Mode Multi-Bander

Package:
TS-2000uk
25 Amp AC PSU
1.8 - 430MHz Pwr Meter
RG-213 patch lead

**1.8MHz - 440MHz *1200 MHz Option *100W 1.8 - 146MHz *50W 70cms 10W 23cms *Dual Watch HF/VHF *Comprehensive DSP *DX Cluster Auto Tune *Built-In TNC *Auto ATU 1.8MHz - 52MHz *Transverter Display*

Package Price £1379 D
Radio alone £1295 D

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

1.8-30MHz +6m 100W
£1695 D

FT-2000D 200W
£2399 D

NEW PRODUCTS - NEW PRODUCTS

KENWOOD TM-V71E 0% Interest!*

NEW

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

£269 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

NEW Bluetooth

YAESU FTM-10R/E

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

NEW LOW PRICE!

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

£499 D

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

YAESU

LOW PRICE!

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

£349 D

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

Deluxe Base Station HF Transceiver. 1.8 -30MHz, 50-54MHz (160m-10m + 6m Amateur Bands) Tx

FT DX-9000D 200W internal PSU **£7,299 D**
FT DX 9000MP 400W ext. PSU **£8,299 D**
FT DX-9000 Contest 200W no TFT **£3,799 D**

ICOM IC-7700

NEW

Billed as a Contest Radio, the design takes fearures 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

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ICOM

IC-7800 — Buy Now Pay Later!

The Ultimate Icom! **0% Interest!***

FREE SP-20 Base Station Speaker with Filters worth £164.95

200W HF Built-in AC PSU

£6,400 D

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

Includes Travel Mite Dual Voltage PSU

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IC-703 — Buy Now Pay Later!

0% Interest!*

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

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KENWOOD

TS-480SAT — Buy Now Pay Later!

0% Interest!*

100W HF+6m

£679 D

*1.8MHz - 52MHz 100W *Built-In Auto ATU
*Removeable Front Panel
*Comprehensive DSP
*Speech Processor *Quad RF Mixer
*CW Message Recorder *PSK31 Compatible

TS-480HX - As Above but 200W and no ATU **£765 D**

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-706MkIIG, 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 £1089 D
2m / 70cm 100W Base station all - modes
Option for 23cm module (**UX-910 £359**)

IC-910X £1239 D
As above but with 23cm module ready fitted and a big saving as well.

IC-2200H £179.95 D
2m 55W FM mobile with rugged construction and with digital option.

IC-2725E £279.95 D
2m / 70cm radio. Easy to operate and install and a lovely detachable head.

Kenwood VHF/UHF Mobile/Base

KENWOOD TM-271E

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

Built-in CTCSS & DCS encoder / decoder.

New Low Price! **£149 D**

TM-G707E £199 D
Dual Band 2m & 70cm with detachable front

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/70cmDualband 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 seperate 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 hand-held 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-2E 2m/70cms miniature £99 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

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MFJ

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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
VERSA TUNER 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
SmarTuner 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 SmarTuner 1.8 - 30MHz, 1.5 - 200W (PEP) VSWR: Typically less than 2:1

SG-230 £339.95 D
The Original Long Wire SmarTuner - 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 9kg

£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 needed. 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

HUSTLER

6-BTV

6-BTV £229.95 D
*6-band vertical, 7.3m tall, 1kW.
*Coverage: 80, 40, 30, 20, 15, 10m
Can be used at ground level with earth stake. Ideal for small gardens

5-BTV £199.95 D
*5-band vertical, 7.64m tall, 1kW.
*Coverage: 80, 40, 20, 15, 10m
Can be used at ground level with earth stake. Ideal small gardens

4-BTV £169.95 D
*4-band vertical, 6.52m tall, 1kW.
*Coverage: 40, 20, 15, 10m
Can be used at ground level with earth stake. Ideal small gardens

Adonis WX-2400

NEW

Wireless Mobile Microphone
- Operates on 2.4GHz
- Easy to install
- Control unit powered through external lead
- Remote powered from coin cell
- Allows private conversations
- Tx & Rx PTTplus mic attached to remote unit
- Velcroed to steering wheel

Remote handsfree operation of your mobile rig in the car but without Bluetooth involvement. Mic lead not supplied.

£109.95 C

Optoelectronics Spectrum Scout

NEW

Frequency Finder 10MHz - 2.6GHz with data display 1000 memories
- Frequency range: 10MHz - 2.6GHz
- Displays FCC bandplan info with each frequency
- RF signal strength bargraph
- Reaction Tune with some receivers
- Beeper & vibrator alert
- 11 different step sizes for data

The Spectrum Scout is a frequency counter that is capable of capturing the frequeny of a nearby transmitter and displaying the FCC bandplan data for that frequency.

£399.95 C

Garmin Nuvi-200

NEW

- High sensitivity integrated GPS receiver by SiRF
- Integrated flip-up GPS patch antenna
- 320 x 240 pixel display
- Bright TFT display, 64K colours
- White backlight & touch screen
- Powerful built-in speaker
- Features 3D mapping & 2D Track-Up or North-Up perspectives

£149.95 C

We Stock A Massive Range of Garmin GPS Products Visit www.wsplc.com to see more

Ramsey ABM-1 Airband Monitor Kit

NEW

Passengers can now hear the crew's VHF transmissions - Anywhere - Anytime No tuning required!

A passive airband monitor with no oscillator or IF - so no risk of interference even inside an aircraft cabin. It is highly sensitive (2uv) and will hear all local aircraft and is even safe to use inside aircraft cabins. The radio is only available in kit form (small components are ready mounted on board) and it takes around 3 hours to build. Has everything you need including smart case and earbud phones. PP3 battery required - not included.

£79.95 C

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

Practical Wirelesscontents

October 2007
On Sale September 13th
Vol. 83 No. 10 Issue 1206
(November 2007 Issue on sale October 11th)

60 Practically Yours
75 Years of Heritage & History
Looking back at some rather special news items, articles and other material from the hobby radio magazines that were around in the 1920s before *Practical Wireless*.


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October Regulars

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Roger Cooke G3LDI shares his experience of testing the Yaesu FT-450 HF/50MHz transceiver – find out why he says Yaesu have another winner! Why not have a go at building the Upton QRP CW transceiver as the autumn draws in? The perfect time for nights in the shack.

Design: Steve Hunt

Photographs: Yaesu UK Ltd., Tim Walford G3PCJ

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Keylines

Rob's chance to air his views!

This month, Rob Mannion G3XFD reports on bad behavior on 14MHz and GB75PW on-air activity.

Over the last few months, I've mentioned the h.f. bands Scratchers & Whistlers on a number of occasions. Indeed, it was such a problem for many of our readers that with the help of **Geoff Cottrell G3XGC** – we published the Huff-Duff 7 directional loop antenna system for use on 7MHz.

Some Huff-Duff 7 constructors have since drawn my attention to an extremely unpleasant form of deliberate, anti-social behaviour up on 14MHz. The nuisance seems to be caused by an Amateur using an Italian callsign and speaking excellent English.

Personally, I don't use 14MHz much, apart from listening to the IBP beacons on 14.1MHz. My preference is for 18MHz where my inverted-V antenna works exceptionally well. However, GB75PW has been operated on 14MHz recently – on August 11th – from the **Poole Radio Society**.

We came across the Italian nuisance operator (his objection seems to be only against DXpeditions) as he aggressively joined in the 'pile-up' calling GB75PW. Fortunately, we managed to avoid him without becoming involved in any aggression ourselves and before **Jim Lee G4AEH** arrived from Nuneaton in Warwickshire. Fortunately, Jim's professional broadcaster's voice (you'll often hear him on BBC Radio 4 and Radio 7) helped us overcome appalling conditions on the bands and he managed to worked many of our readers.

Since our GB75PW session on 14MHz I've heard the Italian station using a continuous tape recording system to effectively block a particular frequency on 14MHz. I don't know what the Italian operator's objectives are but the **International Amateur Radio Union** (Region1) are well aware of the behaviour of such anti-social operators and are trying to overcome the problem.

My recommendation is that if you hear someone acting in an anti-social way, that you don't work them and make the situation worse. Instead, you should contact your national society and the IARU representative in your own country.

The more we complain, the more evidence can be provided by the IARU on our behalf. Such objectionable operators should have their licences revoked and I hope that my personal letter to the Italian licensing authorities will help remove the nuisance operator from the bands.

The GB75PW QSL Card

Many readers who have contacted GB75PW have sent QSL cards directly to the offices and are beginning to ask me, "What's the delay Rob?" The simple answer is that producing *PW* takes priority at all times and we try to fit in reply to your QSLs when we can! I'm sorry if you are waiting for a card but you can be assured you'll get a QSL if you have provided a 50p stamp!

We have had a few cards arrive via the bureau, thanks to the RSGB's Special Events QSL Manager **Mike MW0CNA** and these will be dealt with as soon as we have time.

Unfortunately, some QSL cards are being delivered to my home QTH address – as published in the *RSGB Yearbook*. And although I have no real objection to getting the incoming direct cards for GB75PW at home – there's every chance that I will mislay the cards at home or forget to take them to the office! So, please avoid my home QTH and send them to the *PW* offices!

On Air With GB75PW

On **Friday, October 7th**, **Tex Swann G1TEX** and I have been invited to the **Ribblehead Railway Museum** in Preston Docks, Lancashire to operate GB75PW, Our hosts are the **Central Lancashire Club** and we'll be pleased to work you on 7 or 14MHz.

Saturday October 8th brings the opportunity to meet *PW* friends at the Rochdale G QRP rally and mini-convention at **St. Aidan's Church** in Sudden, Rochdale. We hope to meet you there!

Thanks to the kind offices of the **Kilmarnock & Loudon Club** in Ayrshire, Scotland, GB75PW will be on air on **Thursday, October 18th** and **Friday October 19th**. **Len Paget GM0ONX**, has very kindly offered to collect me from Glasgow airport and transport me to and from the club's HQ. We'll be operating on 7 and 14MHz during both days and I hope we can have a QSO with as many readers as possible. I'm very grateful to the club for the facilities and Len Paget's kind help.

During my week in Ireland (**November 13th-20th**) for the **Mayo Rally** in **Knock** on **Sunday November 18th**, I'm driving up – accompanied by **John Corless EI7IQ –** to the **Foyle & District Amateur Radio Club** in Northern Ireland on **Thursday 18 November** to operate GB75PW. The very active club has invited me for my second visit and let's hope conditions will be good on 7 and 14MHz enabling the team of operators to provide you with a good QSO!

Rob Mannion G3XFD/EI5IW

Send in your thoughts and win a voucher!

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 callsign 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.

New Entrants Into Amateur Radio

Star Letter

● **Dear Rob**

I have been following the interesting discussion about new entrants to our fascinating hobby and the importance of always initiating and helping beginners in each generation. A number of experienced people (but limited in their thinking), often assume that because it's been done before, there's no need for further beginners' articles or series in magazines like *Practical Wireless*. I'm always gratified to realise that all the staff of our favourite magazine, do not take this view.

I believe it was the scientist Heisenberg who, having invited Max Born, an eminent Quantum theorist, to address an Undergraduate group in his University, said to him after he'd shown shock and horror when he looked through the side door and seen Einstein, Schrödinger and other very eminent top scientists sitting along the front row, "My dear Born, do not underestimate the pleasure you give to the senior experts, when you go over the basics and introductory material of their youth – they still find it exciting." During his talk, Born noticed the excitement, nodding and nudging from these eminent world leaders of the time.

It has been the same in our Radio Club. We offer elementary talks and lectures to our beginners. We run Foundation courses. The old timers and experienced often pack in and listen to the same stuff again and again, smiling and nudging.

I've noticed the same phenomenon in myself. During club meetings, I have run for them, youngsters, many still just children, "read a paper" on a topic. I remember a youth doing Ohm's Law. He'd obviously just cracked it. What enthusiasm! He lectured on that topic as though it had just been discovered – in fact as though **he'd** just discovered it! I'd heard Ohm's Law perhaps hundred of times but that boy enthralled all of us. I clapped as loudly as any at the end.

I remember some years ago that *PW* published an article by **Richard**, one of the young members in the club over that period. Oh, he must have been 13 or 14 at the time. I believe it was about **Michael Faraday's** work; one of the fathers of everything we do, of course.

Therefore, I had a pleasant memory of the youthful enthusiasm (which we **must** never stifle), when I read the letter from **Ross Woolgar** in the August *PW*. Yes, I think we must offer leadership and progress for such young people. There's little stimulating input from other rather ossified 'institutions' in our modern society for them.

We must maintain that slightly child-like enthusiasm for what is a great movement; advancing scientific exploration, international friendship and trusted comradeship for all and sundry without class, status or prejudice. Long may Amateur Radio thrive. Also, long live *PW!* Affectionate regards to you and the staff at *PW*.

Ken Smith G3JIX
Canterbury
Kent

An interesting letter Ken! Please join me on the Topical Talk page for further discussion. ***Rob G3XFD***

Narrow Band Television

● **Dear Rob**

I am very interested in the remarks by **Mr John Tuke G4BST** on page 52 of the September issue of *PW*. Like him, I did not see any high definition TV until the middle 1950s. However, I did see a 30-line picture in about 1935. The receiver used a mirror drum, Kerr cell and two crossed prisms. Happily, anyone wishing to see or experiment with mechanical TV can do so and I am writing to say that there is a small world-wide association called **The Narrow Band TV Association** of which I am a member.

In February 2003, a team of narrow bandwidth TV enthusiasts, **G3GMZ**, **G4JUN** and **G3SDQ**, sent a mechanical picture to **K2MP** in New York on 21MHz. The picture was displayed in the USA using a *Daily Express* aperture disc machine. Additionally, K2MP also recorded the video signal on a disc and retransmitted it to the **Amberley Chalk Pits Museum** in West Sussex from which it had been transmitted. There the picture was again recorded. The three gentlemen in the recording are all easily recognised, incidentally the museum had only transmitted with 100W and Vee beam antenna 70ft above ground level.

The society holds an annual convention in April at Loughborough, which is always fascinating. Plenty of our members can now transmit three-colour colour images using 32 line equipment. We have used 32 lines as that figure represents two raised to the power of five.

I would advise anyone interested to join us to contact **Mr D Pitt, 1 Burnwood Drive, Wollaton, Nottingham NG8 2DJ**.

The association holds a net on s.s.b. net on 3.7MHz at 0800hrs on Saturdays, generally controlled by **Ted Hardy G3GMZ** and our website can be found at **www.nbtv.org**

Personally, I think the BBC should have run mechanical TV alongside the high definition system.

David Buddery G3OEP
Great Yarmouth
Norfolk

Mechanical television is fascinating David! In these days of conserving energy and frequency spectrum, narrow band television systems such as those you support should be admired. ***Rob G3XFD***

Encouraging New Entrants

● **Dear G3XFD**

Now that *PW* is the only Amateur Radio magazine available on the newsagents' bookshelves it must have an increasingly extremely important part to play in promoting our hobby. Because of this I'm very pleased that the magazine is to introduce a new column for the not-so-experienced.

One of the reasons I think *PW* has such

letters

an important part to play is because there must be many people – like myself – who work shifts and generally work unsociable hours and find it impracticable to join clubs. For those of us who don't belong to clubs *PW* really fills the gaps, making up for the loss of the social life of a club. However, I enjoy the specialist rallies as they provide me the chance to meet other enthusiasts and the staff from *PW*.

The main reason why I'm writing, is to stress just how important *PW* is in encouraging new people into the hobby. Without *PW* I would not have been able to progress to where I can build test equipment and other electronic projects. Radio Basics helped me to get off the ground and then along came Technical for the Terrified and **Tony Nailer G4CFY's** other superb series Doing it by Design. These articles, along with **G3RJV's** Carrying on the Practical Way, provide a unique service for the radio enthusiast.

Thank you Rob G3XFD, **Tex Swann G1TEX** and to the authors who make *PW* the institution it is for myself and other readers. I look forward to meeting you and Tex at Rochdale for the last rally before G3RJV retires from St. Aidan's Church and a new venue is found. It should prove to be an enjoyable Saturday at St. Aidan's. Keep up with the good work at *PW* everyone, your readers need you and your understanding attitude!

Stan Winslow
Knutsford
Cheshire

Thank you for your support Stan! Having met you on many occasions I know that your career as a senior nurse means that shift work is essential. I'm always grateful that you and your wife – also a nurse – find time to visit the rallies at Rochdale, etc. You can also be assured that everyone involved with PW *is fully aware of the responsibilities that go with working on the magazine as we cater for a variety of interests and levels of knowledge, as we aim for an even better* PW. ***Rob G3XFD***

Basic Educational Problems Barrier

● **Dear Editor**

Thank you for agreeing to publish my letter in such a way that I can convey my very great concerns (regarding educational standard of youngsters entering our hobby) without causing unnecessary offence to my local club and the younger people that we are trying to help. But, before I explain my concerns, please understand that my worries do not extend to the enthusiasm of the younger students – instead it's intended to focus on the very poor educational standards that our schools seem to be producing. Indeed, and perhaps unfortunately, I write to you as a teacher with many years' experience in the profession, mainly specialising in science subjects and mathematics in secondary schools.

With the exception of some private schools and other educational institutions – where students can often be selected by their academic capabilities, there are students (I'm not including those who come under the 'special needs' category) who can complete secondary education with the absolute minimum of knowledge of science subjects. In fact, it's quite common for me – as registered Instructor training candidates for the Foundation Licence – to meet students who have never been taught anything about the primary cell, or anything on electricity or magnetism.

I was the product of a Secondary Modern School in the Midlands, in the early 1960s, who left school with a good understanding of English, mathematics and basic science. I didn't attend university and went straight into an apprenticeship in the machine tool industry, which was supplying the large local motor car factory. The foundation provided by my secondary education was then built on by the day-release and other courses. I then attended the local technical college RAE course, getting on the air in 1968.

With the rapid decline of the British Motoring manufacturing industry I was made redundant and then decided to try and put something back into the system that provided me with so much practical education in engineering and science. I was accepted for Teacher Training in a college for mature students and since qualifying I have worked in secondary education, mostly in large Comprehensive Schools and expect to retire within the next five years. However, in my years in the teaching profession, which, incidentally, I have found exhausting but rewarding, I have found few students who are interested in science subjects – despite the enthusiastic efforts of excellent colleagues and myself. Those who have excelled have made us feel very proud!

One of the areas of most concern is the basic reading standards of many of our students (who are apparently bright in other ways). Their comprehension of the written word and limited knowledge of even using maths as a basic tool is a very great handicap. It seems quite possible, despite my efforts, for a young person to go through school and emerge at the other end with a low very understanding of reading, writing and basic arithmetic and this is what we often discover during the Foundation Licence training.

Fortunately, entering our hobby can spur many students on to see just how useful reading, writing and science can be. Indeed, it seems as though the spark comes when they realise that maths can be as useful as the proverbial spanner! So, I think that – along with radio training – we have an important part to play providing education, especially for those who have seemingly passed through the system without receiving many of the benefits they deserve.

I thank the Editor for agreeing to allow me the anonymity demanded because of the sensitive but necessary nature of this letter. The possible – unintentional – offence it might cause, would no doubt deflect attention away from the need for us to work hard with the students, to help widen their foundation of knowledge.

A Science Teacher (Licensed Amateur)
'Somewhere In England'

Editorial statement: It's not our normal policy to publish anonymous letters and it's exceptionally rare for me to agree to do so. However, I think the letter from, 'Science Teacher' is so important I readily agreed to publish his concerns. I invite readers to join me on the Topical Talk page for further discussion. ***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.

September 30th
Belgium Amateur Radio & Computer Rally
Website: www.ON6LL.be
The Belgium Amateur Radio & Computer Rally will be held at the 'La Louviere Expo', La Louviere, Belgium (50km south of Brussels). Doors will open at 0900 and talk-in will be available on the repeater frequencies of 146.600 and 430.325MHz.

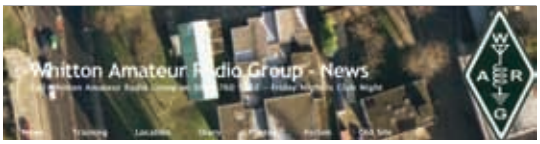
October 7th
Nantwich Bunker Trust Surplus Electronic and Electrical Sale
Tel: (01270) 629219
E-mail: coldwar@hackgreen.co.uk
Website: www.hackgreen.co.uk
The Nantwich Bunker Trust Surplus Electronic and Electrical Sale is a sale and disposal of military and commercial radio equipment and electronic surplus at The Secret Nuclear Bunker, French Lane, Nantwich, Cheshire CW5 8AP. Doors open at 1000. Booking forms can be downloaded from the website given above.

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, County Durham DH3 4JD. Doors open 1030 hours. There will be free parking and easy access, refreshments. Admission, £2. The rally will include radio, electronics and computer traders, Bring & Buy and talk-in.

news & products

Send all your news and club info to Donna Vincent G7TZB at the *PW* editorial offices or E-mail: **pwnews@pwpublishing.ltd.uk**

Whitton Amateur Radio Group



The **Whitton Amateur Radio Group**, which is based in West London, is a registered examination centre for all levels of the Amateur Radio Licence and is currently offering courses for the Foundation and Intermediate levels. If you are interested in applying to attend either course, you should E-mail **Chris** at **chris@the-grooms.com** or telephone him on **0870 6705 082**.

Please note that at present the Whitton Amateur Radio Group is not offering an Advanced examination course but are planning to offer revision evenings before each exam. The Group meet every Friday from 2000 hours at the **Whitton Community Centre, Percy Road, Whitton, Twickenham, Middlesex TW2 6JL**. For more information on joining Whitton ARG or their activities take a look at **www.warg.info/**

World Rally Special Event Station

From September 29th to October 28th listen out for **8J8WRC**, which is being aired to celebrate the FIA World Championship Round 14 Rally Japan 2007. All QSL requests should be placed via the **Japanese Amateur Radio League (JARL) QSL bureau, Shobara Post Office, Shimane 699-0588, Japan.**

Digital Selective Calling

Digital Selective Calling (DSC) is still a topic that generates much debate among the maritime community, so **Icom UK** is offering to visit organisations and radio clubs to talk about the issues raised by this subject. Where relevant, they will customise presentations, making them as general or as technical as required (from talking about the safety benefits of radio in general to the operation of a particular DSC unit) and all will be in an informative and entertaining way.

If any club is interested, they should contact Icom UK direct via E-mail to **marketing@icomuk.co.uk** with possible dates for a visit.

Smith Chart Slide Rules Presentation

On Sunday, August 12th, 2007 **Murray Niman G6JYB** of the **Chelmsford Amateur Radio Society** (CARS) presented two Smith Chart slide rule calculators to **Trish Robinson** of the **Sandford Mill Museum**. The calculators were made by **Scanners Limited** of **Bill Quay, Gateshead**, who made the gimballed platforms for the radar division of the Marconi Wireless Telegraph Company. Eventually, Scanners Limited were bought by Marconi and became a manufacturing and assembly plant for Marconi Radar.

The Smith Chart slide rules were owned by **Mr H M Chandler** (known as Vic to his friends) who worked at the Gateshead plant from the late 1940s to late 1950s. Vic died some years ago and they were found by his son **Nick** Chandler following the recent death of his mother and consequent house clearance. Nick, a Chief Scientist at BAE Systems, gave them to Murray G6JYB who is one of the tutors for the CARS Amateur Radio courses.

Smith Charts enable graphical plotting of impedance, Z and its inverse (i.e. admittance, Y) for design of matching circuits – a process that is performed by computers nowadays rather than by hand. The central circular chart can be rotated and the picture shows them in the rarer Admittance position – as used in the Marconi and CARS roundel logos.

Normally, Smith Charts are used in the Impedance position. The chart was developed by and named after Philip H Smith in 1938. His original book is a collector's item. In addition to the calculators, the Marconi company printed a wide range of graph papers and pads including Smith charts under the MG (Marconi Graph) series.

Details of the Chelmsford ARS courses are available from the training organiser **Clive G1EUC, Tel: (01245)-224577/(07860) 418835, E-mail: training2007@g0mwt.org.uk website: http://www.g0mwt.org.uk/training**

Piastowski Klub Special Event Call

Members of the Polish club Piastowski Klub Krotkofalowców will activate their club station using the special event callsign **HF40PAZ** to celebrate their 40th anniversary. The station will be on the air between September 1st and 30th. All QSLs should be via **SP6PAZ, Piastowski Klub Krótkofalowców, PO Box 230, 45-956 Opole 1, Poland. Website: www.sp6paz.int.pl/**

Send all your news and club info to Donna Vincent G7TZB
at the *PW* editorial offices
or E-mail:
pwnews@pwpublishing.ltd.uk

Beginners' Workshop Success

From left to right; Jon Phillips M3UJO, Nandan Patel M3UNP, Saleem Mohammed, Bea Smith, Victor Nikolaidis 2E0VNN, Ubong Ukommi M3UIU. *Photo courtesy of Trevor M5AKA.*

Carlos Eavis G0AKI working Oscar 51 from GB4FUN.

The **AMSAT-UK** Group has held Beginners' Workshops at their Annual Colloquium in Guildford for the last 20 years. The workshops are aimed at showing newcomers how to get started in the exciting world of Amateur Satellite Communications. Many are amazed when they discover that they can communicate through Amateur Satellites or speak to Astronauts on-board the *International Space Station* using little more that a hand-held dual-band f.m. transceiver.

When the new Amateur Licence structure was introduced in 2002, neither Intermediate nor Foundation Licence holders were allowed to use satellites. As a result there was a significant drop in the numbers coming into this branch of the hobby. Because of this, AMSAT-UK campaigned to have access to the Amateur Satellite Service made available to all Amateurs and the UK Regulator first agreed to give Intermediate holders access and then in December 2006 gave full access to Foundation holders as well.

The results of this were clear to see at this year's Beginners' Workshop with a sharp increase in the numbers of Foundation and Intermediate licensees attending.

Among the many new attendees were six members of the **University of Surrey** (UoS) **Electronics and Amateur Radio Society** (EARS) who are all Foundation or Intermediate holders. The Society's Chairperson **Bea Smith** had only recently passed her Foundation Licence examination and was still awaiting her callsign.

In total, 16 people attended the Beginners' Workshop, which was run by **Dave Johnson G4DPZ**. It was followed by a visit to the Radio Society of Great Britain's Radio Communications van GB4FUN manned by **Carlos Eavis G0AKI**.

If you're intested in Amateur satellite operation why not join AMSAT-UK and receive *Oscar News*? You can join on-line at **https://secure.amsat.org.uk/subscription/** or contact **Jim Heck G3WGM, Tel: (01258) 453959**
E-mail: g3wgm@amsat.org
Website: http://www.uk.amsat.org/

Liquid Tape

Liquid Tape is the latest product to be launched by SOTA Beams and is designed to seal antenna connections with its fast-drying paint-on synthetic rubber compound. Because Liquid Tape penetrates the braid of coaxial cable connections, it stops water getting in by capillary action.

Tests carried out by members of SOTA have shown that it has low losses even in critical applications such as fixing the turns on toroids. Liquid Tape also has many other uses for the hobbyists. To find out more and how to order, take a look at **http://www.sotabeams.co.uk** Liquid Tape costs £8 plus £1.50 P&P per can.

New Number - Don't Forget!

Don't forget that PW Publishing Ltd has a new telephone number. To make life easier for everyone, we now have just **one** number.

The new telephone number is **0845 803 1979** and is the only one you need to reach any department or individual at PW Publishing Ltd. It's simple, whether you want the Book, Finance, Editorial, Advertising or Art department, just ring **0845 803 1979** and ask for the relevant person or department. Our FAX number is reverting back to **(01202) 659950** and our Subscription department number remains as **(01442) 879097**. Update your records today!

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Rochdale and District Amateur Radio Society

Rochdale and District Amateur Radio Society will be holding their 13th Annual Traditional Radio Rally at St.Vincent's Church Hall, Off Edenfield Road, Cutgate Rochdale on Saturday September 29th starting at 1030 hours. Entrance will cost £1.50.

Last year, the event was the biggest it had ever been, with over 300 visitors and 35 traders and private stalls in attendance. If' you're quick there may still be some tables available at a cost of £10. So, why not bring along your radio related items for sale or utilise the Bring and Buy Stall?

Refreshments will also be available throughout the event and there will be a raffle with great prizes in support of the **Floyd Neuro Rehabilitation Unit** where recently two club members have received excellent care following strokes. For more information contact: **Dave G0PUD** on **(01706) 632502** or by E-mail to **dave.shaw@zen.co.uk**

Book Review

Collecting Vintage Radios **by Tony Thompson**
(Crowood Collectors' Series)
Published by Crowood Press
Ramsbury, Wiltshire
ISBN-13 9781861269492.
(Available from the *PW* Book Store Priced £19.95 plus P&P)

Rob Mannion G3XFD writes: When I was sent a promotional dust jacket and details of this book by Crowood Press, I realised it was going to be good. However, when the book arrived I was even more impressed because it's superbly illustrated and extremely well presented. In fact, I think its a book that any *PW* reader would thoroughly enjoy – both **Tex Swann G1TEX** and I were impressed by the quality and when it comes to books we're not that easy to impress!

As far as I know, I've never met or spoken to the author Tony Thomson. In fact, on reading the fascinating potted history of *PW* and Fred Camm in the book (page 87) I'm not so sure if he knows that *PW* is still published and has copyright over some of the material used! Despite this the author has done an excellent job in writing and presenting the subject.

The book is profusely illustrated with excellent photographs and the author provides an interesting history of the early days of wireless, featuring the equipment then available and the personalities behind the early success of broadcasting. Vintage sets from the 1920s, 1930s, the Second World War and the 1940s are superbly illustrated and the techniques used are discussed. It's written by someone who knows the technology and certainly cannot be described as a 'coffee table' book relying on the 'arty' side alone. The book provides a truly fascinating and entertaining read.

Receivers from the 1950s and onwards are featured in profusion and many of my favourites – including the Bush TR130 and Roberts RT1 of 1958 – are there.

For the keen radio enthusiast (even though communications sets aren't covered) the author provides some interesting historical details on the manufacturers and the development of transistor techniques – in fact, transistorised receivers are well featured (they are often neglected in books of this type).

Also included in the book are hints of the necessary safety methods required for use with mains sets, valves, restoration and repairs (including loudspeakers and sources of spares for older receivers. There's also a selection of photographs showing a number of American and Canadian receivers and *PW* readers attending the huge Dayton Hamvention flea market in the USA could identify their bargain-buys. The section on European sets took me back to my school-days when we owned a (featured) Blaupunkt set.

Altogether, I think I'm going to get much pleasure from Tony Thompson's book. It's the type of book I can pick up, read for an hour or so and then pick it up again days later and discover something new! The author's work is superb and most enjoyable but I'm just a little worried that there's no mention of *PW* in the 'further reading' section at the end of the books, especially as many of our readers wil buy a copy! However, despite the omission I can thoroughly endorse *Collecting Vintage Radios* to *PW* readers. It's a truly engrossing book and many of the sets featured will take you back to our early days in the hobby! **Very Highly Recommended.**

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!

CHESTER
Chester & District Radio Society
Contact: Graham G7NEH
Tel: (07930) 655121
E-mail: info@chesterdars.org.uk
Website: www.chesterdars.org.uk

Members of the Chester & District Radio meet on a Tuesday evening at the Burley Memorial Hall, Common Lane, Waverton, Chester. All visitors will receive a warm welcome. Forthcoming meetings include September 18th: Project night - Build a Crystal Set by **Alan Hopkinson** and **25th**: International Short Wave League presentation by **Geoff Hoyles**.

NORTH
Hull & District ARS
Contact: Raymond Penny/K. Shaw
Tel: (01482) 504618/(01482) 217776
E-mail: sirraymond@sirraymond.karoo.co.uk or m3shw@yahoo.co.uk
Website: www.sydney.karoo.net.hardars

The Hull & District Amateur Radio Society meet every Friday at the Walton Street Leisure Centre, Walton Street, Anlaby Road, Hull HU3 6PA. The club are currently operating the Willberforce 200 year anniversary callsign GB200WW. They are also organising school and youth club visits in a bid to promote Amateur Radio. The club are also running Foundation, Intermediate and Advanced examination courses throughout the year.

NORTHERN IRELAND
Bangor & District ARS
Contact: Mike GI4XSF
Tel: 028-277 2383
Website: www.bdars.com

The Bangor and District Amateur Radio Society meet on the 1st Thursday of every month in The Boathouse, Harbour Car Park, Groomsport, at 2000hours. On **Thursday October 4th** the club are hosting a talk on the recent IRTS Swaziland DXpedition, by Pete GI4VIV. Please note the society's new venue, there is a map on the website for anyone who needs help in finding the boathouse. As always, visitors and new members are most welcome.

SHROPSHIRE
Telford & District ARS
Contact: Mike Street G3JKX
Tel: (01952) 299677
E-mail: mjstreetg3jkx@blueyonder.co.uk
Website: www.tdars.org

Members of the Telford & District Amateur Radio Society meet at 2000hours every Wednesday at the Community Centre, Bank Road, Dawley Bank, Telford, Shropshire TF4 2AZ. There is a Morse practice session at each meeting starting at 1930hours. Forthcoming events include **September 19th**: Hamfest Preparations; **28th**: How to make decent omlettes demo and eat by G0EYX – Bring your appetite! **October 3rd**: HF OTA and Open House plus committee meeting and **10th**: Hamfest debrief, feedback and ideas sharing.

Richard's Winning Morse Key

Richard Beck M3YLB was the winner of the recent Chelmsford Amateur Radio Society (CARS) annual constructors competition. As in previous contests, there were plenty of high quality entries.

Club members voted for the best entry in a secret ballot and Richard's design of a Morse key mounted on a solid slab of granite won. Richard said it was working the granite that was the hardest part, particularly channelling out the underside for the fixing posts.

Although he lives in Southend-on-Sea, the nearest Foundation course to Richard was the six week course in Danbury near Chelmsford, an hours' drive away. Fortunately, the distance didn't deter him and the course tutors were impressed by his enthusiasm, energy and desire to succeed.

Since obtaining his licence Richard has been active in encouraging others in Southend to take up Amateur Radio. He has helped with their many questions about the tuition material and even provided some of them with transport to get to Danbury.

Due to the considerable interest among Foundation Licence holders to learn Morse, CARS has started Morse classes under the leadership of **Andrew Kersey G0IBN**. Richard was the first to enrol on the course, which is just as well, as it was quickly oversubscribed!

The Chelmsford & District Amateur Radio Society are now taking names for their next Foundation course. For details contact the training organiser,
Clive G1EUC. Tel: (01245) 2245577/08760 418835. E-mail: training2007@g0mwt.org.uk Website: http://www.g0mwt.org.uk/training

Technical for the Terrified!

This month, Tony Nailer G4CFY looks into the background and techniques of voltage regulated power supplies.

Radio Amateurs and experimenters often need to regulate a d.c. supply, or even to build a bench supply. In T4T *PW* October 2005, I dealt with simple zener diode regulators, and also a zener feeding the base of an emitter follower. Then, in T4T August 2006 I dealt with diodes and rectification.

In this article, I will move on to regulators and regulation, which in most cases the regulation applied is to the voltage of the supply. On any power supply, there's a voltage drop on supplying current. We must sense the output voltage and use any slight change to counteract loading effects. The simplest application of this is to use the properties of operational amplifier (op amp), with its inverting and non-inverting inputs.

Inverting Amplifier

An op amp d.c. inverting amplifier is shown In **Fig. 1**, where I have shown all resistors equal to aid understanding its operation. The (+) or non-inverting input is fixed at 5V by means of a zener diode. With the In terminal unconnected the Out terminal will also sit at 5V.

Now, if a voltage of 4V is applied to the In terminal, the output will move positive until the junction of R1/R2, at the (-) or inverting input is still kept at exactly 5V. This will occur when the Out terminal is at 6V.

Conversely if the In terminal is raised to 6V, the Out terminal will drop to 4V to make the level at the (-) input 5V again. Clever isn't it? If R2 is increased in value to 20kΩ, the Out terminal will then move twice as far, and in the opposite direction to the In terminal. A change of 1V between the In terminal will produce a 2V change at the Out terminal. So, the gain of this set-up is defined as (R2/R1).

Non-inverting Amplifier

The circuit of **Fig. 2** shows a non-inverting d.c. amplifier. In this configuration the gain is (1 + R2/R1). With (+) input unconnected, the (-) input and Out point both sit at 5V. Now, if a voltage of 4V is applied to the In terminal, the output will drop to 3V.

The change in the output is twice the difference between the In terminal and the reference (5V). Likewise, if the In terminal goes to 6V, then the Out terminal will go to 7V.

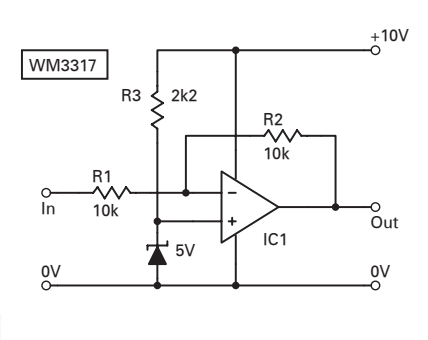


Fig. 1: In the inverting mode the Out terminal changes in the opposite direction to the variation between the In terminal and the zener voltage.

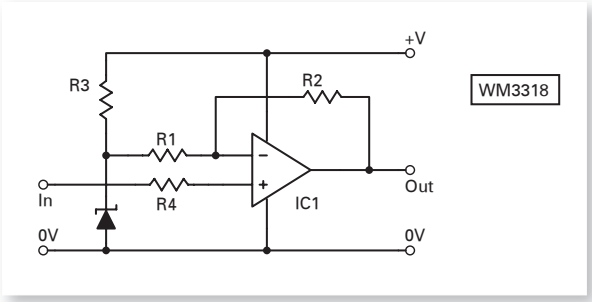


Fig. 2: In the non-inverting mode the Out terminal changes in the same direction as the variation between the In terminal and the zener voltage.

Inverting Regulator

Let's now look at an inverting regulator, as shown in **Fig. 3**. Shown here is a stabilised supply using an emitter follower and an op amp in a d.c. Inverting mode. The (+) input is again fixed by a zener. The output of the op amp will rise until the junction of R2/R1, (-) input, becomes equal to the zener voltage on the (+) input.

When the output, taken from the emitter of the series pass transistor Tr1, is loaded down, it will tend to fall and the junction of R2/R1 will also fall. This fall of the (-) input will make the output of the op amp rise and take the base of the transistor upwards. The emitter voltage follows the increase in the base voltage, which tends to correct the original voltage drop.

The consequence of the correction is that the voltage across R1 remains equal to the zener voltage Vz. Also the output voltage Vout is across R1+R2. The formula for the voltage relationship is Vout/Vz = (R1+R2)/R1.

It's usual to specify a zener diode voltage and from the required output voltage, it's possible to determine the resistor values needed. The formula can be simplified to (R2/R1) = (Vout/Vz)–1. There is one other proviso with this circuit, which is that there should be at least 3V between collector and emitter of the series pass transistor Tr1.

For example, using a d.c. input rail of 13.5V, and a required output of 9V, and the zener voltage is 5.1V. Then (R2/R1) = (9V/5.1) – 1 = 0.7647. This means R2 = (0.7647*R1). It is unlikely we will find two resistors with exactly that ratio. So the usual practice is to use two resistors and a trimmer potentiometer.

The values can be quite large as they are only feeding the input terminal of an op amp. If R1 is 10kΩ then R2 and the trimmer resistor need to make up 7.647kΩ. There are many solutions to this but one possible version is R1 = 8.2kΩ and R2 = 5.6kΩ + 1kΩ trimmer.

The base resistor R4 is in circuit to safeguard the transistor from having its base-emitter junction destroyed. The drive to Tr1 base also should not exceed the current source or sink capability of the op amp. A good maximum design value is 10mA.

Assume that you accidentally short the output terminal to ground. The op amp output will go to the positive rail. If the supply rail is 13.5V and the drop across the base emitter is 0.7V then R4 = (13.5 – 0.7)/10mA = 1280Ω. Use 1.2kΩ.

Resistor R3 is chosen for a nominal 5mA through the zener. With a 13.5V rail and a 5.1V zener, R3 = (13.5 – 5.1)/5mA = 1680Ω, for which we could use 1.5kΩ.

The pass transistor Tr1 could be expected to have a minimum d.c. gain

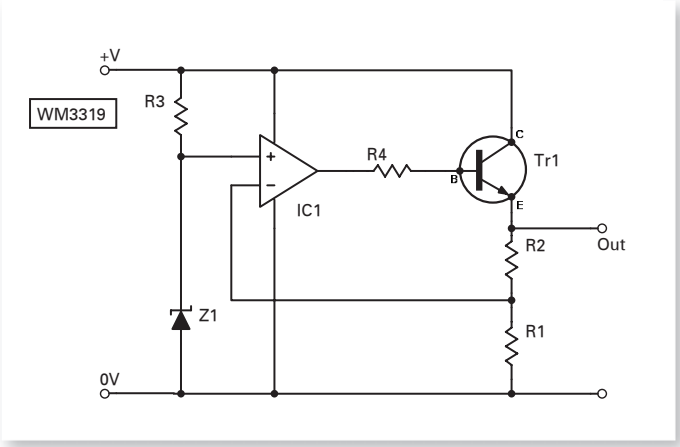


*Fig. 3: A regulator with its output voltage set to (R2/R1)*Vz.*

Tony Nailer G4CFY
To subscribe to my readers' list, send a blank e-mail to: **pw-g4cfy-on@pwpublishing.ltd.uk** with the word subscribe in the subject box. When you receive confirmation from the server you can then send e-mails to **pw-g4cfy@pwpublishing.ltd.uk** and your comments will be answered by myself or the *PW* team.

(β) of 20. This means with 10mA base current the transistor can source or sink 200mA. If the emitter voltage is say 9V, and the main supply 13.5V, then it will have to dissipate (13.5 – 9)*200mA = 0.9W. I would suggest using a BFY51 with a TO5 push-on crinkle heatsink for Tr1.

Non-inverting Regulator

Now it's time to look at **Fig. 4**, where the op amp is being used as a non-inverting d.c. amplifier. The transistor In this case is a *pnp* device. This regulator has the advantage that the output voltage can get as close to the main supply rail as the saturation of Tr1 will allow, which could be just 100mV.

For example, it would be possible to produce a 12V regulated supply from a 13.5V main rail. In this case, if the output falls, the positive input of the op amp falls, the output of the op amp falls even more and biases the base emitter junction of Tr1 more. The rise in base current of Tr1, in turn causes the collector of Tr1 to rise and counteract the original fall.

The calculation of all the resistors is the same as the inverting regulator. As this type of regulator is used where the difference between main rail and output rail is small, the dissipation of the pass transistor is much lower.

I use this circuit with a 5V1 zener and with R1 and R2 of equal value thereby producing an output voltage of 10.2V. With output currents up to 100mA I use a BF557 pnp device. For much greater dissipation I recommend using a TIP30, with a clip on heatsink if required.

Circuit Improvements

The op amp can change very fast to counteract changes of load, but it's not infinitely fast. The result is that loads, which exert fast changes, can cause the output to produce a saw tooth ripple where the op amp just cannot keep up.

Also the base-emitter junction voltage of the series pass transistor rises at higher emitter currents, this produces a voltage concertina effect, giving rise to a sinewave ripple. To overcome both these problems the output should be loaded (filtered) with capacitors that provide both low frequency and high frequency ripple rejection.

To filter both low and high frequencies, it's usual to use both electrolytic and simple capacitors, perhaps an electrolytic of few hundred microfarads and disc ceramic capacitors of a few hundred nanofarads.

The main supply rail itself may not be very constant. In a vehicle, the supply may vary from the 12V of a discharged battery to in excess of 14V when it is being heavily charged from an alternator. In this situation the current through the zener will vary, and so will its zener voltage. To overcome this problem resistor R3 can be replaced with a constant current source. This means that regardless of the main supply voltage, the current through the zener remains constant.

In the article Doing it By Design, *PW* January 2005, I dealt with characteristics of f.e.t.s. One feature of these devices is, that the drain current, Idss, stays constant for wide variations of drain to source voltage, when the gate-to-source voltage is zero.

This drain current characteristic of an f.e.t. is a bit temperature sensitive, but not enough at around ambient temperature to make it unusable. In the DiBD article, measurements revealed that a Phillips BF256a f.e.t. had an Idss that remains fairly constant in the region 5.8 to 6.3mA. This is ideal to feed a zener diode.

A final circuit of a negative feedback regulated 9V/200mA capable stabilised power supply is shown in **Fig. 5**. Circuits of this general layout have been produced as i.c. regulators such as the LM723, and the fixed voltage three terminal types such as 7805 and 7812 series.

With the information supplied In this article you should now understand the workings of regulator devices or even be able to make your own. ●

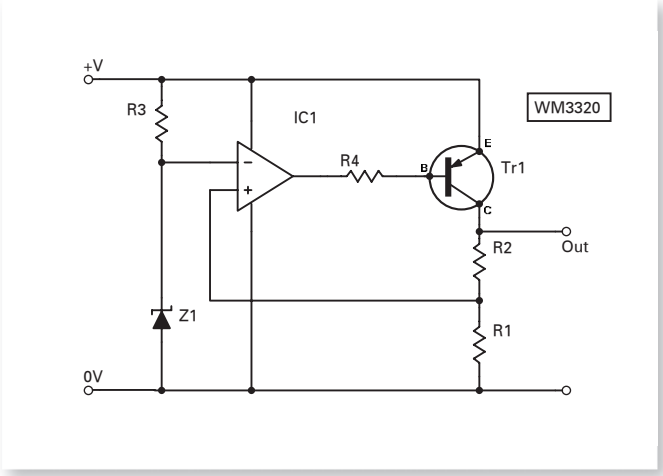


*Fig. 4: Using a pnp transistor as the series pass element with its output voltage set to (1+(R2/R1))*Vz.*

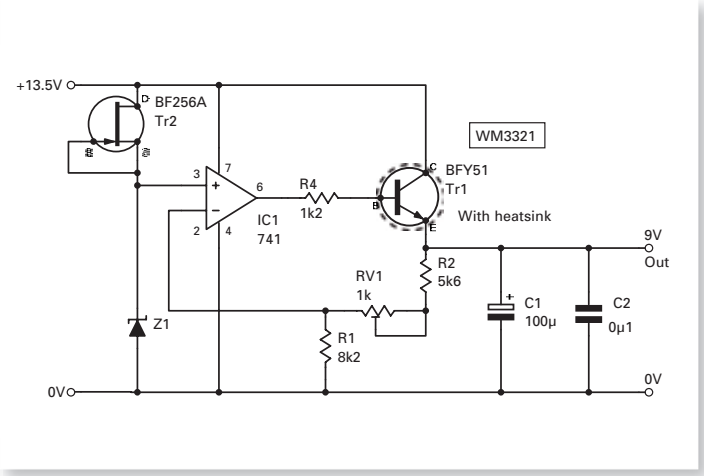
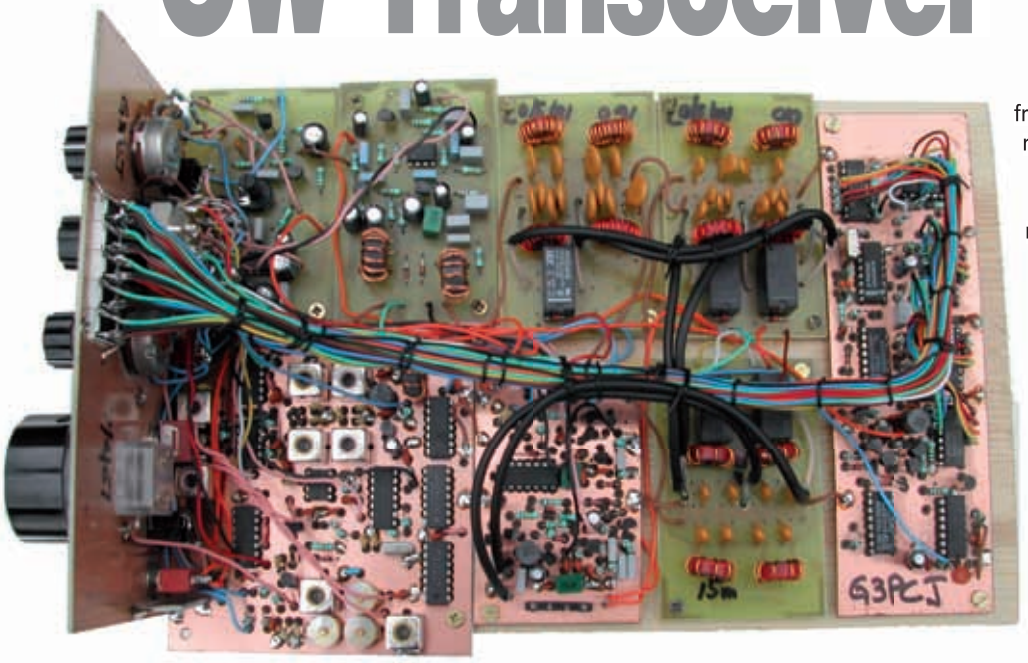


Fig. 5: The improved regulator allows the output voltage to be set more accurately, even with variation of the zener voltage from its nominal level.

Work the World with a low power c.w. transceiver!

The Upton CW Transceiver



Tim Walford G3PCJ introduces his latest design, which is aimed at providing an all-band, good performance QRP c.w. rig that you can build yourself. Low power c.w. working is great fun and you can achieve much with a relatively simple station.

The Upton is a project which I have nurtured for the best part of a year and at last I feel sufficiently confident to write about it! It's an all-band c.w. direct conversion (DC) transceiver using several standard kits, so it is quite complex, **Fig. 1**.

As some builders may not want either all the bands or all of the functions/kits that comprise my completed Upton, this article describes a concept from which readers can pick and choose as they wish. The heart of the rig is the All Band LO (ABLO) described in *PW* April 2007.

The other new elements are the Pylle 1.5W c.w. transmitter and the product detector kit (both described below). Other aspects use existing kit designs for low pass filters, audio amplifier and frequency counter.

As usual, kits are available – see the end panel for details – but bear in mind that you don't have to have all of those listed, so **please** explain carefully what you would like when ordering! Due to the many options, there's no single mechanical design and mounting/connecting the printed circuit boards (p.c.b.s) is up to you with advice given later!

The Design Concept

Let's now look at the design concept. Using the direct conversion (DC) receiver approach makes it is much easier to organise band changing in the local oscillator and the frequency offset, which is required to obtain a receiving beat note.

Apart from the obvious need for long term frequency stability, the local oscillator must also be immune to short term frequency pulling. This produces 'chirp' and is caused by transmitter radio frequency (r.f.) currents getting into the the local oscillator (l.o.) resonators.

The problems can be avoided by mixing the output of a variable frequency oscillator (v.f.o.) with suitable crystal derived frequencies and then filtering to select the wanted frequency. This is the approach of the ABLO, which uses a 4 to 5MHz v.f.o., mixed with either 3 or 24MHz from a crystal, to provide a nominal 7 or 28MHz, which is then divided down digitally for all the traditional harmonically related bands.

The fine tuning circuitry of the ABLO also doubles as the receiver incremental tuning (RIT) control. The ABLO drives both the transmitter and receiver sections as shown in the general block diagram in **Fig. 2**.

Broadband Pylle

The Pylle (like Upton, Pylle is a nearby village here in Somerset) c.w. transmitter (see below) is broadband, so it has to be followed by low-pass filters (l.p.f.) to remove unwanted harmonics. Each of my standard l.p.f. kits caters for two bands and the relays allow them to be connected together for many pairs of bands.

The highest frequency pair (21 and 28MHz) are connected nearest to the transmitter, with the filter for 1.8MHz furthest down the chain. The last p.c.b. mounted l.p.f. only uses one relay (fitted in a slightly different position) as there are no further filters in the chain.

The band switch of the ABLO controls the l.p.f. relays for each band. The r.f. output of the ABLO also drives the product detector (see later), which is the most critical part of the

receiver. This is followed by the standard audio amplifier, which has a gain control and output for a loudspeaker.

The design of the kit has been updated for receiver (RX) muting during transmission and for injecting receiving sidetone into the output stage. The normal shaft type pre-set audio gain control is best changed to a front panel 4.7kΩ logarithmic potentiometer, so that the pre-set can control the sidetone level instead.

Moving the audio frequency gain control to after the product detector (but before the first stage of the audio amplifier) kit will reduce the chance of overloading subsequent stages on very strong signals. Proper connection of the audio stages (to avoid unwanted ground loops) is essential (see later comments in this article).

Note: If a counter is to be fitted, this is also driven by the ABLO with a digital input direct to the 'up counting' A channel.

Adding a front panel supply switch for the counter, allows it to be turned off to conserve power, or kill any unwelcome noises (always a risk with wide coverage DC rigs).

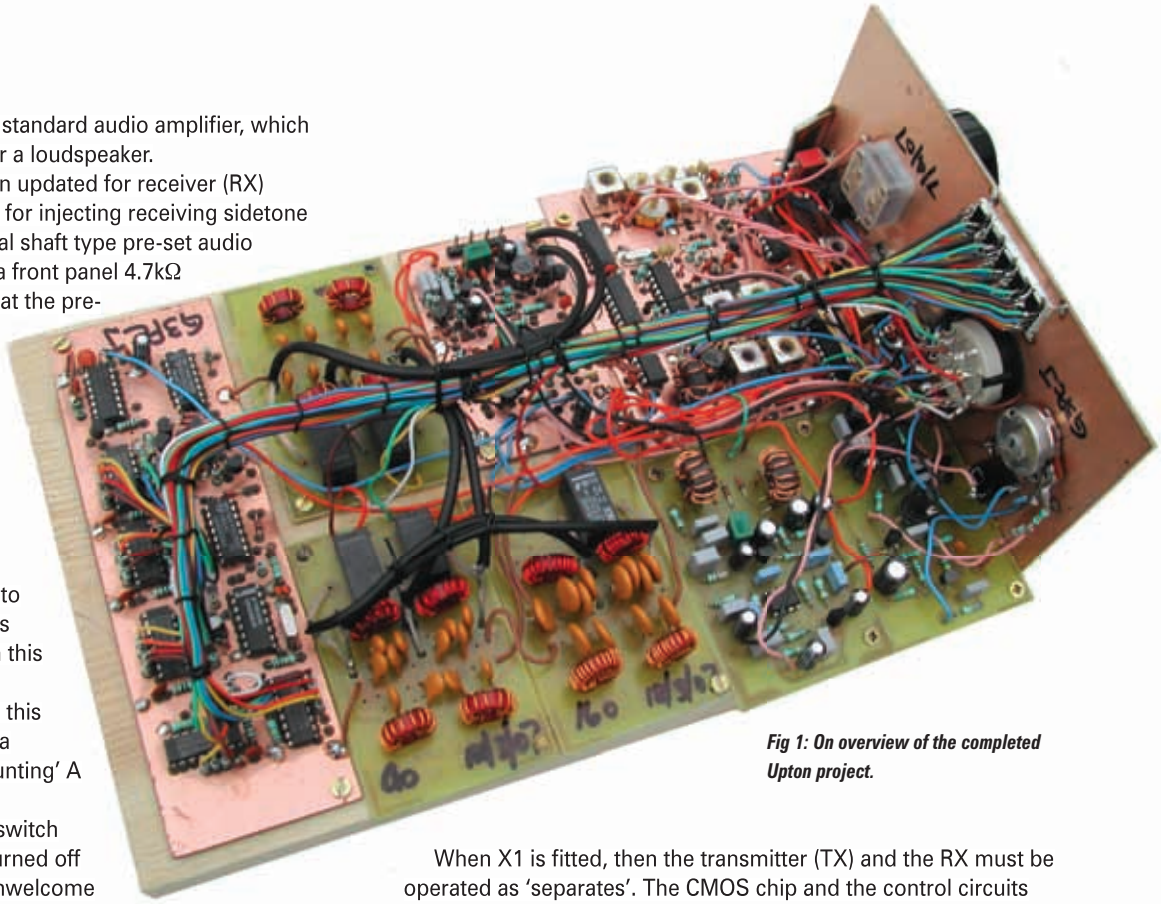


Fig 1: On overview of the completed Upton project.

The Pylle Transmitter

The diagram, **Fig. 3**, shows the Pylle circuit. Due to the 50Ω antenna load being connected direct to the output BS170 transistors, Tr2 and 3, the unit provides 1.5W of r.f. when used on nominal 12V supplies.

The standard relay selected l.p.f. (on their own p.c.b.s) remove unwanted harmonics. The output stage has digital drive (IC1c/d) using a quad CMOS NOR gate, with one section IC1b acting as either a buffer when driven from an external source connected to point O, such as the ABLO, or as an oscillator with its own crystal or ceramic resonator fitted at X1.

When X1 is fitted, then the transmitter (TX) and the RX must be operated as 'separates'. The CMOS chip and the control circuits use a 5V supply from the 78L05 regulator IC2. The transistor, Tr6 controls the transmit-receive (T-R) switching aspects; it's on during reception and turned off by closing the key.

The Morse keying action turns on both the RIT shorting transistor Tr4 (which removes any receiving offset set by the fine control of the ABLO), and the receiver muting transistor Tr5. The latter device has delayed turn off after key up (due to D2) to mask nasty transients that would otherwise cause severe audio thumps.

The normal time constant of R6/C10 gives full break-in T/R operation. However, it can be made semi-break in by increasing R6 to 1MΩ.

Closure of the key allows r.f. through IC1c/d to the output stage after a small delay caused by R11/C13 but with a much faster 'turn off' due to D4. As the transistor, Tr6, is also off, it allows point T to rise towards the supply voltage, which permits the sidetone oscillator Tr7 to run without the clamping action from D8/9/10.

The diodes, D9 and 10, are included to reduce the change in d.c. level, which would cause a nasty thump, as the sidetone oscillator (Tr7) start/stops. It's a twin T design set for nominal 750Hz. The output (from point S) is fed into the output stage of the audio amplifier.

Note: For use on amplitude modulation (a.m.), grounding the point P will put the Pylle into transmit without the sidetone!

The final action of Tr6 turning off (when the key is closed), is to make the gate on IC1a change state. The output here is normally 'high' at 5V during reception which provides both the d.c. bias to the broadband receiving r.f. amplifier Tr1. It also makes the T-R switch diode D1 conduct (through R4 and Tr6), so allowing antenna input signals to Tr1.

When the Morse key is closed, the

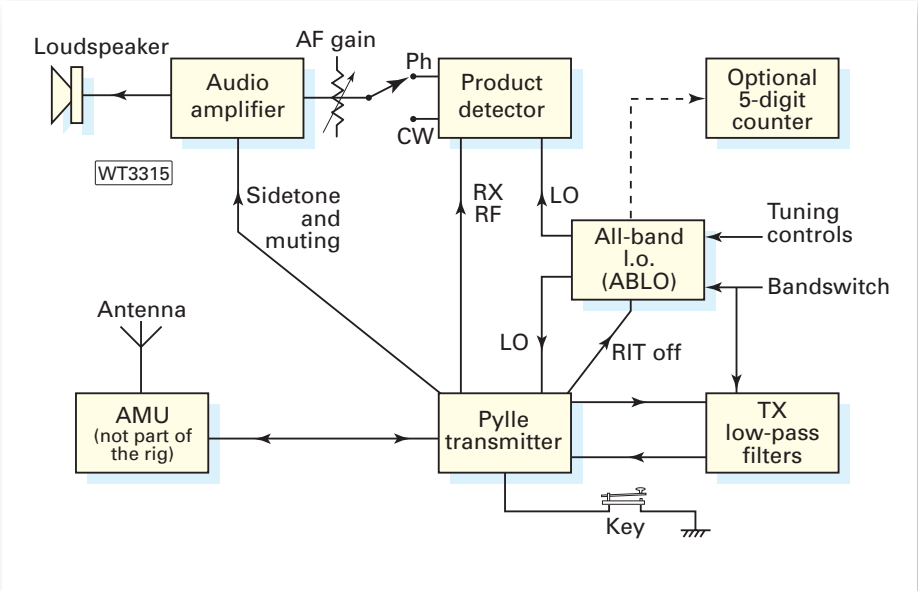


Fig 2. Block diagram of the Upton transceiver.

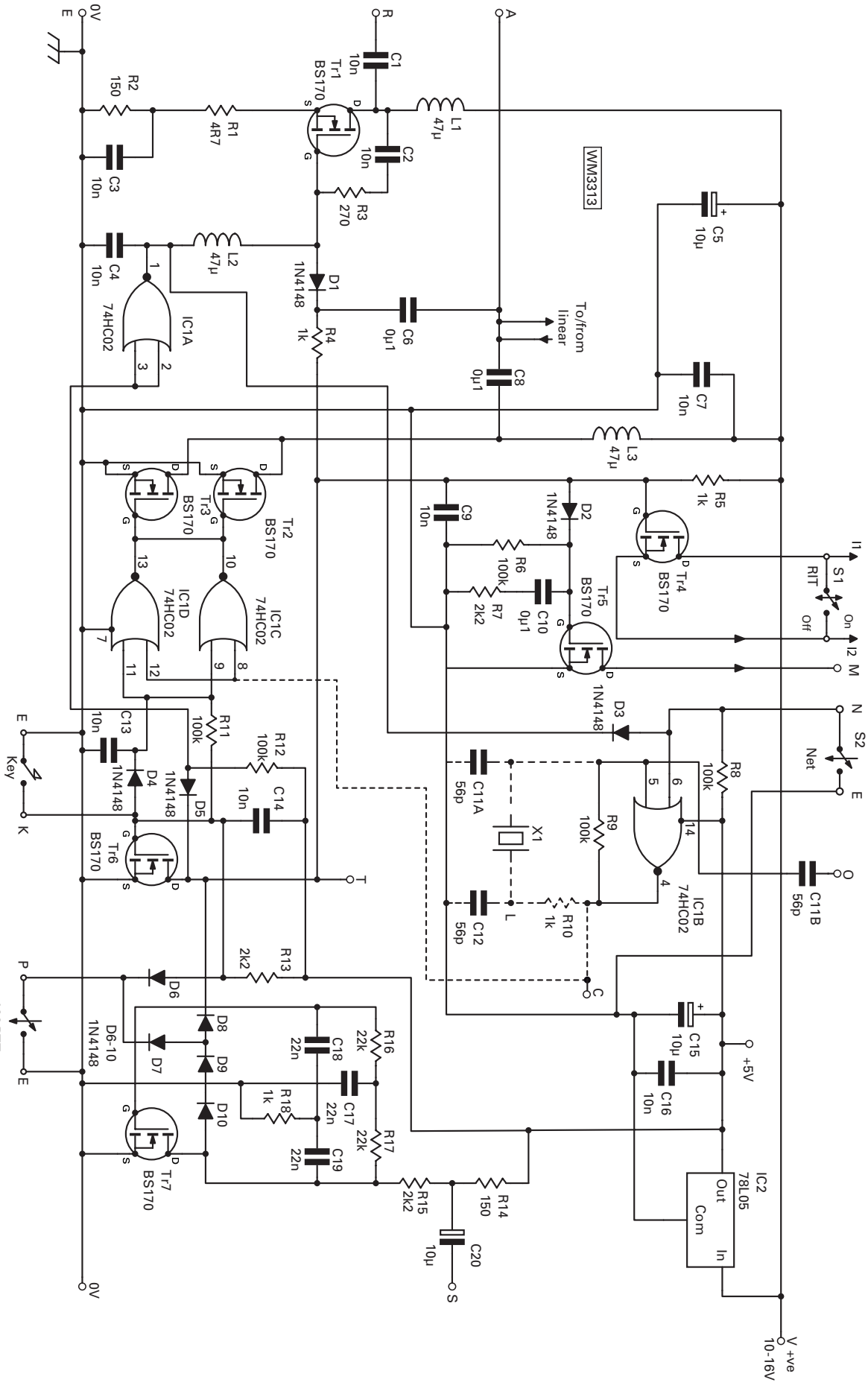


Fig 3. Circuit of the Pylle TX portion of the Upton.

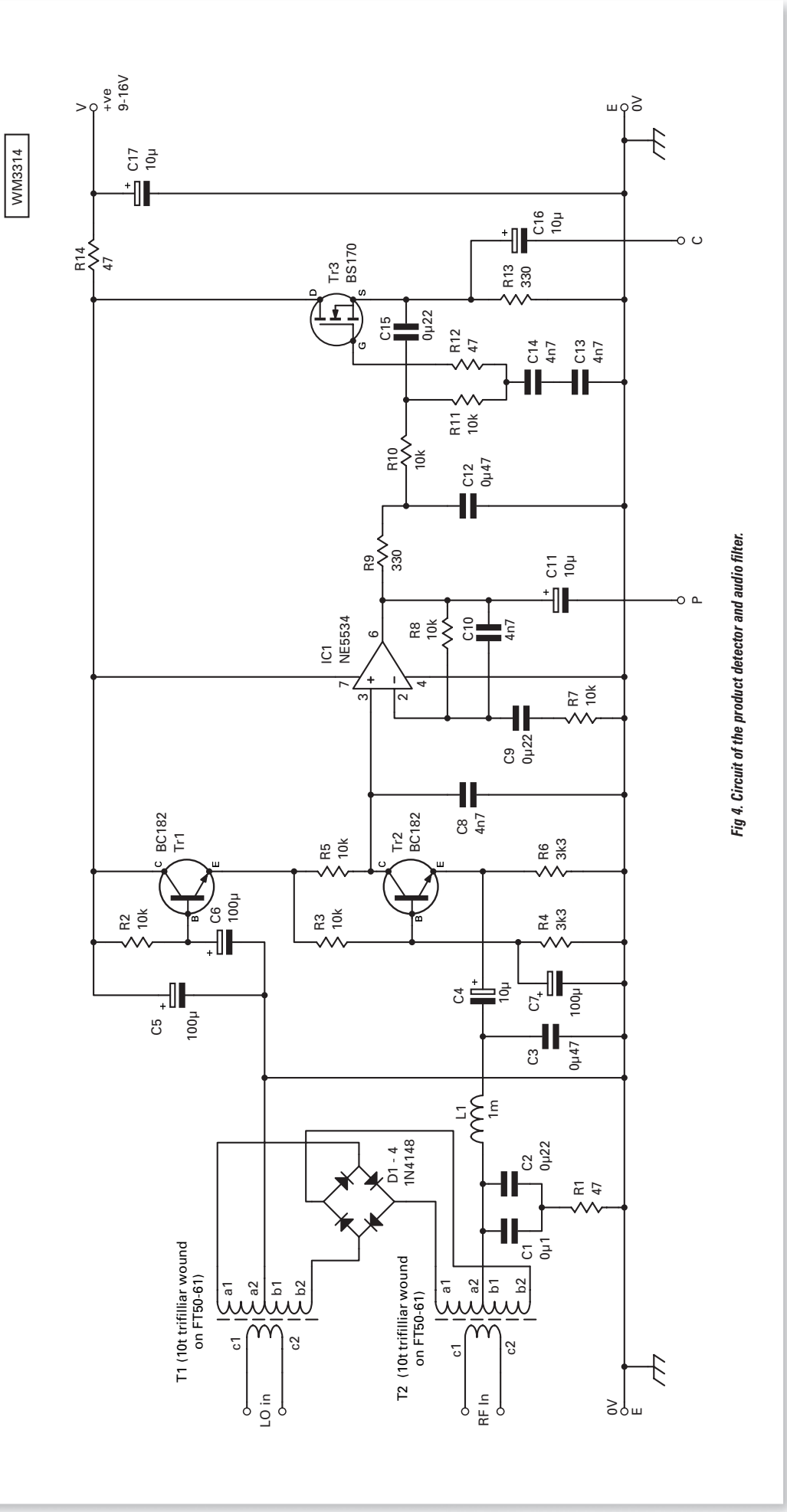


Fig 4. Circuit of the product detector and audio filter.

bias is removed and D1 becomes reverse biased and isolates the r.f. amplifier from the transmitter output. The resistor, R1, keeps the gain of Tr1 low (just enough) to compensate for the loss in D1, to maintain the overload margin of the following RX stages connected to point R.

My standard linear amplifier kit can be connected at point L to increase the r.f. output to 10W. Although it's most effective on 14MHz and the lower bands, it will also help on 21 and 28MHz.

Building the Pylle is quite straight forward but a little care is needed over the clutch of diodes between Tr6 and 7! The usual advice of building and then testing in sections applies. I advise that you start with the supply aspects, followed by the T/R control stage Tr6, and then following the flow of signals through each of the other sections.

The Product Detector

The product detector function of a DC receiver has a marked impact on its overall performance. Avoiding broadcasting interference (BCI) problems on 7MHz is challenging in any design but I also wanted to avoid band-pass RX filters for each band if I could! The meant a 'strong' mixer (high overload margin) was essential.

Experiments with quad diode mixers showed good promise provided they were properly terminated on all ports. So, I was hoping that the selectivity provided by a good station antenna matching unit (a.m.u.) and the TX l.p.f.s would be adequate! I'm pleased to say that with the precautions mentioned, the level of occasional BCI that I have suffer from is

very low - even when using a large 1.8MHz dipole antenna!

The resulting design for the product detector kit is shown in **Fig. 4**. The mixer diodes D1 – 4 and the associated transformers T1/2 are conventional but they are followed by a diplexer. This terminates the output port over a very wide bandwidth while allowing only signals below about 5kHz through L1 into the following grounded base low noise audio amplifier Tr2.

A grounded base amplifier is used because the easily controlled low impedance at its emitter provides a good match to the mixer and diplexer. With such low signals (at the microvolts levels) there has to be very good supply filtering and decoupling – provided by R2/C6/Tr1 and R3/C7.

The capacitor, C8, provides a second stage of audio filtering with yet more in the following low noise NE5534 op-amp IC1.

The selectivity of a DC receiver is defined by the bandwidth of its audio stages. In this design it's limited to 3kHz in the early stages so that it can be used for 'phone or c.w. For serious c.w. use, the next stage is a third order low pass filter which attenuates signals sharply over 750Hz. The first section R9/C12 adds to the high frequency roll off and also removes the slight peak in the response of the main humped low pass section around Tr3 (R10/11/C13/14/15).

The low impedance outputs for 'phone from point P, or from C for c.w., are selected by a toggle switch feeding the 4.7kΩ logarithmic audio gain potentiometer. In practice, the product detector is an easily constructed single-sided p.c.b., which should be mounted close to the following audio amplifier (see later comments regarding its connections).

Connecting The Boards

The main point to note is that a.f. and r.f. aspects of the project need different 'earthing' arrangements. In this, I don't mean their connection to the real world outside the window, instead I'm referring to the manner in which the 0V or ground planes of the different kits are connected together.

The a.f. aspects require 'single point' earthing to avoid unplanned signal loops. These which might lead to some of the output stage audio current getting back into the low level circuits and causing howling or screeching.

The r.f. aspects need lots of low inductance connection provided by as many interconnections as possible!

Mechanically, I decided to use a wooden plank onto which I could screw a front p.c.b. panel and all the individual p.c.b.s. This is good for demonstrations but a metal case might be better – ideally of the sort where you can remove any side without the whole thing falling to pieces! The pattern of connections suggests that the ABLO, Pylle and Product Detector should be in the middle, with the audio amplifier on one side and the l.p.f.s on the other.

Solidly Connected

The main a.f. amplifier should be **solidly connected** to the supplies, with a direct connection from the negative line to the loudspeaker socket 'earth' wire. The audio gain potentiometer **must not** share this earth connection but must instead be connected direct to the 0V track of the main audio amplifier near its input stage.

The product detector board should have a single 0V wire linking it to the main audio amplifier 0V track, again near its input stage. The two signal outputs of the product detector go to the 'phone/c.w. filter switch and from there to the audio gain potentiometer and then to the first stage of the a.f. amplifier kit.

The Pylle includes space for a RX muting transistor Tr5 but it's better moved to the alternative position on the a.f. amplifier board. The 'linking' wire is then in the gate lead of Tr5 instead of its drain.

Even with all of the precautions I've discussed, there may be a tendency to audio screeching or howling (at high a.f. gain settings) on 'phone due to the very high overall audio gain. If your project suffers these problems, a little extra audio attenuation should cure it – try a 3.3kΩ/1kΩ attenuator between the main audio pre-amplifier and output stage. This will still leave the rig with as much sensitivity as is usually needed and if the band's cosmic noise can be heard when you plug in your antenna, there's no need for higher rig sensitivity!

The arrangement of the positive supply line is less critical – it has plenty of decoupling but it's prudent to anchor the line in several places around the rig with extra 10nF ceramic disc decoupling capacitors. The incoming positive supply should directly feed the Pylle and audio amplifier kits as these draw the highest currents.

Intentionally Isolated

The product detector ground connections of the l.o. and r.f. signals to their toroids are intentionally isolated from their 0V to avoid audio loops. Consequently these two r.f. connections must have their inputs in twisted pair wire (or 50Ω coaxial cable) back to their sources in the ABLO and Pylle respectively. This leaves the product detector with a single ground or 0V connection to the main a.f. amplifier board – so avoiding any loop.

The r.f. connection between the ABLO and Pylle can be coaxial cable or a twisted pair of wires. The connections between Pylle and l.p.f. board and between l.p.f.s, should all be made with miniature 50Ω coaxial cable, with the screens connected at both ends for all links.

Initially, I had made the l.p.f. connections with single short wires (and plenty of grounding links!) but changing to 50Ω coaxial cable doubled the 28MHz output to 1W! The wiring maybe a bit tricky but its worth doing! (You can see the black coaxial cable leads in the photographs).

I realise this is quite a challenging project and many builders will wish to use whatever 'sections' of rigs that they already have. No problem - that's absolutely fine, and to be encouraged, but it means that there cannot be one single definitive design for the Upton – its largely up to you how you mount the various parts and then connect them together!

I wish you the best of luck because it very satisfying when it all comes together with a successful rig!

Tim Walford G3PCJ

Kits & Bits

Kits for the Upton project are available from Walford Electronics. When ordering, please explain what kits and bands are needed from following list.

Prices are:-	
ABLO	£49
Pylle CW TX	£24
RF Linear amp	£24
Dual LPF – two bands per kit	£19
Product Detector	£19
Audio amplifier kit	£14
Five digit counter kit	£45
Upton 'extras' – audio frequency gain control potentiometer, 2 toggle switches, LS socket, SS PCB	£6

P & P is £3 per order.

Please send your orders with a cheque direct to **Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ.** Further information is available at **www.users.globalnet.co.uk/~walfor**

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palstar
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WonderWand mk11 40-6m HF portable antenna

Why WonderWand?

After distributing its nearest competitor for many years we thought we should check out the WonderWand. We liked the fact that it could handle more power (actually, double), the tuning knob is placed on the correct side of the unit, allowing it to be used with all HF transceivers, the additional plug-in TCP tunable counterpoise makes obvious sense, (it's competitor hasn't the facility) the case doesn't crack where the whip protudes as the WW is made of strong durable plastic, it's better value at £10 less and finally it's BRITISH BUILT. That alone should finalise your descision.

The Wonder Wand is a 40m to 6m (7MHz - 50MHz) portable unit with a rotatable knob on the rear which allows you to select the desired band of operation. The Wonder Wand also allows VHF & UHF (70MHz to 440MHz) operation via the VHF/UHF section on the rotatable knob which is ideal for the Yaesu FT-817, Icom IC-703 and many others.

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Cobra 10,12,15,17,20. All 90cm long, all 500W RTTY/AM..... ~~All £119.95~~ each
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HF/6m All Mode Base Transceiver

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kenwood

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Price - CALL!

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v.h.f/u.h.f. mobile transceiver

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Just superb on all bands 160m-70cm with optional 23cm (X-Version)
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As above but with 23cm fitted. **RRP: £1999 ML&S: £1699**

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First rig with BLUE TOOTH!

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Only £699.95 for both
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VERY LIMITED OFFER!

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High Power version of he FT-817. Use as a transportable, (20W) or as a base/mobile (100W)

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FT-897D 'Vanilla' Basic FT-897 HF-70cm Transportable.
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- Variable RF Tuning & Roofing Filters as standard

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Full 100 Watts, DSP, Optional internal ATU & measuring only 9"x3.3"x8.5"

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For more details see: www.FT-450.com

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LINEAR AMP Ranger 811

The Ranger 811H uses four vertically-mounted 811A valves to produce 800W on the Amateur HF bands. As with all our models, the Ranger has a toroidal transformer providing the power into a voltage doubler board. The voltage doubler is used in preference to a bridge rectifier as it keeps the AC volts down.

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High power version. With 200W and 200 memory channels.

- Tunable frequency: 1.8 - 30 Mhz with long wire antenna from 8 meters
- Input impendence: 50 ohms
- Input power: 10 - 200W PEP
- SWR: <2:1
- Power supply voltage: 12V +/- 10%
- Current consumption: <0.8A
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- 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

LDG

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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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The Yaesu FT-450

HF/50MHz Transceiver

The ability to produce a 1.8 – 28MHz and 50MHz 100W transceiver in a small box is aptly demonstrated by the Yaesu FT-450. It's no heavyweight and would make an ideal transceiver for a holiday or DXpedition.

The only addition would be a 12V power supply capable of 25A, that would increase the overall weight. But when you see the specifications of the FT-450, it really is quite amazing how it all fits into a space that is 229 x 84 x 217mm and weighs no more than 4kg!

The power cable is bulky and the in-line fuses are close to the power supply connections so, cannot be hidden, unless you hide the power supply! However, perhaps that's the idea, as there's plenty of cable. The items would all fit into a padded carrying bag, with, possibly, a wire antenna as well for a trip to an exotic location!

I feel that the FT-450 is not the ideal rig for the home station, especially as the knobs and buttons are getting even smaller. The shape is ergonomically good but for a main station I prefer a much larger transceiver with a tuning knob that's about twice the size as provided on this rig (just a personal choice, for ease of tuning).

The supplied microphone is also larger than the normal and has that new J connector (I think it's horrible). Microphones with the extra controls, up/down, fast tuning, come as optional extras. In the list of the optional extras there's a carrying handle, which struck me as strange!

Looking at the price, the FT-450 is quite a reasonable choice for somebody starting in the hobby and even better if you live in the USA! New in the USA, the FT-450 is under US$1000. Regardless of the value of Sterling against the Dollar, we still seem to pay the same in pounds as USA based Amateurs pay in Dollars!

Solidly Constructed

The FT-450 can be compared to my FT-1000MP in size from the photograph in **Fig 1**. The '450 is solidly constructed in a die-cast aluminium chassis, is well laid-out and clean, without untidy internal cables and wiring. This compact transceiver has a new design to attain that useful and much-sought-after 'simplicity of operation'.

The transceiver has all the important functions easily accessible, in contrast to the multiple controls of previous models. The speaker is mounted on the top cover, so beware of that if you take the cover off! However, it does unplug, so the cover can be put on one side.

Interestingly enough, the transceiver incorporates technology derived from the recent FT-2000 (I own one of these). As can be seen from the photographs, **Fig 2** and **3**, the power amplifier (p.a.) uses two Mitsubishi RD100HHF1 m.o.s.f.e.t.s operating in the push-pull mode.

The p.a. unit is built up on one printed circuit board (p.c.b.), which also comprises the transmit low-pass filters (l.p.f.) with their band-switching relays. The p.a. is similar to that employed in the FT-2000 and provides 100W output on all bands.

The receiver is a dual conversion superhet with the first intermediate frequency (i.f.) at 67.899MHz. Here, the 67.899MHz four-pole roofing filter and eight band-pass filters at the radio frequency (r.f.) stage provide excellent suppression of out-of-band interference.

The first i.f. signal, on leaving the roofing filter, passes via the 3SK151 first i.f. amplifier to an image-rejecting second mixer, which down converts it to 24kHz in one step. The 24kHz i.f. drives the digital signal processing (DSP). This unit is an ADI Blackfin Type ADSP – BF531SBST and like most modern transceivers nowadays, the emphasis is heavily on DSP.

The FT-450's backlit liquid crystal display (l.c.d.) shows all data and graphical indications required for effective operator control of the radio. The generously-sized screen also features a chart (in block diagram format) showing which controls and features are activated, including adjustment of the digital (DSP) i.f. filter.

As in the FT-2000, bar-graph displays are provided on the FT-450 for the **Contour**, **Notch**, **DNR** (noise reduction), **Width** and **Shift** controls, and metering for power output, ALC and s.w.r. metering indications. All the controls are simple (as compared to the 9000 and 2000 series). In fact, this transceiver

Roger Cooke G3LDI enjoys using Yaesu equipment and has much experience with his own FT-1000MP. Here, he looks at a newly introduced transceiver from the same stables.

has only five knobs, including the main variable frequency oscillator (v.f.o.) dial. This helps to de-clutter the front panel and aim for optimum ergonomic efficiency.

Among other features, a dedicated port is provided for the digital modes, using a 6-pin DIN. It has an 8-pin DIN for connecting to an external a.t.u., a 10-pin DIN for connecting to the optional VL-1000 linear amplifier and a DB-9 RS-232 connector for computer control.

The ATU-450 automatic antenna tuner (a.t.u.), covering all bands 1.8 to 50MHz (160 to 6m), is located in the underside of the chassis. It's an optional extra on the FT-450 and factory-fitted on the FT-450AT version and **Fig. 4** shows the (relatively simple) simple rear panel.

On The Air

At home, I operate on the air most days and join the Ex-G net on 14MHz, so I replaced my FT-1000MP with the FT-450 review rig and called in as usual. No comments were passed until I asked for a comment on my transmission. The general consensus of opinion was that the audio was not good. This was also the consensus when I tested it with some local stations on 3.5MHz.

In fact, most reports were quite critical of the audio, even when using the tailoring. I was using the MH-67 fist microphone supplied with the transceiver. These are fine for frequency modulation (f.m.) use and obviously are cheap to supply but I think a decent microphone would prevent criticism of the actual transceiver itself.

Personally, I would use a Heil headset with microphone insert. However, it's not easy to change microphones because of the J plug connector and I shall obviously have to construct an adaptor! I think it would be a good idea not to supply a microphone in the first place but put more into the actual audio tailoring so that a good quality microphone could then be acquired enabling an excellent audio signal to be heard.

The tuning knob I have already commented on and the FT-450 would have been easier to tune with a larger version. (This would enable more comfortable fine 'digit' tuning). While considering the main knob tuning, as we use them together, it's also worth mentioning the main display. Looking at a grey-scale TFT-LCD (thin film transistor liquid crystal display) when I already have a colour display on the FT-1000MP, it's obviously different but then again that on the FT-450 is quite adequate in what's shown. It's perhaps not a good idea to compare it to the FT-1000/2000 anyway but as I own an FT-1000 and and 2000 its difficult not to! That said, the overall performance of the FT-450 is very good on all modes.

Using The CW Mode

I then tried the transceiver on the c.w. mode, having wired a temporary plug for the keying jack, as the FT-450's was different to mine. I just tested it first before connecting it to my paddle, holding two pieces of wire, in a straight key mode, (if you could call it that!).

I then sent "test de G3LDI" at a wobbly 15w.p.m. on 14MHz and **W5ZR** called me! How embarrassing, I then had to conduct a QSO holding two pieces of wire! However, it was sufficient to illicit a report on the actual keying. I was happy with the side-tone and W5ZR was happy with the note and keying (the transceiver, not mine!) at the other end.

Sensitivity on the FT-450 is good and there is a pre-amplifier that can be switched in and out and this may be used in tandem with a 20dB attenuator. This produces four situations, which can be useful, especially on the lower bands.

The roofing filter, in conjunction with the DSP i.f. provides some interesting selectivity possibilities. It's just a matter of using the DSP/SEL button together with the shift and width controls to set the pass-band and the peak and null just where you want them

Product	Yaesu FT-450 h.f. and 50MHz transceiver
Company	Yaesu UK
Contact	Sales on **(01962) 866667.**
Pros & Cons	
Pros	The rig is solidly constructed and has a new compact design to achieve simplicity of operation – using only five knobs – and the DSP offers interesting selectivity possibilities. I think Yaesu have a winner here and the price isn't bad either!
Cons	No carrying handle (required for portable work) and supplied microphone not to my liking.
Price	£639.99 (£739.99 with a.a.t.u.)
Supplier	My thanks go to **Yaesu UK Ltd. Unit 12, Sun Valley Business Park, Winnal Close, Winchester, Hampshire SO23 0LB. Tel: (01962) 866667. FAX:(01962) 856801, E-mail: sales@yaesu.co.uk Website: www.yaesu.co.uk**

Fig. 1: Roger Cooke G3LDI enjoys using Yaseu equipment and the FT-450 for evaluation joined his FT-1000MP in the shack.

for the mode in use. Using the system does take a bit of practice but it will pay dividends for a new operator to sit and play with the transceiver in conjunction with the handbook for quite some time, becoming familiar with the controls and what can be obtained.

The notch filter and Digital Noise Reduction (DNR) system both help to enhance the s.s.b reception. The DNR system uses 11 different noise-reduction algorithms. Each of these is selectable and each can deal with different noise profiles. Bargraphs give a graphic display of all these selections and of the DSP settings. Metering functions are also bargraphs; Power Out, ALC and SWR are selectable from the Meter/Dim button. Power can be set to any level from 5 up to 100W.

All the normal functions on the transceiver can be set from the extensive menu system, including the DSP microphone equaliser. Once you have mastered the sequence of button pushing, it is fairly straightforward. However, as usual with new transceivers these days, reading the manual is the first mandatory exercise!

Using s.s.b., the audio can be tailored and there is a selection of ten available DSP equalisation settings. The gain can also be adjusted. The transmitted audio can be monitored using the monitor feature, enabling the user to hear any changes in audio tailoring. For DX chasing the flexible split operation, using the VFO-A and VFO-B frequency registers makes life easy. It is also possible to run different bands and modes in each register. Another audio feature is the voice recording, two memories of ten seconds each.

On c.w., it's possible to use a straight key or set up for using

the in-built electronic keyer, which has programmable parameters, speed, weighting, mark/space ratio, pitch, side tone and so on. There is also a programmable c.w. trainer and a beacon feature. However, I would have preferred to see the c.w. jack socket on the rear apron instead of the front panel. It would have been nice to see some c.w. envelope shaping in the menu too. I then tested the c.w. mode with several locals, all of whom said the keying was adequate.

Operation using RTTY is possible using FSK via the data socket on the rear apron. Various shifts are available from the menu. Other data modes, including packet, can be used via the Data socket too. For RTTY it would be advisable to reduce the power as with any of 100% duty cycle modes.

The FT-450 contains 500 regular memories, two **Home** channels – one on h.f. and the other on 50MHz – two special programmed limit memory pairs, one quick memory, and five 5MHz band channels. Memories within the 500 can be organised into ten groups for easy identification, including labelling. There is also a comprehensive memory and v.f.o. scanning system, again all are programmable from the menu.

Other features include display settings, beeper adjustments, automatic power off after non-use for a definable period, and a voice announcement of frequency. Of the optional extras available, I think I would pay a few pounds more for a carrying handle.

I used the transceiver on 50MHz, a band that I don't have equipment for – although I do have an antenna – and it just happened to show signs of activity. I managed four countries, 9A, I, IT9 and T7, all on s.s.b.

I think Yaesu have a winner here, with the few exceptions I have mentioned. It is well designed and thought out, well built and ideal as I have said for portable use, holiday locations and mobile. The price at £639.99 (£739.99 with a.a.t.u.) is not bad either! My thanks to Yaesu for the loan of the transceiver for review. ●

Figs. 2 and 3: Internal views of the FT-40 circuitry, including power amplifier stage.

Fig. 4: The (relatively) simple rear panel.

Manufacturer's Specifications

Obviously the figures quoted are not checked, as *PW* authors have no access to the test equipment (calibrated to the necessary legal standards) to qualify or substantiate these in any way. This review, as usual, is an experienced user evaluation. **Editor**.

General FT-450 Specifications

Frequency Range: Receive:	30kHz – 56MHz
Transmit:	1.8 to 50MHz
Emission Modes:	A1 (c.w.), A3 (a.m.), A3J (l.s.b./u.s.b), F3 (f.m.)
Synthesiser Steps (Min.):	10Hz (c.w./s.s.b.), 100Hz (a.m./f.m)
Antenna Impedance:	50Ω, Unbalanced
Operating Temp. Range:	-10 °C to +50 °C
Frequency Stability:	± 4p.p.m. from 1 min. to 60 min after power on. @25 °C: 1 ppm/hour
Supply Voltage:	Normal: 13.8V d.c. ±10%, Negative Ground
Current Consumption:	
Squelched:	1A (Approx.)
Receive:	1.5A
Transmit:	22A
Case Size:	229 (W) x 84 (H) x 217 (D)mm
Weight (Approx.):	3.6kg

Transmitter

Radio freq. power output:	100W @13.8V d.c.
Modulation Types:	Balanced modulator (s.s.b.). Early stage (Low Level) on a.m and variable reactance (f.m.)
Maximum deviation (f.m.):	±5kHz (FM-N: ±2.5kHz)
Spurious radiation:	–50 dB (1.8-29.7MHz) -70 dB (50MHz)
Carrier suppression:	>40dB
Opp. sideband Suppression:	>50dB
Frequency response (s.s.b.):	400Hz to 2600Hz (-6 dB)
Microphone impedance:	200 to 10kΩ (Nominal: 600Ω)

Receiver

Circuit Type:	Double conversion superheterodyne
Intermediate frequencies:	First: 67.899MHz, second 24 kHz
Sensitivity: (c.w./s.s.b., and a.m./ f.m.)	1.8 - 28MHz 0.2μV (c.w./s.s.b) 2μV (a.m./f.m.) - 28 - 30MHz 0.2μV and 0.5μV 50 - 56MHz 0.16μV, 1μV and 0.25μV
(s.s.b./c.w./a.m. = 10 B S/N, FM = 12dB SINAD)	
Image rejection:	70dB
Intermediate freq. rejection:	60dB
Selectivity (-6/-60 dB): s.s.b./c.w:	2.2 kHz/4.5kHz
a.m.:	6 kHz/20kHz
f.m.-N:	9 kHz/25kHz
c.w.-N:	500Hz/2kHz
Audio output:	2.2W (at 4Ω, 10% THD or less)
Audio output impedance:	4-16Ω

Available Options

YH-77STA Stereo Headphone	FP-1030A DC Power Supply
MH-31A8J Microphone	MHG-1 Carrying Handle
MD-200A8X Microphone	ATU-450 Antenna Auto Tuner
MLS-100 External Speaker	MMB-90 Mobile mounting
SP-2000 External Speaker	bracket

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- Input power: 10 - 200W PEP
- SWR: <2:1 • PSU: 12V +/- 10%
- Auto tuning time: Approx. 2 sec (1st tune).>1 sec to memory
- 200 Memorys • Weight: 1.8 KG, Size: 310 x 240 x 72mm(LWH)
- Remote switch optional **£29.99**

CG-3000 shown with optional remote switch.

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MFJ
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MFJ-941e HF 300 watts ATU @ **£109.99**
MFJ-949e HF 300 watts ATU + Dummy load @ **£139.99**
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In the Shop with Harry Leeming G3LLL

Harry G3LLL explains what the 'Sorta Balun' is as well as looking at the many variants in the Yaesu FT-101ZD series of rigs.

The FT-101ZD series was available in many different versions.

Most antenna tuning units (a.t.u.s) are unbalanced and have only a coaxial output. Feeding a length of 300Ω ribbon by fitting a conventional balun can cause problems as I explained last month. This is where **Frank Ogden G4JST**'s, 'Sorta Balun' comes in. Basically, it consists of a coil of coaxial cable, used to form a choke.

As shown in **Fig. 1**, the technique chokes-off r.f., which would otherwise flow down the outside of the coaxial cable and also prevents the earthed antenna tuning unit (a.t.u.) unbalancing the antenna by pulling one side of the feeder down to ground. This arrangement is cheap and avoids placing a large electrical stress on a conventional balun, by operating it at a high standing wave ratio (s.w.r.).

Commercial versions of the arrangement described above can be obtained; they are known as choke baluns and in place of the series inductance formed by a coil of coaxial cable, they incorporate ferrite cores. They work just as well but you have to pay for them!

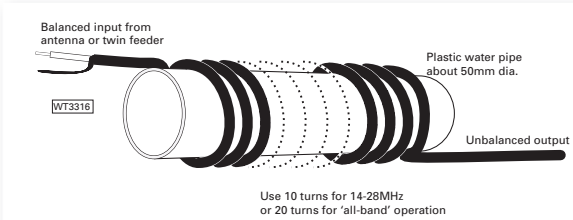

Fig. 1: Frank Ogden G4JST's design for a 'Sorta Balun'.

Which Rig Is Which? – The FT-101 Series

When the Yaesu FT-101E was due for replacement, a few FT-101Fs were made. I've never seen one of these, as they only seem to have been released in the USA but as far as I can gather these were a re-badged version of the latest FT-101E. The real replacement for the whole FT-101 series was the FT-101ZD.

The FT-101ZD is basically an economy version of the FT-901, which I talked about last month. While the power level is still just over 100W output, a slightly lighter mains transformer is fitted. Originally, there was also no memory, peak or notch filter, automatic keyer, a.m. or f.m.

The number of plug-in circuit panels was reduced, and a large portion of the circuitry was built on a large intermediate frequency (i.f.) panel. The radio frequency (r.f.) performance was, however, very similar to the FT-901 and it was an instant success.

Over the next few years, Yaesu gradually incorporated improvements and with each consignment, I can well remember wondering, "What have they done this time?" The model number never changed but to try and keep tabs unofficial suffixes were added by the late **Milton Lowens**, who ran the International Fox Tango Club. (The current reformed FT Club is at **http://foxtango.org/foxtango001.htm**)

The FT-101ZD MkI came out in 1978 and didn't include a.m. or the new 10, 18 and 24MHz bands. The FT-101ZD MkII came along a little later, with an a.m. position added to the mode switch. Whether one of these units actually included an a.m. board or offered it is an optional extra, depended on how it was ordered. So, don't presume that it's included if you purchase a second-hand unit. The a.m. reception is received via the s.s.b. filter and so while the transmit quality is okay, the received a.m. audio is a little muffled on these units.

The FT-101ZD MkIIA is quite desirable, as the new 10, 18, and 24MHz bands are added to this version (although wire links had to be removed to activate them) and the improved r.f. board and counter unit, as found in the FT-902 are incorporated.

The FT-101ZD MkII is the last and the most popular model of the series. As well as the new bands, an f.m. or a.m. option is included and also a not very effective audio peak and notch filter.

The FT-101ZD model can be identified by looking at the mode switch. one position is marked AM/FM. As with the MkII, whether an a.m., or an f.m. board is fitted, depends on how it was originally ordered.

All FT versions were available at lower cost fitted with an analogue dial, as in the FT-101Z. At one time, the counter was available as an optional extra but these have long since sold out. (Everyone and his uncle seems to be after them, sorry I can't help with sourcing these).

Valve Tester

As some types of power amplifier (p.a.) valves become difficult to obtain and are increasingly very expensive, many people are hunting through their own and their friends' junk boxes and coming up with valves of doubtful history. Simply plugging-in any old 6146, 6KD6, or 6JS6C and the like, into a valuable rig can be a bit risky, as an internal short circuit could result in a lot of damage.

It should also be noted that p.a. valves

are usually operated in parallel and need to be approximately matched, so that one does not do most of the work and soon burn out. To solve this problem, many years ago, I put together a very basic GO/NO-GO tester and quite a number of people have asked for more details and copied it. My sample, which I still use, is so rough that I dare not publish a photo! So, I am including a picture sent to me by **Ron G0GJE** of his unit (**Fig. 2**).

The circuit is shown in **Fig. 3** and is extremely simple. Holders for 6GK6, 6JS6C, 6146 and any other 6.3V power amplifier valves that it you test, are wired in parallel and fed with the necessary voltages. It is, of course, essential to check the connections carefully as not all valves that use the same holder are wired to the same pins.

First, a known good valve should be tested; this acts as its own rectifier and indicates on the meter. Other good samples of the same type of valve, should give readings within 15% of this. The tester does not indicate any exact parameters but if two valves of the same type and make are tested and give readings that differ by less than about 5% they can be considered suitable for operation as a matched pair.

Please remember that the voltage on the top cap of the valve is potentially lethal, **so keeping one hand in your pocket is a must when testing**. The on/off switch used should also be of the spring-loaded type, so that the high voltage supply cannot accidentally be left on!

Turning the Power Down

Since the advent of the novice licence and then the foundation and intermediate grades, there has been a constant stream of 'L-plated' operators who want to keep the rules but are not too sure as to how to go about operating the average 100W rig at or below the 10 or 50W levels. As far as Morse (c.w.) operation is concerned there's no problem. You just need to make sure you have an accurate power meter, either separate or in your a.t.u., then, with the rig connected to a dummy load, press the key down and adjust the drive control until the power meter indicates your licensed power or less. When operating on s.s.b., however, it's not quite so easy.

The licensed s.s.b. power output of a transmitter is its peak envelope power (p.e.p.). This only occurs for a tiny fraction of a second on voice peaks; normal power meters don't read it accurately and even those with a p.e.p. setting are often 'way out'. The p.e.p. output of a transmitter can be accurately monitored with the use of an oscilloscope but the complications involved mean this method is not to be recommended.

Some modern solid-state transmitters are fitted with a front panel r.f. power control that sets the a.l.c. system and this simplifies the solution to the problem. When using one of these it's normally only necessary to set this control in the c.w. mode for the licensed power output and the s.s.b. output should then be okay. To double check the setting, turn the microphone gain to about halfway, whistle into the microphone with one pure tone and you should then only see your licensed output, no matter how loud you whistle!

Older solid-state transmitters normally have a front panel drive control that will adjust the output in the c.w. mode but that has no effect on the s.s.b. power. You can, of course, reduce power by turning the microphone gain down but when doing this it's extremely difficult to monitor the output and you will lose considerable 'talk power' as the a.l.c. system will not operate.

With this type of older transmitter the best move is to consult the service manual and then to locate the internal a.l.c. The alignment instructions will advise that this control should be set to give 100W (or whatever other power the rig is rated at) as part of the alignment procedure. It must **not** be set to give more output, as this could cause expensive trouble but it should be set to give 50 or 100W, to ensure that the licences conditions are kept. If this sounds too complicated, follow the second of the two procedures for valve rigs given below.

Valved rigs are difficult to effectively turn down the power on, unless provision for this was made in manufacture. The Japanese have had 20W novice allocations for many years and so some rigs were available in low power versions. While these were not generally exported, it's sometimes possible to find the 20W settings on some rigs.

To find the 20W settings may involve reducing the h.t. to half voltage by re-tapping the secondary of the mains transformer or by rewiring a voltage doubler arrangement. One of the output valves will also need disabling, this is best done by removing the screen grid voltage. Removing one valve is not an option, as this will throw out the alignment and in some rigs will disconnect the heater supply to the other valve. Unfortunately, I do not have any exact data on the above, so you will have to do a little experimenting.

If none of the aforementioned solutions are suitable, the simplest approach is to use a speech processor. This needs to be some kind of clipper, like the one fitted to the FT-101ZD or an external unit such as one of the Datong units.

With the rig set-up into a dummy load and the clipper on, whistle into the microphone. As you do this, set the output of the clipper so that no matter how loud you whistle, the power does not exceed the licensed power. If you are using the rigs internal clipper the output control may be labelled 'drive', otherwise, with an external clipper the rig's microphone gain will control how much output from the clipper goes into the transmitter.

That's all for this time, see you next month. ●

Harry Leeming G3LLL
The Cedars
3a Wilson Grove
Heysham
Morecambe LA3 2PQ
Tel: (07901) 932763
E-mail: G3LLL@talktalk.net

Harry's waiting to hear from You!
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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.

Fig. 2: Ron G0GJE's version of G3LLL's p.a. valve tester unit.

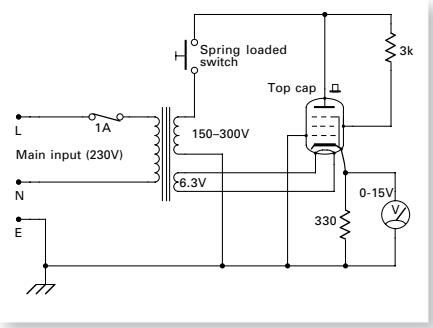

Fig. 3: The GO/NO-GO p.a. valve tester circuit.

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Practical Propagation Modelling

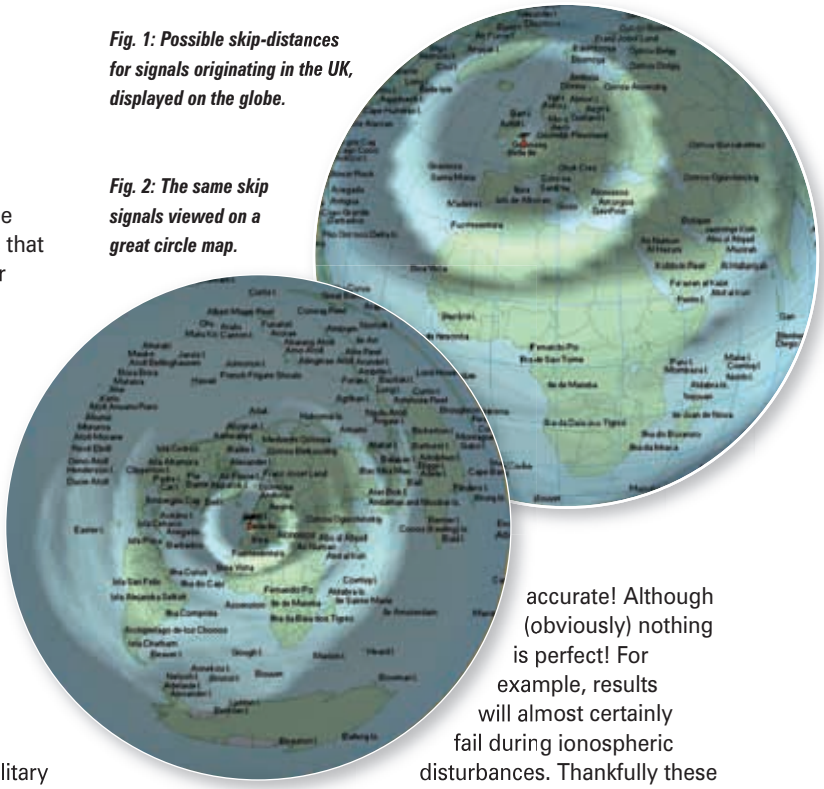


Fig. 1: Possible skip-distances for signals originating in the UK, displayed on the globe.

Fig. 2: The same skip signals viewed on a great circle map.

For several years now, I've been interested in putting propagation modelling software to critical tests to see how it mirrors the 'real' world. Many other Amateurs that I have talked to, have often mentioned that they'd had poor results with prediction software.

My present view is, that if a few simple rules and expectations are followed, very accurate results can be obtained. It's the intention of this article to provide enough information to get some practical results as quickly as possible. And without needing to know too much of the technical side.

Let's first look at how it all works. Mathematical functions and models relating to the ionosphere's behaviour have been constructed from many thousands of measurements and observations. Mostly, the observations have been performed by government agencies but Radio Amateurs and academics have also played their part. Obviously, funds for studies of the ionosphere reliability are more readily available from the military and broadcasting authorities.

However, propagation prediction isn't just for the the military and broadcasters, as Radio Amateurs can benefit from this work too. Based upon the observations and empirical formula, the ionosphere can be divided up into tiny sections or areas. Each one of these sections can be characterised in the way it behaves to an electromagnetic wave. We, as Amateurs, can then trace our signal through each section and construct maps and charts to fulfill on-air requirements.

Available Software

With propagation software, the original versions were put together by organisations such as Voice of America, the BBC and the US Defense Departments. These have culminated in programs such as *VOACAP* and *ICEPAC*.

The programs are not the easiest of software suites to use for the layman on their own but thankfully some clever people have designed their own user-friendly front-ends. The new software simply uses the prediction programs as data crunching 'engines'. The outputs from these engines are then displayed to the user as required.

My favourite front-end is called *Hamcap*. I use it along with *DXATLAS* to allow some alternative map views (you can see these from the two screen shots). Looking at them, can you see the first clearly defined skip zone as shown in **Fig.s 1** & **2**?

Does It Work?

You may ask "But does the prediction software work?" The answer is yes! If used correctly, the results are extremely accurate! Although (obviously) nothing is perfect! For example, results will almost certainly fail during ionospheric disturbances. Thankfully these don't occur too often, so we can put our faith in the models at around 90% of the time.

You may wonder how I've gone about qualifying the modelling results? In answer to that question, have a look at any of the illustrations shown here. On each map, the milky areas represent possible contacts from stations in the UK. To test the modelling behind the programs would require thousands of operators in all of the areas shown to give me signal reports at the time in question. Clearly this cannot be done and a 'reversed method' is used.

The term 'reversed method' means I have asked myself "have any of the contacts made, fallen outside of the predicted areas?" The answer is invariably that they rarely have, which is a good start! In fact, once, the map indicated three small areas across the USA as being open to me. During an operating session I made numerous QSOs to stations in the USA, I then plotted their locations accurately on a map.

On comparing the map-plotted locations to the computer model, I was stunned. They were all within the predicted areas. So far, I have spent several years correlating every operating session I have done to the model results. This has enabled me to become very confident in using the models.

Getting Started

Let's now look at how to get started. First, we need to obtain a copy of the data engine used to do the number crunching. The Internet is obviously the place to look. You should download (or

Andy Foad G0FTD investigates the possibilities of using computer software to predict the areas that we can work into reliably. Read on to see if he thinks it's worth it!

get a friend to do it) the *Voacap*, and *Ioncap* suite and I suggest the website **www.dxatlas.com** will provide all the links required. *Voacap* and *Ioncap* are part of the ITS HF Propagation package. **Note:** This software is free but before installing it, take your time and read the install instructions.

You'll need to install the downloaded set of programs first. The compressed file in question is called *ITSHFBC.EXE* and is about 4.5Mb in size. This will do all the work for you. The main thing here is not to install into a directory with a long path/file name. For example, the folder pathname: 'C:\Programfiles\Radio\Propagation' won't work. But the folder 'C:\Radio' or a similarly short pathname will be okay.

The next stage is to download my suggested friendly front-end, the program *Hamcap* by **VE3NEA**. Again this software is free. A few minutes setting in your details, such as your location, your antenna's radiation angle, power level and sunspot number are the main requirements. You are now ready to model.

The milky areas on the maps shown in the illustrations, **Fig. 3** – **Fig. 18,** that resemble satellite-captured cloud images, are the places most likely to be open to us. For good measure you should download *DXATLAS*. This program is shareware and offers alternative views of the map data. It's fascinating to run lots of comparisons and see the differences. Incidentally, I have shown the differences on each band compared to differing times of day.

You can see how propagation compares with these times. Or you could try comparing one band in the summer and then again at the same time of day – but in a winter month. Again, it's a fascinating learning experience to see them.

The Sporadic E propagation, that usually occurs during the summertime cannot, due to it's nature be predicted reliably, although, on the other hand, E-Layer propagation may be predictable. Those with a keen eye may have noticed from the illustrations, that there's no 1.8MHz band option. From experience I suggest that the rule-of-thumb here, is to simply half the range of the 80m output and to adjust the corresponding signal levels by half.

The yellow line on the maps shows the current grey-line (the line of the dusk/dawn location) . And along this line there's likely to be somewhat enhanced low-band propagation for short periods as it crosses both locations.

Common Mistakes

There are a few common mistakes that you may make when initially starting out. First: if you are using the incorrect sunspot number, this will make the results unpredictable. The data engines use the predicted **annual smoothed sunspot number**. A graph of this is shown, **Fig. 19**, to aid input settings.

Generally speaking for the next year or two, an effective sunspot number to use is zero. The numbers obtained from sources like WWV, DK0WCY (or other websites) are the daily un-smoothed sunspot numbers. **Note:** More details about the sunspot numbers can be found on the internet at: **http://www.spacew.com/gic/guidance.pdf**

The second common mistake, is to use the wrong antenna type. Let's clear up a myth. Unless you are in a boat or you live on a beach then your ground conductivity is poor. This leads to severe attenuation

Fig. 3: Winter 2006/7, mid-morning on 28MHz.

Fig. 4: Winter 2006/7, early evening on 28MHz.

Fig. 5: Winter 2006/7, mid-morning on 24MHz.

Fig. 6: Winter 2006/7, early evening on 24MHz.

Fig. 7: Winter 2006/7, mid-morning on 21MHz.

Fig. 8: Winter 2006/7, early evening on 21MHz.

Fig. 9: Winter 2006/7, mid-morning on 18MHz.

Fig. 10: Winter 2006/7, early evening on 18MHz.

Fig. 11: Winter 2006/7, mid-morning on 14MHz.

Fig. 12: Winter 2006/7, early evening on 14MHz.

Fig. 13: Winter 2006/7, mid-morning on 10MHz.

Fig. 14: Winter 2006/7, early evening on 10MHz.

Fig. 15: Winter 2006/7, mid-morning on 7MHz.

Fig. 16: Winter 2006/7, early evening on 7MHz.

Fig. 17: Winter 2006/7, mid-morning on 3.5MHz.

Fig. 18: Winter 2006/7, early evening on 3.5MHz.

of the low angle radiation, often by a whopping 20dB. This also means your effective radiated power accordingly is reduced.

From your 100W rig only about 1W goes out at an angle of 5° or below. (I bet you thought it would be better than that, didn't you?) So, choose your antenna type accordingly within the *Hamcap* setup screen. Clicking on each band button will reveal the antenna's angle of radiation (**Fig. 20**).

Remember, that verticals **do not** give good low angle radiation unless they are over truly excellent ground, which does not include typical backyard soil or clay. It also doesn't include using just a few radials. Low angle radiation is everything, when working the DX.

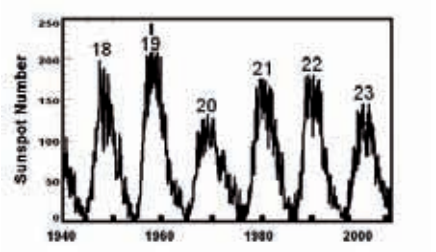


Fig. 19: The 'smoothed' sunspot numbers follows an approximate 11 year cycle.

Fig. 20: Clicking on the band-button reveals the vertical radiation pattern of the particular antenna.

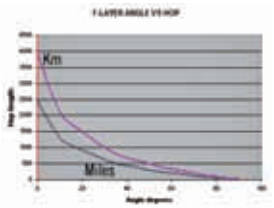


Fig. 21: The first skip distance depends on the low-angle radiation capabilities of the antenna.

Have a look at the charts for the F-layer one-hop skip distances, **Fig. 21**, compared to the angle of radiation. Now apply them to your DX station and see how many extra hops you need to make the QSO. Remember, each hop could add 6dB of loss.

Common mistake number three, is using an incorrect power rating in the *Hamcap* setup when assuming radiation at low angles. In view of the high attenuation of low angle radiation that I've mentioned, you must take power output into consideration! If you don't you will have grossly optimistic results. Learning about antennas, as well as guessing the true low-angle radiation (unless you operated on the beach) is key to getting the correct model results.

Common mistake number four is using the wrong gain figure for your antenna. Remember due to ground conductivity and reflections it is possible for even a simple antenna to exhibit a few dB of gain.

If you were to condense all the above into one golden rule it would be: 'You're more likely to get over-optimistic results than pessimistic results if you use it incorrectly'.

Have fun with your predictions! ●

[‡1] **www.dxatlas.com** has links to programs mentioned in the article.

Taking a look at Blackwood Amateur Radio Society – GW6GW

The Blackwood Society was originally formed in 1932 by a small group of dedicated radio experimenters who met regularly to discuss the latest techniques. The first licensed Amateur was **Frank Mudford G6BK** (BK for Blackwood). (Note the G and not GW),

Blackwood was in the old border county of Monmouthshire then and it was left to the individual licensee whether they wanted to be located in England or Wales! (The society is now firmly situated in the county of Gwent in Wales). Other past members included **Austin Forsyth G6FO**, who later became managing editor of Short Wave Magazine and **Gwyllym Williams GW6GW**, whose callsign the society now holds.

The society was originally known as Blackwood Radio Transmitters Club in 1932, but the name was soon changed to the Blackwood Radio Society to acknowledge the importance of short wave listeners and their contribution to the hobby. The earliest photograph (**Fig. 1**) in the society archive shows a field day activity in 1935, in open fields North of the town (G6BK seated in deckchair).

An important member of the society around this time was **Arthur Moore**, (s.w.l. and experimenter) who worked and built equipment for Marconi and played a part in the first transmissions by radio waves over water from Lavernock Point to Flat Holme Island in the Bristol Channel. His skills at receiver building had come to Marconi's attention after Arthur famously received the distress signals from the Titanic on his home built station at the Old Mill, Gelligroes, a 17th Century water powered grain mill. This historic site is activated by the society on special occasions as GW6GW/P by kind permission of the new owner, David Constable and features on a special QSL card.

Activity Suspended

With the advent of The Second World War in 1939, all Amateur Radio activity was suspended. Most members entered the armed services and went into radio work, those who were too old joined the Radio Monitoring Service (notably G6BK), latterly known at the 'Secret Listeners'.

One of those who entered the armed forces and served as a radio telegraphist aboard minesweepers between 1944 and 1956 was **Peter Fulton GW3MMU** and it was Peter, who was instrumental in reforming the Blackwood society in 1960.

It had come to Peter's and other local Amateurs' attention that several local lads were indulging in "unauthorised transmissions" using surplus wartime radios such as the 18 and 19 Sets, which were readily available for pocket money prices. Recognising their enthusiasm for Amateur Radio, Peter set up a training programme at the reformed society to enable them to obtain their Amateur Radio licence. This training ethos has remained a feature of the society and Foundation, Intermediate, Advanced and Morse Training courses are now currently offered.

During the 1970s and 1980s, as well as running the Radio Amateurs Examination (RAE) class, Peter did a lot of voluntary work with the Royal Naval Lifeboat Institution (RNLI), training radio operators and writing training manuals. His dedication was recognised with the award of an MBE and the rare honour of having a lifeboat named after him and his wife, the Peter and Marion Fulton.

Welsh Amateur Radio Convention

The original meeting place of the Blackwood Radio Society was a prefabricated bungalow, which the members had purchased and built themselves, sadly this was vandalised and destroyed in 1966 and the society moved to its present home at the Oakdale Community College near Blackwood. It was here that the first Welsh Amateur Radio Convention was held in 1975.

The Convention combined a traditional rally with guest speakers, one of note was **Louis Varney G5RV** and in 1984 **Dr Tony England W0ORE**, who flew aboard the Challenger Space Shuttle the following year and spoke to the club station while in orbit.

In recent years, the event has reverted to a traditional rally held at the Newport Centre. However, the 2007 rally on the October 21st will be held at the Crosskeys Campus of Coleg Gwent, five miles North of Newport, Risca Road, Crosskeys, Gwent NP11 7ZA. It seems appropriate that the rally, which celebrates a technical hobby of self training, has returned to a seat of learning. Full rally details can be obtained from **Dave** on **(01495) 228516** or via E-mail at **www.gw6gw.co.uk**

Anniversary Celebrations

To mark the 75th Anniversary of the Blackwood Society, the special callsign, **GB6GW** has been obtained. All contacts will receive the special QSL card, (**Fig. 3**), depicting Amateur Radio from the steam age to the rocket age.

More information about the society, how to join, club activities, rally news and much more are available at: **www.gw6gw.co.uk** ●

Fig. 1: The Blackwood Radio Society Field Day in 1935.

Fig. 2: Peter Fulton GW3MMU on the right with G6BK in 1962.

Fig. 3: The special QSL Card for GB6GW 1932 – 2007.

Bob Jones GW4FCV promotes the Blackwood ARS as he gives a potted history of the club's 75 year history.

Project

A Bi-Directional Transceiver

The BITX 20 is a bi-directional transceiver that delivers 6W of high quality single sideband (s.s.b.) on the 14MHz Amateur band. And it's bi-directional in more ways than one! Broadband stages are used in both transmit and receive modes and the design by **Ashar Farhan VU3ICQ**, an Indian Radio Amateur, mixes ideas from East and West.

Ashar VU3ICQ's plan for this deceptively simple looking transceiver was to use easily available parts so that Amateurs in low-income countries could build their own gear and get on the air. The BITX 20 avoids expensive integrated circuit (IC) components. Instead most functions are performed by *npn* transistors.

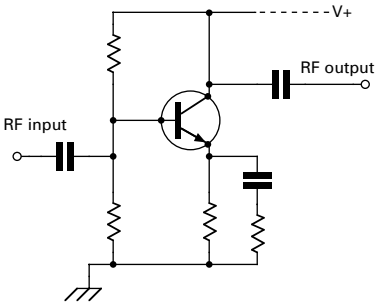


Fig. 1: A simple broad-band amplifier using a single* npn *transistor.

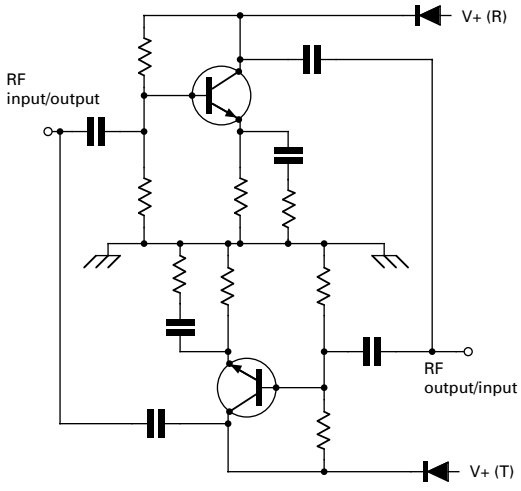


Fig. 2: Putting two amplifiers in reverse-parallel allows the direction of the signal to be selected by 'steering' diodes.

The singly balanced mixer uses just four 1N4148 small signal diodes and the highly effective s.s.b. ladder filter is made up from four cheap 10MHz crystals. In place of the ferrite that never seems to be quite what you have in your junk box, the toroids can be wound on ordinary half-inch tap washers (which, in India are apparently made of nylon!).

John Seagar G0UCP describes an extremely simple 14MHz s.s.b. transceiver that came originally from a design by Indian Radio Amateur, Ashar Farhan VU3ICQ and willing co-operation from around the world.

Note Pad & Calculator

During a long haul air journey, Ashar drew up the elements of the circuit using just a note pad and a pocket calculator. Particular care was taken to ensure matching impedance between each stage and the ones on either side.

Like many others, Ashar had been excited by *Experimental Methods in RF Design* (ARRL 2003) and the ideas of **Wes Hayward W7ZOI**, one of the authors. Farhan started with a basic *npn* broadband transistor amplifier, **Fig. 1**. He noted that two of these, placed in 'reverse-parallel' as in **Fig. 2**, could be used in the signal path of a transceiver. The signal could be amplified in a forward direction for transmit (T) or in a reverse direction for receive (R) by applying power, through 'steering' diodes to one or other of the transistor pair.

Ashar uses three of these back-to-back broadband amplifier stages before and after the diode mixer and the ladder filter. This ensures each stage is properly terminated with the correct impedance in either direction. It is the main reason for the outstanding performance of his BITX design and also simplifies switching arrangements – so it would be quite possible for transmit-receive changeover to be made with a double pole double throw (DPDT) switch. The whole ingenious circuit can be downloaded from **http//www.phonestack.com/farhan/bitx.html**

Unique Appeal

Hans Summers G0UPL spotted the unique appeal of the simple project. So Hans, together with Ashar VU3ICQ, set up a discussion forum, the BITX20 Yahoo! Group, as a resource centre for builders.

The lively site has led to international discussions ranging from the basic, "What's a tap washer?" from an Amateur in a country where the basins have hot and cold faucets and don't use the term 'tap', to the intrepid but frankly alarming domestic microwave test of electromagnetic materials. (Don't try this at home!)

The site reflects the seemingly universal appeal of using the simplest possible elements to get a first class s.s.b. signal on the air. As usual with Amateur Radio there have been contributions from all parts of the globe including the USA, India, UK, Holland, Brazil and New Zealand.

One American Amateur on a business trip to Mumbai (Bombay) wanted to build a BITX while he was visiting the Indian Sub-continent although the local stores were a little short on some of the requirements. Immediately there was an offer of help from an Amateur in Lucknow. A full kit of parts costing just 300 Rupees (US$6) would be no problem, though at a distance of about 1200km (approximately 745 miles) he was told that "The courier will take two days to deliver."

Getting Going

What about building BITX20 in the UK? Actually, I found this to be very straightforward. I first downloaded Ashar's circuit and comprehensive construction information from his website. He gives not only the theoretical background but also provides a very detailed account of the practical problems that might occur!

The instructions are clearly written and recognise that everyone will have their own approach to layout. They may, for example, prefer to use a favourite design for the variable frequency oscillator (v.f.o.) circuit rather than copy his.

The photographs show a version that I have put together using a classical breadboard technique. Even a BITX takes up quite a lot of space, particularly if you decide (as I did) to lay it out in a logical sequence with the various stages more or less side-by-side.

To fit more, in I used a sheet of copper clad board supported on polythene spacers. I mounted the v.f.o. underneath and a small sub chassis above it to take VU3ICQ's neat two-stage power amplifier (p.a.) stage.

I built each stage 'ugly' style, with the receiver and microphone amplifiers together, with the beat frequency

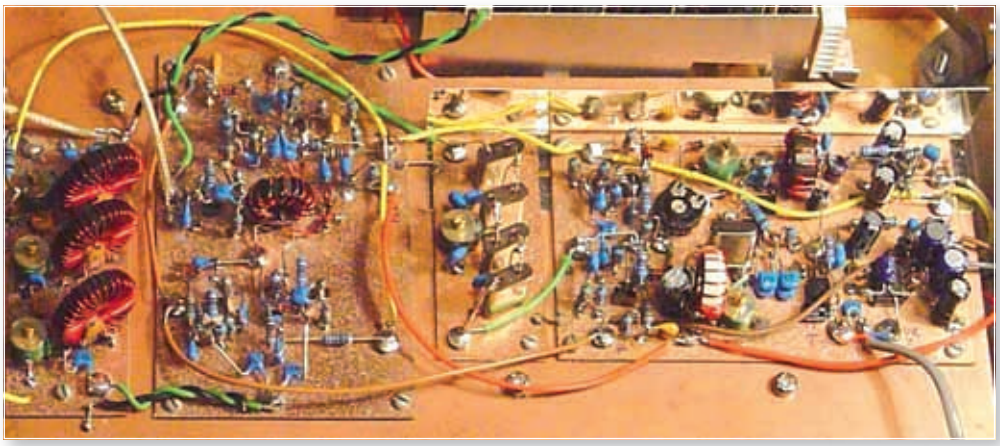


Fig. 3: The main circuits of the BITX20, as built by G0UCP.

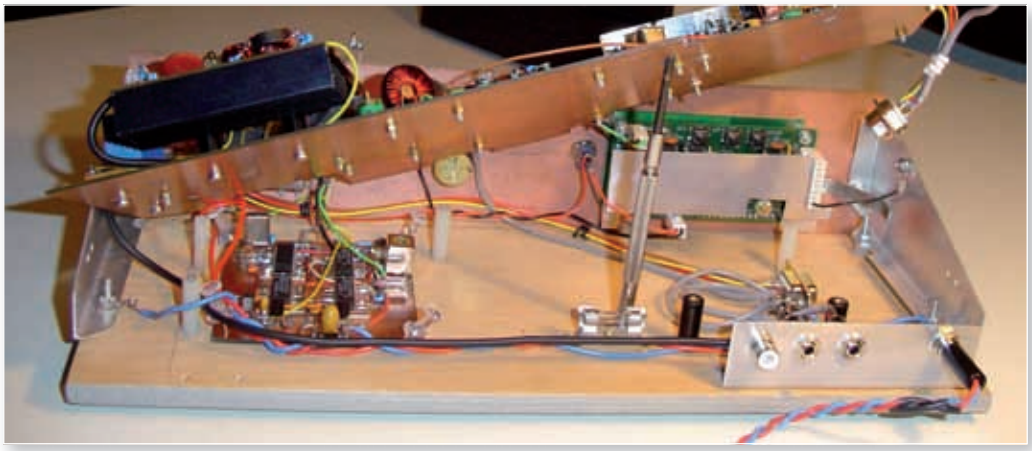


Fig. 4: The additional circuits that were added to complete the project.

oscillator (b.f.o.) on one board and the diode mixer and its adjacent broadband amplifiers on another. These are seen at the left and centre on the photograph, **Fig. 3**.

The r.f. filter with its three tap washer toroids was built on a separate small board so that it could be easily changed for different values if the frequency was altered. Standard UK 'half-inch' black plastic washers seem to be a satisfactory substitute for the originals.

The ladder filter with its four crystals, seen between the two main boards in Fig. 3, is mounted separately. This is simply because I like to see the way theory turns into practice – and it looks just like the circuit diagram!

Many Variations

One of the delights of the BITX20, is that it can be built in so many different ways and if we want to we can even add some features just for fun. Ashar VU3ICQ himself has remarked that the pursuit of simplicity for its own sake can become a way of life!

The v.f.o. in the original uses a Colpitts circuit with a varactor for fine-tuning. Perhaps it was the prospect of winding the 150 turns on a tap washer for the main inductor that I decided to use a v.f.o. I had prepared earlier. This can be seen in **Fig. 4**, pinned to the breadboard underneath the main assembly and yes it does include some integrated circuit (i.c.s)!

My v.f.o. is a 'huff and puff' design by **Charles Fletcher G3DXZ**, originally in the **Radio Society of Great Britain's** *Radio Communications* in December 1997. The stability of this 'stay-put' device is excellent and it's particularly helpful in ensuring that low power (QRP) contacts are not lost through drift. The red reset button seen beside the tuning knob below the R/T change-over switch on the front panel is pressed after the initial warm-up period and at intervals of a few minutes after that.

Frequency Display

For the frequency display I used the **Minicounter** from Cumbria Designs (reviewed in *Practical Wireless*, July 2004 by **Tex Swann G1TEX**. At £39.95 the counter meets the G QRP Club requirement of doing more for less! This admirable counter makes it unnecessary to use a calibrated tuning dial as it can be fed directly from the v.f.o.

Even a stay-put huff and puff oscillator drifts occasionally and the Minicounter has a useful 'delta mode', which will register any deviation up or down as a separate display. A little screening – as shown on the photograph – ensures there's no interaction with neighbouring toroids.

Possible Problems

Most of the possible problems have been anticipated by VU3ICQ and somewhere on the Yahoo! site there are answers to the few that haven't. One minor gremlin is an ironic one in that the original design does use one i.c., the ubiquitous LM386 audio amplifier for the receiver output. As luck would have it there was a typo on the circuit diagram and pin 6 and pin 5 were the wrong way round.

The only real snag I met with was a tendency for the IRF510 power amplifier to oscillate and heat up whenever it was coupled to my doublet via the antenna matching unit (a.m.u.). This did take a little sorting out. But I found that reducing the value of the 2.2kΩ resistor between the base and collector of the driver transistor (2N2218), by putting a 1kΩ resistor in parallel with it improved the situation.

I also substituted a 300pF ceramic capacitor for the 100nF specified for coupling the bifilliar p.a. inductor (T1) to the low pass filter. I also placed a 36pF trimmer as a neutralising capacitor between this point (i.e. where the 300pF capacitor and T1 join) and the gate of the IRF510. This has completely resolved the problem and the Stockton power meter records a reliable 6W on whistling into the microphone.

Receiver Performance

The performance of the receiver was far above my expectations. Initial adjustment of the b.f.o. confirmed that it's possible to exclude the lower sideband so effectively that it's inaudible on all but the strongest c.w. signals.

The clarity of s.s.b. reception is particularly sharp and this reflects the careful interstage matching, which gets the best possible performance from the mixer and crystal filter. As VU3ICQ points out, there are only three active devices between the antenna and the receiver audio.

The transmitter holds its own very well indeed. Over a month or two of operation my logbook shows best DX as PJ4 (Dutch Antilles) to the West and UN7 (Kazakhstan) to the East.

In a few hours on the CQWW contest I made contact with several USA stations and FM5 (Martinique) in the Caribbean. All with 6W and a doublet antenna! Of course, the contacts were on 14MHz – not the easiest band for QRP work!

An obvious modification would be to double the v.f.o. frequency from 4 to 8MHz and operate on the 18MHz (17m) band where there should be no difficulty in getting round-the-world coverage.

Bidirectional Help

The BITX design involves creative thought from India and the USA. Ashar Farhan VU3ICQ generously acknowledges his debt to **Wes Hayward** and others, so it's not just the circuit which is bidirectional. The Yahoo! site, (with dry humour from Hans Summers and Farhan himself) allows Radio Amateurs all over the world to tap into the resource for advice and even practical help. Perhaps, I have now encouraged others to try it out? ●

The Story of *Radio Constructor*

Editor's introduction: I have no doubt that some readers might ask the question, 'Why feature *The Radio Constructor* magazine during the 75th birthday celebration year of *PW*?' To this question I would unequivocally state that *The Radio Constructor* (*RC*) itself played an extremely important part in the development of hobby radio and electronics in the United Kingdom. During the planning stages for the 2007 magazines in September 2006, I intentionally scheduled Mike G3TEV'S article as a tribute to *RC* in our celebration year. This is because many of our readers (and I include *PW*'s **Tex Swann G1TEX** and myself in this category) also appreciated *RC* and the projects and features that appeared within its pages over the years. When *The Radio Constructor* finally closed there was no fanfare or tribute that I can remember. However, I hope that Mike's article goes a long way towards honouring a worthy magazine that we all miss. **Rob G3XFD**

To tell the story of *The Radio Constructor* magazine we have to go back to the end of 1945, where it starts with one **Bill Overland G2ATV** who had the idea to publish a magazine for the Radio Amateur and short wave listener. The company he formed first appeared with the title **The Amalgamated Short Wave Press**. He lived at Debden House in Maida Vale, London and the offices of the company were at 57 Maida Vale.

The new magazine, *Short Wave News*, appeared on January 1st, 1946, priced at 1/3d (7.5p) and was edited by Bill Overland G2ATV who was assisted by **Arthur Gee G2UK** and **Joe Peerless G3JPJ** (both of whom were still in the Army).

The main content of the magazine was the logs received from short wave listeners of stations both Amateur and broadcast that they had heard. It was at this time that the **International Short Wave League** was founded and it became associated with *Short Wave News*.

Severe Paper Shortage

After the Second World War (even up to the late 1940s), there was a severe restriction on the amount of paper available for printing. *Short Wave News* found it increasingly difficult to print all the constructional articles submitted for publication. A decision was then taken to launch another magazine that would be devoted entirely to constructional topics when paper became available - *The Radio Constructor* was on its way!

In August 1947, the first edition of *The Radio Constructor* (*RC*) appeared on the shelves priced at 1/3d (7.5p). The editors were Arthur Gee G2UK and **W Norman Stevens G3AKA**, the Technical Editor was **Lionel. E. Howes G3AYA** and the Advertisement & Business Manager was G2ATV. It would appear that early editions of *RC* had a very limited print run due to paper restrictions, early editions are very hard to find.

Both the *Short Wave News* and *RC* magazines were pocket-sized and continued as separate magazines until December 1953. In the early 1950s **Austin Forsythe G6FO,** the proprietor and editor of *The Short Wave Magazine,* objected to the use of the name *Short Wave News* and the magazine was re-named *Radio Amateur.* This title first appeared in January 1952 and at the same time the company name appears to have been changed to **Data Publications Ltd**.

Unfortunately, the newly named magazine was, apparently, not a success and the last issue of *Radio Amateur* appeared in December 1953. However, it was

Mike Mills G3TEV delves into the history of *The Radio Constructor*, a magazine that many *PW* readers enjoyed. Mike has already featured J. R. Davies – the man behind the very popular *Radio Constructor* series entitled In your Workshop. Now, Mike tells the fascinating story of a publication that shared many authors with *PW* but still maintained its own unique style and content.

incorporated into *The Radio Constructor* and the name was still there in the title page – right until that magazine ceased publication in 1981.

Editor Until 1960

The Editor of the combined magazines was Bill Overland G2ATV and he continued for many years in this post until his untimely death in March 1960 After his death no one person was named as editor but it's fairly obvious that Arthur Gee (G2AK) and J R Davies had a considerable input to the content of the magazine.

The offices remained at 57 Maida Vale for the whole of the magazine's existence. There appears to never have been more than about six people involved in the production of the magazine and the office was described as being in a "chaotic state" by one visitor!

Design & Contributors

In August 1961 the magazine appeared in the larger format of 9.75 x 7.25 inches. Incidentally, the cover design changed at least six times during the magazine's existence and some of these are shown in the photographs shown here.

There were several long-time writers for *RC*. Suggested Circuits for the experimenter written by **G A French** appeared from the December 1950 edition right up to the end of publication and I believe that that he was employed by **Henry's Radio Shop** in the London's Harrow Road. The articles consisted of a circuit diagram and relevant data in a very basic form but there was enough to enable one to produce the featured item.

Another author who appeared from about 1949, was **J R Davies** who wrote the In Your Workshop series that lasted so long and was avidly read by all. He also wrote many articles under many aliases so it is almost impossible to ascertain all of them! Incidentally, he also wrote for *Practical Wireless* and I recently obtained some copies from the 1950s and in them he was writing a series on the use of relay control.

Probably, the most famous series by J R Davies was about a fictional repair shop and concerned 'Smithy' the repairman and his assistant Dick who undertook and solved equipment repairs and also discussed technical details in a very easily understood and well-written manner. As he had been engineer in charge of the television and sub-assembly department of Ferguson Radio Corporation this probably gave Davies many ideas for his fault-finding articles

Davies also wrote a book titled *Understanding Television*, which was published by Data Publications and ran to over 500 pages. At the time of his death in 1981, he was the technical editor of what had been re-named *Radio and Electronics Constructor*, which was still published by Data Publications Ltd, no doubt renamed to keep in touch with changes in the hobby.

The magazine, as published by Data Publications, only appeared until the August/September 1981 issue. The magazine still appeared but was then published by a company based in Brentwood, Essex. It later appears to have been incorporated into *Radio and Electronics World* published by a company called Ambit, who as many *PW* readers will remember, were well known component suppliers.

Note: In your Workshop still appeared for some time after the death of Davies but whether these were written by him is open to conjecture.

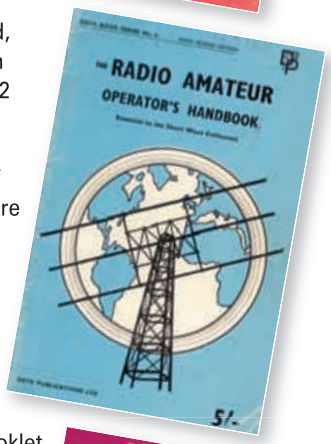
Other well known authors were **R A Penfold** and **F G Rayer G3OGR**. There was a page of comment by **'Centre Tap'** entitled Radio Miscellany, who appeared to be a Radio Amateur but his real name is still a mystery, although my guess it was Bill Overland because at about the time of his demise the article was re-titled *Radio Topics* written by **Recorder** and from some of the comments it would appear that J R Davies wrote quite a few of them.

Also we must also not forget **Sir Douglas Hall** with his ingenious (and famous) reflex circuits!

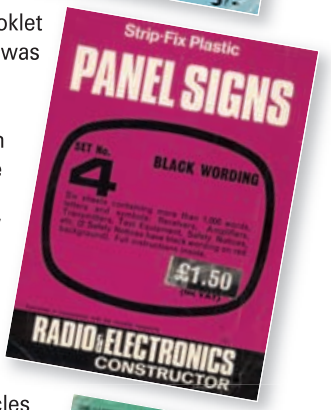
Data Publication Booklets

Besides the magazine, Data Publications also produced a series of booklets on various subjects. Perhaps the most famous was *Inexpensive Television*, which dealt with the conversion of ex-Government surplus equipment into television sets.

Many thousands of copies of this booklet must have been sold, judging by the number of television receivers using such items as the 62 Indicator Unit fitted with a VCR97 6-inch cathode ray tube and its associated TR1355 receiver (part of the Gee navigation system) that were in use up to the mid-1950s.



Another best seller was the *Radio Amateurs Operator's Handbook,* which listed country pre-fixes, UK counties and a host of other information useful to the short wave listener and Radio Amateur. They also published a booklet entitled *Television Picture Faults* (it was also a best seller), which was often supplied with new TV sets to help new owners solve various common problems that often occurred in the early days of mass TV ownership.



Other books were *Radio Control for Ships, Boats & Aircraft* by **F C Judd** (Fred Judd G2BCX), *TV Fault Finding*, which ran to several editions as TV standards changed. They also published a series of re-prints of published articles such as – Tape and *Wire Recording, Receivers*, *Pre-selectors & Converters*, and *Inexpensive Car Radio Radio Control Mechanisms* Altogether a very comprehensive list to suit all tastes!

The Panel Signs

Another item was a series of transfer labels for many types of electronic projects sold under the name of Panel Signs. These became very popular with hobbyists and there were as least four series with different type of label such as black on white or vice versa.

The demise of *The Radio Constructor* meant that the magazine was very much missed by its army of readers but I doubt if a publication with such a wide range of subjects would be viable today. Especially with the great dearth of firms supplying components and the lack of home construction.

My thanks and acknowledgements are particularly given to the many people who have given me the information about the early days of *The Radio Constructor*, without whose help this article could not have been written. Any other information to add to this story would be most welcome!

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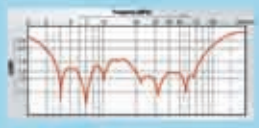

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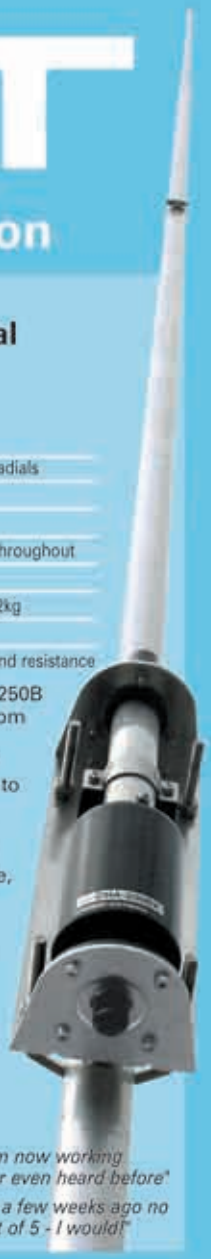

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Antenna Workshop

Rugby based G0NZI (C. D. Peake) says that a small garden shouldn't be a limitation to working on the 1.8MHz band as he describes a simple 'Top-Band' antenna for restricted locations

Many recently built 'new houses' can hardly be classed as 'real estate'. Compare this to the situation a few years ago, when the average new house had a rear garden of perhaps 20-30m (65-100ft) long by some 3-8m (10-25ft) wide. I remember when I lived with my parents, that there was one house nearby in particular, that had a garden of over 40m (130ft) long. A garden that would have been excellent for erecting large wire antenna arrays.

However, the last two houses that I've bought, have had gardens the size of the proverbial postage stamp, averaging around 11x4m. The latest garden being only 10x4m. So, how on earth do you get around covering all the h.f. bands in the restricted space of such a small area?

The simple and easy answer to that was the excellent V9 h.f. vertical antenna, a visually unobtrusive antenna by the well known and respected British manufacturer Sandpiper Communications. The Sandpiper V9 antenna covers all bands from 1.8 to 28MHz. This relatively small ground mounted vertical stands around 5.9m tall.

I've had one of the V9 antennas for some time, it's great, I had no problems and a lot of success with it over the last six years. I have a friend who also owns a similar V9 antenna and who has recently moved house. Then, when the antenna was installed, the local neighbourhood seemed to become keenly proactive with regards to restrictive covenants. The upshot of this reaction was that my friend's antenna or indeed any other new structure was not to exceed 3m in height!

So, after an unexpected visit from 'Mr. Local Council Official', down came my friend's V9 antenna, to be replaced with the Maldol HVU-8 multi-band antenna that stands only around 2.5m high. And while this antenna covers almost all of the h.f. bands, it doesn't cover the 1.8MHz band at all.

As a result of the restrictions I set about to create, specifically for the 1.8MHz band, the antenna design described here. It's an antenna that's usable, in that it has a reasonable bandwidth, has low visual impact and it's easy to construct with minimal outlay.

Centre-Loaded Sloper

The antenna design that I've created is basically a 'centre-loaded sloper' antenna, fed via coaxial cable running down to the far end of the garden at fence level, (thus keeping the feed-point away from the house). The antenna is anchored between the top of the far fence or wall and the eaves of the house using the halyard system as shown in **Fig. 1**. It's fed against ground with a wire counterpoise – a 20m (66ft) length seems to work fine, though no doubt longer or more counterpoise elements could be added to (perhaps) improve things.

The actual construction of the design is very easy – the only minor difficulty may be winding the coil, which consists of 175 turns of 0.7mm (22s.w.g.) enamelled copper wire. These turns are close-wound centrally on a 300mm length of 41mm diameter waste-water pipe.

Winding the 175 turns on the plastic pipe results in an inductance of (around) 350μH. Once that is done, drill suitable holes at each end for the wire anchor points and secure the coil ends with nylon friction lock cable. The former and its coils should look as shown in **Fig. 2**.

The first test after building and installing was to find the resonant point at which the background noise peaks. Given that the end length of wire is deliberately over-length as the starting point, it'll probably need to be shortened to raise the resonant frequency and bring it in-band. The best way of doing this is not to actually cut the

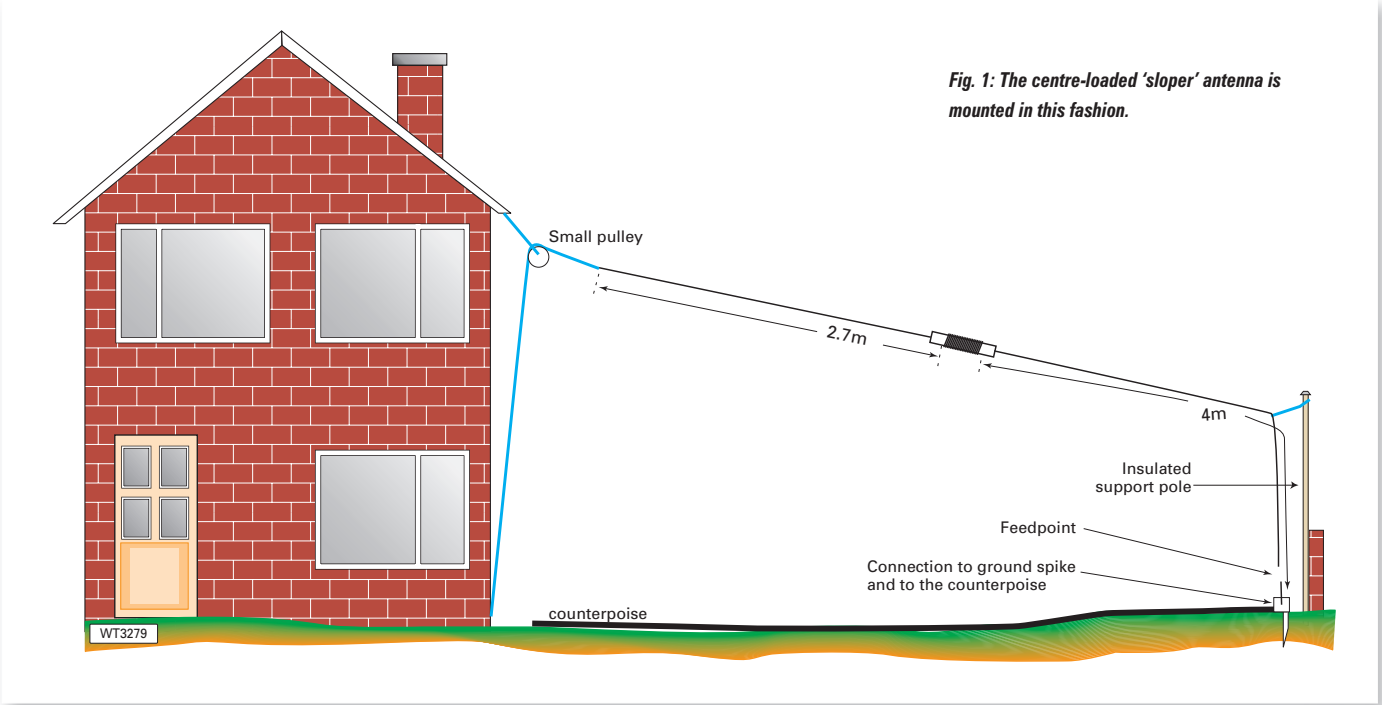
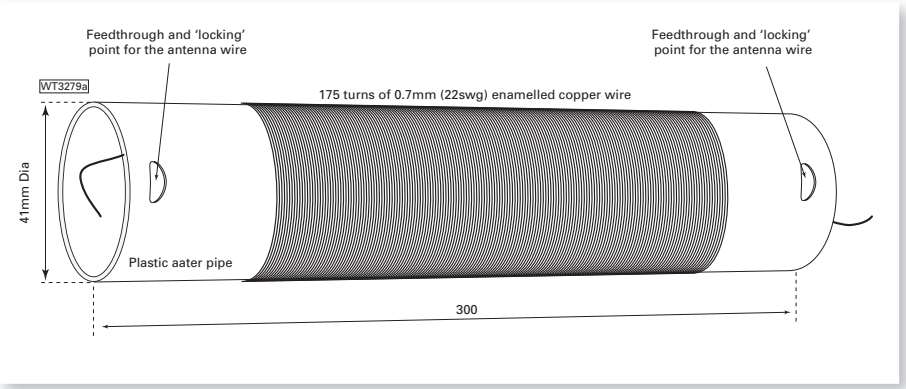


Fig. 1: The centre-loaded 'sloper' antenna is mounted in this fashion.

Fig. 2: The centre-loading coils is wound on plastic water pipe.



end of the wire but to pull it through the end insulator about 10-15mm at a time and wind it back on itself.

Once you have achieved the low s.w.r. at your chosen operating frequency it can be left in-situ until any further tuning or maintenance is needed. ●

Parts List

- 1 300mm long x 41mm diameter of waste pipe – from d.i.y. stores. £2+ for 2m length.
- 0.6-1.2m length of copper pipe for ground spike & counterpoise wire. Up to £2.
- 28.5m of 16/02 pvc covered wire or 5A lighting flex or equivalent: up to £2.
- 2 x End insulators – but you could make your own with any left over lengths of pvc pipe.
- 1 x SO239 UHF socket: up to £1.
- Solder tag for the ground side of SO239 and copper pipe earth spike.
- Total cost should be under £10 plus the cost of the 50Ω coaxial cable to feed it.

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TS-2000X-HF/6/2/70/23cm £1695.00.
TM-G707-Dual Band Mobile £265.00.
TM-V7E - 2m/70cm's..... £359.00.
TH-F7E - 2mtrs/70cm's..... £199.95.
THG-71E-Dual Band Handy £169.00.
TM-271E-2m/FM Mobile TX/RX £185.00.
TM-V71E - VHF/UHF Trx £268.00.

ICOM IC-7800MK2 *IN STOCK*
*** FREE SPEAKER SP-20! ***

ICOM

2 YEAR WARRANTY

IC-E2820 Dualband VHF/UHF £379.00.
IC-7800-2 HF/50MHz 200W.....£6400.00.
IC-756PRO3 - HF/50MHz .....£1995.00.
IC-7400 - HF 6m/2m 100W.....£1295.00.
IC-7000 - HF/6m/2m/70cm's.....£899.00.
IC-718 - HF 100W.....£439.95.
IC-910H - 2M 100W/70cm 75W £1089.00.
IC-E7 - Mini Dual-Band Handy...£169.95.
IC-E91 - Top Flight Handheld....£239.95.
IC-706M2G - All-Mode TX/RX ....£649.00.
IC-E90 - 2m/6m/70cm Handheld £199.95.
PW-1 Amplifier 1KW solid state £3995.00

YAESU

2 YEAR WARRANTY

FTM-10E - VHF/UHF Trx NEW £248.00
FT-897D - HF/6m/2m/70cm...£579.00.
FT-817ND - 1.8-430MHz 5W..£349.00.
FT-857D - HF/6m/2m/70cm's £495.00.
FT-7800E - 2m/70cm mobile. £169.00.
FT-8800E - 2m/70cm mobile..£219.00.
FT-8900 - 10m/6m/2m/70cm..£249.00.
FT-1802E - 2m 50W mobile...£129.00.
FT-2800M - 2m 65W mobile...£159.00.
VX-7R - 6m/2m/70cm handy..£209.00.
VX-6E - 2m/70cm handheld...£165.00.
VX-2E - 2m/70cm handheld...£115.00.
VX-150 - 2m handheld 5W.....£89.95.
VX-120 - 2m handheld 5W.....£98.00.
VX-170 - 2m handheld 5W.....£105.00.
FT-60E - DB *limited Stock*..£129.00.
QUADRA VL-1000 .....£3750.00.

YAESU FT-2000 - £1739.00
FT-2000D 200W - £2389.00

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MFJ TUNERS

MFJ-989D 1500W Auto ATU..£329.95.
MFJ-986C 3Kw HF.....£299.95.
MFJ-991B Auto Intellituner....£199.95.
MFJ-976 1500w ATU .....£429.95.
MFJ-969 300w Rollercoaster £149.95.
MFJ-962D 1.5Kw Inductor.....£249.95.
MFJ-949E 300w W/D-Load....£124.95.
MFJ-948 300w HF.....£109.95.
MFJ-945E Mobile .....£89.95.
MFJ-941E 300w .....£99.95.
MFJ-934 ATU+AG .....£179.95.
MFJ-921 2m ATU.....£79.95.
MFJ-924 70cms .....£79.95.
MFJ-914 Extender .....£69.95.
MFJ-901B 200w Versa tuner...£74.95.

MFJ-259Z, Batteries, Loop & charger.
£239.95.

Reads SWR + Resistance(R) & Reactance(X) or Magnitude(Z) & Phase(degrees). Coax loss(dB), Coax cable length & Distance to fault. plus more.

Analysers

MFJ-249B 1.8-170 Dig.....£219.95.
MFJ-259B 1.8-170 .....£199.95.
MFJ-269 HF/VHF/UHF .....£269.95.
MFJ-201 grid dip meter.....£119.95.
MFJ-269PRO 1.8-170&430-520 £319.95.

Dummy Loads

MFJ-250 1kw Oil filled .....£69.95.
MFJ-250X 1KW without oil .....£49.95.
MFJ-260C 300w PL259 .....£32.95.
MFJ-260CN 300w N-Type .....£49.95.
MFJ-264 1.5kw PL259 .....£69.95.
MFJ-264N 1.5kw N-Type .....£74.95.
MFJ-267Load/VSWR .....£149.95.

Kuranishi - Analyzers.

BR-210 1.8-170MHz with S0-239 socket £359.95
BR-400 100-170 & 30-500MHz £369.95
BR-510A 1.8-170MHz, S0-239 socket £439.95
BR-510D 1.8-170MHz & 300-500MHz S0-239/N socket £479.95

New lower prices on..

HEIL SOUND

PR-781-PTT deluxe base mic...£99.00.
Pro-Set-Plus Headset .....£132.95.
Pro-Set-Plus-IC Headset .....£94.95.
Pro-Set-HC-4/5 Headset .....£84.95.
Pro-Set-HC-IC Headset .....£94.95.
Goldline GM-4 Stick mic .....£89.95.
Goldline GM-5 Stick mic .....£89.95.
HM-4 Handy mic w/HC-4 insert £59.95.
HM-5 Handy mic w/HC-5 insert £59.95.
HM-IC Handy mic + Icom insert £59.95.
HM-10-4 Hand mic + HC-4 £56.95.
HM-10-5 Hand mic + HC-5 £56.95.
Traveller-817 Yaesu headset. (traveller headsets require leads)

W4RT Accessories

BOSS-II - Auto control for screwdriver ant 6-160m W/icom interface cable ..£119.95.
OBF-817 - One board filter dual Collins SSB/CW filter for FT-817 ..... £199.95.
OPP-817+ - One plug power plus - 9.6V NiMH battery for ft-817..... £47.95.
OPP-817+KIT - 9.6V NiMH FT-817 battery cover needs OFC-817 ..... £54.95.
FT-817 - Adjustable stand .....£19.95.

Comet Antennas

Comet H422 - High power 1Kw, 4 Band Rotary V Dipole. Frequencies : 7,14,21,28 Mhz **£169.00**

CHA250B broadband vertical, covers 80-6m, no gaps £295.95.

Comet V-250 3.5-54MHz Max 200w. Ideal for limited space £199.00.

GP-6 High Gain Dualband Co-Linear 2/70cm. Max 200w £85.95

GP-15 Tri-Band 2/6/70 Fibreglass Antenna. Max 150w £89.95

Watson Power Supplies

POWER-MITE * NEW * Watson 20A, £49.95

W-25AM 25A Supply.....£89.95.
W-10AM 10A Supply .....£59.95.
W-5A 5A Supply .....£29.95.
W-3A 3A Supply .....£22.95.
W-25SM 25A Supply .....£79.95.
W-10SM 10A Supply .....£49.95.

Watson Antennas

W-30 2/70 Base .....£39.95.
W-50 2/70 Base .....£49.95.
W-300 2/70 Base .....£64.95.
W-2000 6/2/70 Base .....£69.95.
WBV-70 4m 1/2 Wave Base..£39.95.

Bencher Antennas

Butternut HF-2V 40/80m .....£249.95.
Butternut HF-6V 80-10m .....£334.95.
Butternut HF-9V 80-6m .....£389.95.
Butternut HF-5B 20-10m .....£389.95.
30-MRK 30m ad for HF2V .....£114.95.
A-17-12 17&12 ad for HF6V .....£59.95.
A-6 6m ad for HF6V-X .....£19.95.
TBR-160S 160m HF2/6/9V .....£139.95.

Hustler Antennas

Hustler 5-BTV **£195.00**
5 Bands - 80-10m
Height 7.64m - Weight 7.7kg
SWR 1.15:1 - Power 1kW
Hustler 4-BTV 4 Band Vert ... £169.95

Palstar Tuners

AT-1KD Digital Display .....£279.95.
AT-1KM Regular Display .....£289.95.
AT-1500CV 1500w ATU .....£349.95.
AT4K 2500 Watt ATU ..... £649.95.
AT5K 3500 Watt ATU ..... £849.95.

Avair Power Meters

AV-201 HF/VHF .....£49.95.
AV-400 VHF/UHF .....£49.95.
AV-601 HF/VHF/UHF .....£69.95.
AV-20 HF/VHF .....£29.95.
AV-40 VHF/UHF .....£29.95.

AUTO TUNERS

AT-1000

1KW Auto ATU - 1.8-54MHz - 1-8 secs Tune - Approx SWR Rating of 10:1

£449.95

LDG Z-100

100w Auto ATU - 1.8-54MHz - 0.5 - 6 secs

£115.00

DM-7800 *NEW*

Dual meter system made exclusively for the IC-7800. This will give you a true analogue meter

£139.00

FT-METER

Plug-and-play FT-meter, specifically designed for the Yaesu FT-857 and FT-897. Gives you an analogue meter

£38.00

LDG AT-100Pro

100w Auto ATU - 1.8-54MHz 1-5 seconds Tune - 2 Pos Ant switch

£169.95

LDG RBA 1:1&4:1

1:1 or 4:1 Balun - Covers 1.8 - 30Mhz. Power rating 200w

£29.95

LDG

The world's best Auto Tuners!

LDG

Tonna Antennas.

Tonna 20506 6m 5el	£89.95
Tonna 20809 2m 9el	£54.95
Tonna 20811 2m 11el	£79.95
Tonna 20817 2m 17el	£99.95
Tonna 20909 70cm 9el	£45.95
Tonna 20919 70cm 19el	£59.95
Tonna 20921 70cm 21el	£74.95
Tonna 20835 23cm 35el	£64.95
Tonna 20655 23cm 55el	£89.95
Tonna 20745 13cm 25el	£69.95

West Mountain Radio.

RIGblaster Pro	£199.95
RIGblaster Plus Serial	£109.95
RIGblaster Plus USB	£134.95
Nomic 8P	£59.95
Nomic RJ	£59.95
M4-CBL RG45/4Pin lead	£12.95
RIGRunner 10way 12v distribution board	£99.95

Diamond Antennas.

HF10FX 10m Mobile	£39.95
HF15FX 15m Mobile	£39.95
HF20FX 20m Mobile	£39.95
HF40FX 40m Mobile	£39.95
HF80FX 80m Mobile	£42.95
CR8900 10/6/2/70	£69.95
CP6 Base 6m-80m	£239.95
X50 Base 2/70	£54.95
X200N Base 2/70	£84.95
X300 Base 2/70	£89.95
X700H Base 2/70	£249.95

Ameritron amplifiers.

AL-811XCE 10-160m 600w £729.95
AL-811HXCE 10-160m 800w £849.95
ALS-600 Solid State 10-160m 600w £1249.00
AL-1500XCE 10-160m 1.5KW £2699.00
AL-1200XCE 10-160m 1.5KW £2345.00
AL-82XCE 10-160m 1.5KW £2299.00

Radioworks Wire Ants Carolina Windom

CW-160 160-10m (252ft)	£129.95
CWS-160 160-10m (133ft)	£124.95
CW-80 80-10m (133ft)	£99.95
CWS-80 80-10m (66ft)	£109.95
CW-40 40-10m (66ft)	£89.95
CW-40+ 40-10m (66ft)	£99.95
CW-20 20-10m (34ft)	£89.95
G5RV+ 80-10m	£59.95
Radioworld G5RV Fullsize	£29.95
Radioworld G5RV Halfsize	£27.95

SGC Smartuners

SGC-230 200Watts

£339.95

SGC-230 HF	£339.95
SGC-231 HF+6m	£349.95
SGC-235 HF-500w	£749.95
SGC-237 HF+6m	£299.95
SGC-237 Porta	£529.95
SGC-237 PCB	£279.95
SGC-239 HF	£185.95
MAC-200	£339.95
SGC-211,1.8-60MHz 60W	£189.95

Rotators

G-2800SDX Rotator	£999.95
G-450C Rotator	£299.00
G-550C Rotator	£309.00
G-650C Rotator	£379.00
G-1000DXC Rotator	£429.00
G-5500C Rotator	£569.00
AR3000XL Light Duty	£54.95

Feeders & Wire

RG-213 Military Spec High grade 50 Ohm coaxial Cable

£84.95 A 100m Drum

RG58U	£0.60 per Metre
RG8 Super	£0.80 per Metre
RG213	£1.00 per Metre
W103 Westflex	£1.50 per Metre
RG-8 75 Metre Drum Special	£39.95
Flexweave 50m Flex	£29.95
Flexweave-PVC-50 50m	£39.95
Enamelled Copper Wire 50m	£12.95
Hard Drawn Copper Wire 50m	£14.95

Rotator Cable: - Color coded Cable

3 core	£0.45 per Metre
7 core	£0.79 per Metre
8 core	£1.09 per Metre

DC Connecting Cable

5A DC Cable	£0.50 per Metre
10A DC Cable	£0.75 per Metre
20A DC Cable	£1.00 per Metre
25A DC Cable	£1.10 per Metre

TGM Antennas Mini Beams

* Call for prices on TGM upgrade kits.

MQ-24SR 6-20m 2el	£379.95
MQ-34SR 6-20m 3el	£489.95
MQ-1 6-20m 2el	£329.95
MQ-26 6-20m 2el	£409.95
MQ-26SR 6-20m 2el + EH	£439.95
MQ-36SR 6-20m + Dir	£579.95

Cushcraft Antennas.

X-7 - 20/15/10 7EL Yagi	£699.95
A3S - 20/15/10 3EL Yagi	£499.95
A4S - 20/15/10 Yagi	£599.95
A3WS - 12/17 3EL Yagi	£399.95
ASL-2010 13-32MHz Log	£799.95
MA5B - Mini Beam	£399.95
D-3 - 20/15/10 Dipole	£269.95
R-6000 - 6Band Vertical	£329.95
R-8 - 40-6m Verical	£499.95
MA5V - 10/20m Vertical	£249.95

Second Hand List.

Quality Used Equipment, 3 Month Warranty.
Best prices paid on your used equipment.

AEA PK-232MBX £120.00
AEA PK-900 £199.00
AKD 7003 - 70cms FM transceiver £99.00
Alinco DJ-X10 Wide Band Rx £165.00
Alinco DJ-X2000 Intelligent Receiver £230.00
Alinco DX-77E HF Transceiver £379.00
AOR AR-1500 Wideband Receiver £89.00
AOR AR-3000 Wide Band Receiver £350.00
AOR AR-7030 £550.00
AOR AR-7030+ HF Receiver £699.00
AOR AR-8600 Mk2 530kHz-3.000GHz Wide-band Receiver £450.00
AOR AR-8600MK1 Wide Band Receiver £349.00
AOR AR8000 £139.00
AOR AR8600MkII £449.00
AOR ARD9000 Digital Voice Interface £129.00
Bearcat UBC-278 XLT Scanner £99.00
Bearcat UBC-3300XLT Scanner £129.00
Bearcat UBC-780XLT Scanner £149.00
Binatone MR600 Twin 8-channel PMR £20.00
Bnos 20AMP PSU £89.00
BNOS 432-50 70cms Amp 50w £99.00
Cobra 200 GTL DX AM/FM/SSB/CW 10 Meter Tranceiver £220.00
Comet CD-270D Meter £49.00
Comet CF-BPF6 £25.00
Daiwa CNA-1001 £149.00
Daiwa SW-110A 1.8-150MHz 20W and 200W Power Meter £40.00
Datong FL-2 filter £60.00
Datong FL-2 Multimode Filter £69.00
Diamond SX-100 Meter £65.00
Diamond SX-200 Meter £69.00
Drake R8E HF Receiver £425.00
EDC-16B adapter £9.99
ERA Mk2 Microreader £89.00
EXPLORER 1200 Linear Amp UK 1200W HF Linear Amplifie £899.00
FT-2800M 2m Mobile £115.00
FT-290R 2m Multi mode £150.00
FT-60E Yaesu 2m / 70cm FM 5W £139.00
GRE PSR-214 FM Base Scanner £89.00
Grundig Satellite 800 £349.00
Heil BM-10-5 Headset £50.00
HL-1KFX Tokyo 500W Solid State HF Linear Amplifier £949.00
Hora C-150 2m FM Handy Transceiver £79.00
IC-7400 HF, 6m & 2m transceiver £799.00
IC-756PRO-MKIII Icom HF + 6m Trx £1625.00
IC-7800 Icom HF + 6m Trx £4995.00
IC-E90 6m / 2m / 70cm Handheld £169.00
IC-V82 2m FM 7w Digital Handheld £129.95
Icom IC-R1500 Receiver £349.00
Icom AT-500 automatic ATU £250.00
Icom IC-229H 144-146 MHz £119.00
Icom IC-24ET Dual Band Handy £139.00
Icom IC-2725E £199.00
Icom IC-2800H Dual Band Mobile £289.00
Icom IC-2kl All-mode HF linear amp £999.00
Icom IC-7000 1.8 - 70cms Mobile Trx £749.00
Icom IC-706mk1 £399.00
Icom IC-706MKIIG £499.00
Icom IC-718 HF Transceiver £359.00
Icom IC-735 HF all mode TX/RX £299.00
Icom IC-736 HF 6 £699.00
Icom IC-740 HF Transceiver £389.00
Icom IC-746 HF/6m Transceiver £799.00
Icom IC-756Pro HF / 6m Trx £799.00
Icom IC-756ProII HF / 6m Trx £1150.00
Icom IC-R2 Wideband Receiver £89.00
Icom IC-R7000 £449.00
Icom IC-R7000 Mint Condition £550.00
Icom IC-R8500 Receiver £899.00
Icom IC-T7E Dual Band Handy £139.00
Icom IC-W31E Dual Bander £160.00
Kantronics KPC-3+ TNC £129.00
Kenwood AT-230 ATU £169.00
Kenwood AT-50 ATU £175.00
Kenwood MB-201 £20.00
Kenwood MC-50 Base Mic £60.00
Kenwood MC-60A £80.00
Kenwood MC-80 Base Mic £50.00
Kenwood PS-30 PSU £89.00
Kenwood PS-31 Power Supply £129.00
Kenwood PS-430 Power Supply £109.00
Kenwood R-5000 Receiver HF £450.00
Kenwood SP-430 Speaker £45.00
Kenwood TH-47E 430-440 MHz £79.00
Kenwood TH-G71E £139.00
Kenwood TH-K2E 2m Handie £99.00
Kenwood TL-922 HF Linear Amplifier £849.00
Kenwood TM-255E 2m Mobile £329.00
Kenwood TM-741E - VHF/UHF - TX/RX £275.00
Kenwood TM-G707E 2m/70cm FM Mobile Transceiver £159.00
Kenwood TM-V7E 2m/70cm FM Mobile Transceiver £250.00
Kenwood TR-251E 144-146 MHz £120.00
Kenwood TR-751E 2m Multi-mode Trx £299.00
Kenwood TR-9130 VHF transceiver £249.00
Kenwood TR-9500 70cms Multi-Mode Trx £220.00
Kenwood TS-140S HF Transceiver £299.00
Kenwood TS-2000 HF, 6m , 2m & 70cm Transceiver £999.00
Kenwood TS-271E £165.00
Kenwood TS-440SAT HF Transceiver £399.00
Kenwood TS-50 £399.00
Kenwood TS-570DG/E £675.00
Kenwood TS-680S HF / 6m £399.00
Kenwood TS-711E 2 Meter base £299.00
Kenwood TS-790E Dual-Band Base / Mobile Transceiver £799.00
Kenwood TS-830S HF Trx Base £349.00
Kenwood TS-850S /AT £699.00
Kenwood TS-870S HF Transceiver £899.00
Kenwood TS-940SAT £575.00
Kenwood TS-950SD HF Transceiver £1099.00
Kenwood TS850S HF £550.00
Kenwood VFO-230 external digital VFO £175.00
Kenwood VS-1 Voice Synthesiser £39.00
Kenwood YK-455C-1 CW filter for TS-140 £30.00
Kenwood YK-88C-1 500Hz CW Filter £40.00
KSC-14 Fast Charger for TH-22E £76.55
LDG AT-897 Autotuner £149.00
LDG Z-11 Auto-Tuner £89.00
Linear Amp Challenger II amplifier £1199.00
Lowe HF-225 HF receiver £275.00
M/Mods 144/100 £119.00
Magellan GPS 315 Receiver £129.00
Maldol Mr-2000 VHF/UHF SWR Power meter 50W and 200W £40.00
Maplin YN48C Dip Meter £49.00
MB-12M - Mobile Mounting bracket £10.00
MB-62 Mounting Bracket for IC-706 £12.72
MCL1100 EasyReader £59.00
MFJ-432 Voice Keyer, £99.00
MFJ-442 Elec + Memory keyer £89.00
MFJ-452 Super CW Keyboard £119.11
MFJ-452X CW Keyboard keyer with display and no keyboard £93.57
MFJ-781 DSP filter £89.00
MFJ-784 DSP Filter £149.00
MFJ-9015 15m cw Trx £84.26
MFJ-921 VHF 200 Watt ATU £50.00
MH-34B4B Speaker/Microphone £15.00
Microset PC2S 30 Power Supply £99.00
Microset PT 135 PSU £120.00
Microset R50 2m Amp £79.00
Mirage B-108 2m Linear Amplifier £129.00
MML432-30L £89.00
NEUMANN U 87 Ai condenser mic. £1100.00
Optoelectronics SCOUT RF Counter £199.00
OptoElectronics X Sweeper £1199.00
Palstar PS-30N PSU £75.00
PSR-282 GRE Handheld Scanner £76.55
PT-1012 Microset 12A 13.5 PSU £93.57
PT-50A Microset 50A 13.5V PSU £238.26
R-30CC HF PALSTAR HF Rx £399.96
Realistic Pro-2006 Scanner £129.00
Realistic Pro-43 Scanner £89.00
Rexon RL-501 Dual Band Handy £89.00
Sanyo DSB-WS1000 (Worldspace rx) £99.00
SEC-1223 SEC 23A 13.8V Switch Mode £85.06
SGC SG-230 Auto ATU £259.00
SMC 150PL Dummy Load £29.00
Snooper S5-R Safety Alert System £119.95
Standard C-156E 2m Handheld £125.00
Target HF3 HF3 RX £99.00
TH-K4E Kenwood FM 5W 70cm Handy (no keypad) £118.30
The Japan Radio Company JST-100 +PSU £399.00
Timewave DSP-59+ Filter £129.00
Timewave PK-12 Packet £99.00
Tokyo HY-Power HL-37VSX RF Power Amplifier with FET £69.00
Trident TRX-200 Scanner £149.00
Trio PS-430 Kenwood PSU £100.00
Trio TS-530SP £299.00
TSA-6602 - Quartz mini antenna tuner. (Rare) 144-430 £25.00
UBC-280XLT Handheld Scanner £109.00
UNIDEN UBC-3000 Hand Scanner £129.00
UT-86 (Spare) CTCSS Board £20.00
VX-150 Yaesu 2m FM - W/16-keys £75.00
VX-6E Yaesu 2m/70cm FM Dualba £144.84
Watson W-25AM Power Supply £75.00
Watson W-25SM 22A Power Supply £59.00
West Mountain Radio RigblasterPro £139.00
Yacht-Boy 1100 £79.00
Yaesu FC-20 Antenna Tuning Unit £169.00
Yaesu FC-700 ATU £99.00
Yaesu FC-757AT Auto ATU £169.00
Yaesu FP-707 PSU £110.00
Yaesu FP-757HD Power Supply £139.00
Yaesu FR-101 HF RX £399.00
Yaesu FRG-100 HF Receiver £299.00
Yaesu FRG-7700 HF Receiver £199.00
Yaesu FT-1000 HF Transceiver £1399.00
Yaesu FT-1000MP / AC HF Tx/Rx £899.00
Yaesu FT-1000MP Mark -V Field £1199.00
Yaesu FT-1500M 2m FM transceiver £109.00
Yaesu FT-1802E FM 2m Transceiver £89.00
Yaesu FT-2000 100W with internal power supply £1550.00
Yaesu FT-2500M VHF transceiver £99.00
Yaesu FT-2800M 2m FM transceiver £119.00
Yaesu FT-290Mkll 2m Trx £250.00
Yaesu FT-41R Handheld Trx/Rx £120.00
Yaesu FT-470R Dual Band Handy £129.00
Yaesu FT-50R Handy. £99.00
Yaesu FT-690R II 6m transceiver £275.00
Yaesu FT-726R VHF Base Trx £299.00
Yaesu FT-726R VHF/UHF Base Trx £399.00
Yaesu FT-736R 2m/70cm Base £499.00
Yaesu FT-736R 6m, 2m & 70cm £699.00
Yaesu FT-736R Multi-Band Transceiver+6m+23cms £899.00
Yaesu FT-757GX Mkl £275.00
Yaesu FT-757GXII HF Transceiver £329.00
Yaesu FT-767GX HF, 6m & 2m Trx £599.00
Yaesu FT-76R 70 cms Handheld Trx £99.00
Yaesu FT-790 £159.00
Yaesu FT-840 HF Transceiver £299.00
Yaesu FT-847 Multi-Band Trx £849.00
Yaesu FT-890AT HF Transceiver £425.00
Yaesu FT-900/AT HF Transceiver £475.00
Yaesu FT-920 £799.00
Yaesu FT-980 HF Transceiver £425.00
Yaesu FT-990 /AC £899.00
Yaesu FV-101DM Digital VFO £199.00
Yaesu FV-707DM DIGITAL VFO £99.00
Yaesu MD-1 Desktop Microphone £75.00
Yaesu MD-100 Desktop Microphone £79.00
Yaesu MD-200 Desktop Microphone £175.00
Yaesu SP-767 £69.00
Yaesu SP-901 Loudspeaker £40.00
Yaesu SP-980 Speaker £80.00
Yaesu VX-1R Dual Band Handy £85.00
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Carrying on the Practical Way

This month, the Rev. George Dobbs G3RJV is taking a look at 'Mr Hartley's Oscillator' and attempts to dispel some of the fear associated with building a stable variable frequency oscillator.

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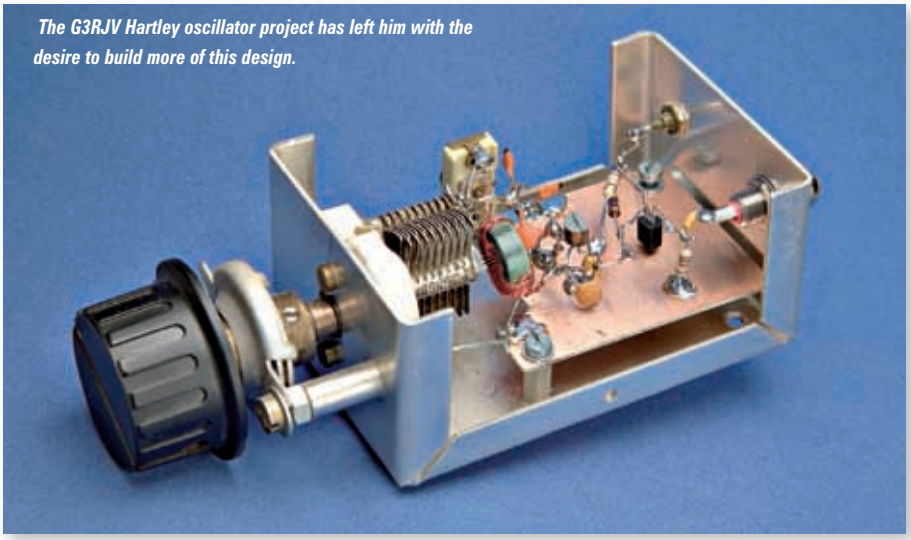
"Nothing is as simple as we hope it will be."
Jim Horning (Scientist and Writer)

The three words – variable frequency oscillator (v.f.o.) – can strike terror in the heart of some radio constructors. The v.f.o. can be a tricky beast. Building a free running oscillator that's stable in the lower megahertz frequency range does have its problems!

Experience over the years has taught me that building a frequency stable v.f.o. above (approximately) 10MHz is difficult but below that frequency it's a feasible undertaking for the amateur constructor. Oddly enough, it's as much about how it's built as what's built. Assuming that the design parameters are roughly correct, most published designs for a v.f.o. are capable of good results. The problems are more likely to be in choice of parts and the method of construction.



The G3RJV Hartley oscillator project has left him with the desire to build more of this design.

Good Rule

One good rule of thumb is to build the v.f.o. for an eternity of physical abuse. Using rigidly mounted components that cannot move within a sturdy metal case is a good way to proceed. If it can be hit with a mallet or dropped from a considerable height without any damage, the construction technique is good!

Many amateur constructors avoid the use of printed circuit boards (p.c.b.s) for a v.f.o. and use short point-to-point wiring. That approach fits well with the ugly construction techniques frequently used in this column. So, my advice is to solder it short and solder it firmly in place.

Careful choice of components in the frequency determining sections of a v.f.o. is important. The v.f.o. takes its frequency cue from the tuned circuit, an inductor with associated capacitors. Inductors can be prone to temperature variation frequency drift. Simple precautions against this include using air-wound coils or powdered iron toroidal cores of number 6 (yellow) mix. It's a good idea to use the thickest gauge of wire appropriate to the coil and in the case of toroidal cores, to occupy about two-thirds of the core.

Some constructors like to boil the completed winding in water for several minutes to anneal the copper. Coating the winding in polystyrene Q Dope can also help. I often add a coating of beeswax melted by the soldering iron tip.

Good quality capacitors, suitable for radio frequency (r.f.), should be used in tuned circuits. The main tuning capacitor should be of the best quality available. Air-spaced capacitors, preferably with back-lash free smooth bearings, are ideal.

Cheap, low-*Q*, trimmer capacitors should be avoided. Air-spaced trimmers are preferred if they can be obtained and the fixed capacitors must be temperature stable types.

Older constructors remember the excellent stability of silvered-mica capacitors, although these are expensive and aren't always easy to find. I have had good results with polystyrene capacitors but their spiral-like internal construction can make them suspect for high frequency use.

In more recent times, v.f.o. designers have advised the use of NPO capacitors. This type of ceramic capacitor is usually identified with a black marking on the top or it may be marked NPO or with the EIA (Electronic Industrial Association) marking

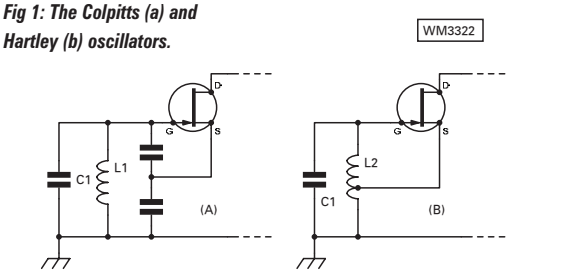
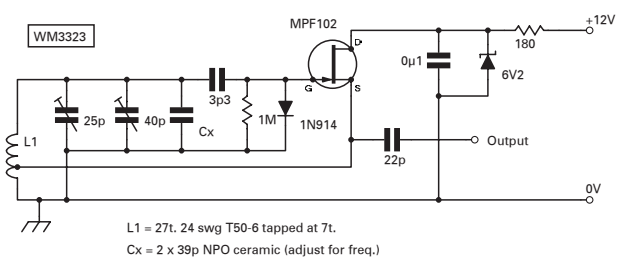


Fig 1: The Colpitts (a) and Hartley (b) oscillators.



L1 = 27t. 24 swg T50-6 tapped at 7t.
Cx = 2 x 39p NPO ceramic (adjust for freq.)

Fig. 2: The Hartley oscillator as built by G3RJV.

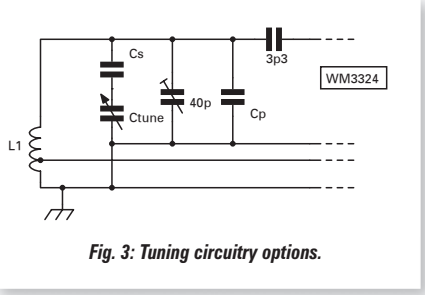


Fig. 3: Tuning circuitry options.

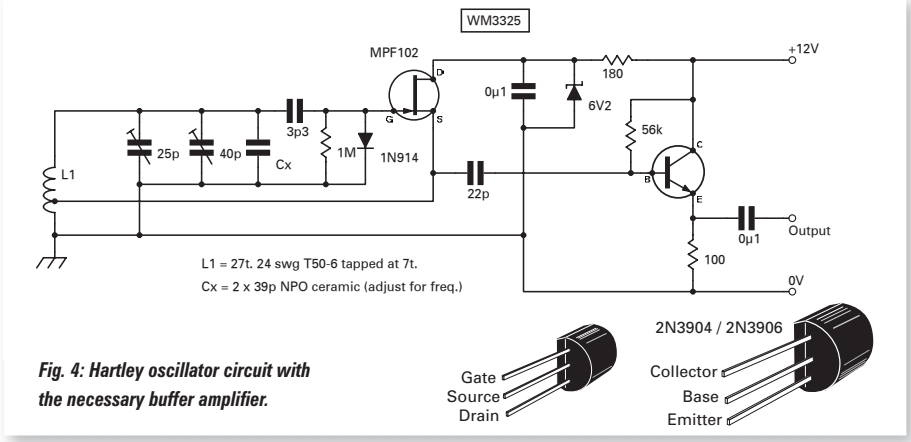


Fig. 4: Hartley oscillator circuit with the necessary buffer amplifier.

COG. The term NPO stands for Negative – Positive – Zero; the figure read as O is really a zero. This means that the positive and negative temperature coefficients of the capacitor are zero.

The NPO capacitors are well worth collecting and adding to the shack component stock. They tend to appear in lower values, mainly under about 150pF.

Hartley Instead Of Colpitts

Most of the v.f.o. circuits I have offered in this column have used the reliable Colpitts design. This is probably just habit on my part so, I thought I would offer readers another common type of v.f.o. circuit; the Hartley oscillator. The Hartley oscillator was conceived by **Ralph V. L. Hartley** when working for the Western Electric Company in 1915.

The difference between the Colpitts and Hartley oscillator is illustrated in **Fig. 1**. Each oscillator has an amplifier, a tuned circuit and a divider network to feed some of the output signal back to the input to maintain oscillation.

The Colpitts oscillator (1**a**) uses a capacitive divider network for the feedback, the amount of feedback determined by the capacitance ratio of the two capacitors. The frequency is controlled by the tuned circuit (C1 and L1).

On the other hand the Hartley oscillator (1**b**) uses inductive feedback. The capacitor C1 and inductor L2 form the tuned circuit. A tapping point on L2, a connection near the bottom of the inductor, introduce the feedback to the input. The amount of feedback is determined by the position of the tap.

The diagram, **Fig. 2**, shows the circuit of my test Hartley oscillator and I decided to build it for the 7MHz band. Readers will have to vary the values for other bands, although I would not advise attempting a v.f.o. over 10MHz.

The circuit roughly follows the design criteria in that fine book, *Experimental Methods in RF Design* by **Wes Hayward W7ZOI** and other writers. The amplifier section is an MPF102 f.e.t. device but other similar devices like the 2N3819 could also be used.

The circuit voltage is stabilised with a 6.2V zener diode. Other constructors may like to use a three terminal regulator chip like the 78L06 device. The diode at the gate of the f.e.t. is usually described as a clamping diode as it does not allow the gate to become more positive than about 0.6V. However, that doyen of Amateur Radio construction, Wes W7ZOI, says the primary function is as a detector to supply the f.e.t. with negative bias.

The frequency determining components are to the left of the circuit isolated by the 3.3pF series capacitor. The inductor is 27 turns of 24s.w.g. enamelled copper wire wound on a T50-6 core.

The winding is tapped at seven turns from the ground end of the winding. Although opinions seem to vary on the optimum tapping point for a Hartley oscillator, I've often seen a figure of 25% of the total winding quoted.

In reality, the best tapping point depends upon the frequency of the oscillator, the type of inductor used and the inductance/capacitance ratio of the tuned circuit. Everyone appears to agree that the tapping point requires enough turns to ensure reliable oscillation but not too many turns which could result in spurious oscillations.

I think that the best method for winding the coil, used in Fig. 2, is to begin at the grounded end. Wind on seven turns (using a toroidal former) and each pass of the wire through the core will represent one turn. At the seventh turn, pull out a loop of the wire about 30 or 40mm from the core.

Next, twist the loop until it is firm against the side of the core and scrape or burn off the enamel coating. Tin the twisted wire with a hot iron and plenty of solder to make the tapping connection. Add the required extra 20 turns and scrape and tin each end of the winding. To complete the inductor I suggest that you secure the turns with dope or beeswax.

The capacitors in the tuned circuit are made up of the main tuning capacitor (25pF), a trimmer capacitor (40pF) and a parallel padding capacitor (Cx). The value of Cx is determined by experimentation with the trimmer capacitor available for fine adjustment. I used NPO capacitors to make up the value of Cx.

A useful tip is to use several capacitors to achieve the desired frequency coverage. Several smaller value capacitors will be more temperature stable than one larger capacitor. For the circuit in Fig. 2, I found that two 390pF capacitors brought me close enough to the band for the trimmer to achieve 7MHz when the tuning capacitor was fully meshed.

Coverage To Suit

I was merely trying out a Hartley circuit at 7MHz and individual readers may want to make the coverage of the v.f.o. better suited for their use. My tuning capacitor gave far more range than I needed and adjustment was coarse. The diagram, **Fig. 3**, shows the tuned circuit options.

In addition to the tuning capacitor (Ctune) and the 40pF trimmer, I have shown the padding capacitor (Cp) and a capacitor (Cs) in series with the tuning capacitor. Begin experimenting with the required values by connecting tuning capacitor as in Fig. 2 (without Cs).

With Ctune fully meshed add NPO capacitors as Cp until the trimmer can pull the frequency to 7MHz. Rotate Ctune to check the frequency coverage. If this is too great, the value of Ctune can be reduce by adding some series capacitance (Cs). This will probably mean having to adjust Cp again and it's worth spending a little time on adjustment to achieve the require frequency coverage.

My practical implementation of Fig. 2 was somewhat careless, as I used an existing v.f.o. box with a variable capacitor complete with a reduction drive. Despite this the quickly built v.f.o. showed promise as short term drift was very acceptable and long term stability was excellent.

For practical use a v.f.o. requires a a buffer amplifier and I added a very simple buffer amplifier originally suggested by VK2ZAY, which I picked up from a source I have now forgotten. The circuit shown in **Fig. 4**, although simple, did the job well. The result was a v.f.o. with good stability and it left me with a desire to try Hartley oscillators more often! ●

VHF DXer

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David Butler G4ASR takes a look at Sporadic-E openings on the 50, 70 and 144MHz bands.

Another month of very wet weather throughout July was countered by some excellent Sporadic-E (Sp-E) propagation on the 50, 70 and 144MHz bands. The 50MHz band was open every day throughout the month, with the exception of July 12th, via single-hop and double-hop Sp-E paths across Europe and beyond. During this period, there were also 16 days of propagation over the Atlantic Ocean region to stations situated in North and South America.

The 70MHz band was in good shape with Sp-E openings on most days during July. Three countries; Germany (DL), Hungary (HA) and Italy (I) obtained authorisation, albeit temporarily, to use discrete segments of the band and this created a good deal of excitement for stations wanting to work new ones on the Four Metre band.

A number of operators active on the 144MHz band mentioned that E-layer ionisation was not very intense with only seven days of Sp-E openings being reported during July. Even so, some very good DX was worked on this band.

The 50MHz Band

I hope I haven't given the impression that it's only Sp-E propagation that occurs on the Six Metre band (50MHz). Right at the beginning of the month, on July 2nd, there was an Auroral-E (Au-Es) opening – and depending on where you were located – a simultaneous Auroral (Au) back-scatter event.

Unfortunately, the Au-Es opening was to a region with very few active stations other than beacon units. It's so annoying listening to the **VE4VHF** beacon (Canada EN19) over 6300km away and hearing no other operators! Similarly, other UK stations reported hearing the beacons **JX7SIX** (Jan Mayen IQ50), **OX3VHF** (Greenland GP60), **TF3SIX** (Iceland HP94) and **VE8BY** (Canada FP53) in the opening that started around 1230UTC and continued for over 10 hours before fading out around 2300UTC. The only active station reported to have worked into the UK was **TF3YH** (Iceland HP94), who was heard making c.w. contacts between 2100-2200UTC.

Another northern type opening occurred during the evening of July 11th with stations in England and Scotland hearing the **JW7SIX** beacon. Operational on 50.047MHz, JW7SIX is the World's northernmost Six Metre beacon, located right on the western coast of Svalbard. It's a group of islands lying in the Arctic Ocean north of mainland Europe, about mid-way between Norway and the North Pole.

Jonas Bjarnason TF2JB (Iceland HP94) has recently become active again having been QRT for almost 19 years. Between 1830-2100UTC on July 11th, he made a number of c.w. contacts with stations in northern England, Scotland and Wales. Located 60km north of the Arctic Circle, the club station of **OX2A** (Greenland GP47) was also worked during the evening of July 1th by stations in Scotland and northern England.

Sporadic-E propagation was prevalent throughout all of July, allowing stations, even those running low power and small antennas, to make c.w. and s.s.b. contacts with nearly every country in Europe.

The real DX contacts, however, were made over the transatlantic path to stations in North and South America. Such multi-hop propagation sessions were reported on 16 days during July. Contacts were made into the W1, W2, W3, W4, W8 and W9 call areas of the USA and VE1, VO1 call areas in Canada.

Other DX stations worked over this path included those of FM5AA (Martinique), FY1FL (French Guiana), HI3TEJ (Dominican Republic), J79PAK (Dominica), J8/W6JKV (St. Vincent), KP2A and KP2BH (Virgin Islands), KP4EIT, KP4SQ, NP4A, WP3UX, WP4AZT and WP4NIX (Puerto Rico), P43JB (Aruba), PJ2BVU (Netherlands Antilles), V44KAI (St. Kitts & Nevis), YV4DYJ (Venezuela) and 9Z4BM (Trinidad & Tobago).

The 70MHz Band

Last month, I mentioned that a few national societies are making good progress in obtaining temporary allocations within the 70MHz band. At the beginning of June, came the good news that Portuguese (CT) stations had been granted access for a further three month period and the Norwegian station LC0VHF had obtained a three day permit for use on 70.150MHz during the Nordic VHF Meeting.

Unfortunately, both permits mentioned have now come to an end but at least the respective authorities are now aware of the Four Metre band allocations within Europe. Although CT and LA activity has come to an end it was good to hear the news in July that three other countries, Germany (DL), Hungary (HA) and Italy (I) had been granted temporary allocations within the 70MHz band.

A temporary 70MHz allocation in Germany came as a complete surprise to me but according to **Joe Kraft DL8HCZ (**CT1HZE) the experimental station of **DI2AL** has been licensed by the German telecoms regulator **BNetzA** for a three month period from July to September 2007. This unique permit allows DI2AL to transmit on 69.995MHz ±1.4kHz and listening on either 70.100 or 70.175MHz.

The 70MHz station operated by DL8HCZ has been arranged to commemorate the 50th anniversary of the International Geophysical Year (IGY) 1957. The first UK stations known to have made contact with DI2AL were GM4ISM at 1023UTC and MW0HMV at 1030UTC on August 7th.

On June 29, an experimental radio licence was issued that permitted radio usage of the 70MHz band for a total of 30 Hungarian Radio Amateurs for a period of 30 days commencing on July 1st, 2007. The aim of the experiment was to study propagation of radio waves in the 70MHz band where all Hungarian f.m. broadcasting came to an end in February.

The frequency range permitted for the experiment was 70.000 - 70.500MHz and the licence was valid for all operating modes with a maximum effective radiated power (e.r.p.) limited to 1kW. In the experiment the stations had to identify themselves with a 'call name' rather than an internationally recognised callsign. The call name was composed by a prefix '70M' and a suffix consisting of Amateur Radio callsign. For example, the Budapest Radio Club HA5KDR used the call name 70M5KDR. The long term aim of the Hungarian Society MRASZ is to obtain a permanent 70MHz allocation for the Amateur Radio service in Hungary.

During July, the stations of HA1FV (JN87), HA1XJ (JN86), HA1YA (JN87), HA5PT (JN97), HA8BR (KN06) and HA8MV (KN06), all using the appropriate 70M-

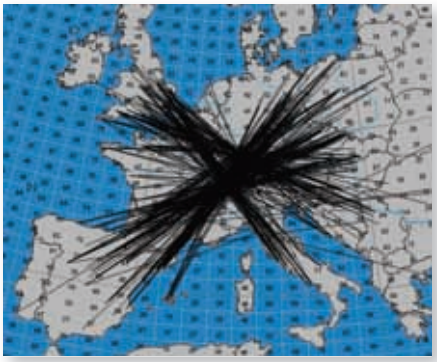

Fig. 1: The 144MHz Sporadic-E opening July 14th, 2007.

The DF0TAU Field Day Station.

prefixes, were known to have made c.w. and s.s.b. QSOs with UK stations. The beacon station 70M1BVC (JN87), operating on 70.012MHz, was also received in the UK on many days throughout July.

Following a request from **Luca Ferrara IK0YYY**, the Italian Ministry of Communications authorised Amateur Radio experiments to be carried out in the 70MHz band within the period July 11th to December 31st, 2007. All communication modes could be used in 25kHz frequency slots centred on 70.100, 70.200 and 70.300MHz with a maximum r.f. power of 25W (e.r.p.) using omni-directional or directional antennas. The operational areas included all Italian territories with the exception of a 30km wide strip alongside the borders of Austria (OE), France (F) and Switzerland (HB).

Stations in all UK call areas reported making c.w., f.m. and s.s.b. contacts during July with the Italian stations of; I0JX, I0QM, I0WTD, I2KBE, I5CTE, I7CSB, IK0FTA, IK0YYY, IK5MEJ, IW0FFK, IZ0AEG and IZ5EME. A huge surprise for many operators was the station of **1A0KM** (JN61) who was heard on July 18th and July 21st operating on 70.200MHz. This callsign operates from a building in Rome and is the headquarters of the **Sovereign Military Order of Malta** (SMOM).

Surprisingly, the Sovereign Military Order of Malta is a sovereign entity according to international law, a country without territory. Therefore, 1A0KM counts as a DXCC country and is very rare indeed, especially on the 70MHz band. Some of the UK stations known to have contacted 1A0KM include G3VYF (JO01), G4CBW (IO83), GI4KSO (IO64), GM4FAM (IO77) and GW8ASD (IO83).

The 70MHz band was open for long distance contacts via Sp-E and meteor scatter (m.s.) every day throughout July. This created considerable excitement, even for those stations with low-power frequency modulation (f.m.) equipment. Operators in the UK reported making QSOs with many stations during the period that included CT1BXT (Portugal IM59), CT3HF (Madeira Island IM12), CU8AO (Azores HM49), EI75IRTS (Ireland IO63), GB5FI (Flatholm Island IO81), GD0TEP (Isle of Man IO74). Also active were GI0RQK/P (Northern Ireland IO74), GJ7DNI (Jersey IN89), GM3TAL/P (Scotland IO75), GU8FBO (Guernsey IN89), MW0CUA (Wales IO71), LX1JX (Luxembourg JO30), OY/G4ODA (Faroe Islands IP61), OZ7IS (Denmark JO65), SV4AAQ (Greece KM19), S59MA (Slovenia JN76), ZB3B (Gibraltar IM76), 5Q3X (Denmark JO54) and 9A3SA (Croatia JN95). It's good to see so much activity on Four!

The 144MHz Band

The first 144MHz Sp-E opening of this summer season was reported on May 13th to EB6ADS (Menorca JM29) and EA6VQ (Majorca JM19) followed by further Mediterranean openings on May 27th to F1MJC (France JN06) & EA6VQ and on May 28th to EA3JT (Spain JN01), IK7HIN (Italy JN81) and 9H1ET (Malta JM75).

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. Some choice DX was worked in the opening on June 2nd between 1415-1620UTC with s.s.b. contacts being made into Bulgaria, Italy and the stations of SV1BTR, SV2JL, SV3BEF, SV3GSE/M and SV8CS (Greece). Between 1820-1900UTC UK stations reported QSOs into Poland, Romania, US2YW, UT3BW, US5WU, UX5NW and UY5OE in Ukraine and ER1SS in Moldova.

Other good DX openings during the month, included Portugal (CT) and Morocco (CN8KD) on June 5th, CN8IG, SV1OE, SV2JL, EA8TX (Canary Islands), EA9HA & EA9MH (Ceuta & Melilla) on June 6, Austria, Croatia, Hungary, Slovakia (OM) and Slovenia on June 9th and Ceuta & Melilla and Morocco on June 13th.

There were four openings on June 14th, the first around 0700UTC to LZ1ZP, the second between 1105-1135UTC to SV3CYM, the next between 1250-1335UTC to SV3GKE/3, Croatia & Italy and the final event between 1525-1535UTC to stations in Corsica (TK5JJ), Sicily (IS0GQX) and Italy. Further Sp-E openings on the 144MHz band during June included s.s.b. contacts with the stations of CN8ET, CN8LI, CN8SG, SV8CS, 9H1AW, 9H1ET, 9H1JJ, 9H1TX, 9H5DR and 9H5L (Malta).

Conditions deteriorated somewhat during the following month with only seven events being reported on July 4th, 6th, 8th, 9th, 14th, 15th and 24th. The openings at the beginning of the month were quite brief lasting 15 minutes on July 4th to UT5JCW (Ukraine) and YO8ROO (Romania) and 30 minutes on both July 6th and 8th to stations in Portugal and Spain.

Another southerly opening was reported on July 9th between 1545-1730UTC to stations in CT, EA and EA6. Between 1620-1705UTC the E-layer propagation extended to the stations of EA8BEX (IL27), EA8CCG (IL18) and EA8TX (IL18), all situated within the Canary Islands, off the north-western coast of Africa. Best DX of the afternoon was an s.s.b. contact on 144MHz between the stations of G8GXP (IO93) and EA8BEX at 3077km.

Another Sp-E opening occurred on July 14th between 1700-1815UTC to stations in Austria (OE), Bosnia (T9), Croatia (9A), Greece (SV2JL), Hungary (HA), Italy (I), Romania (YO), Serbia (YU7) and Slovenia (S5). During this opening, depicted in the diagram**, Fig. 1**, the rare DXCC station **1A0KM** appeared on 144.305MHz making s.s.b. contacts with many UK stations that included G0CUZ, G0FYD, G0JJG, G4EAT, G4HGI, G4KWQ, G8GXP and M0IKB.

An unusual 144MHz opening to north-western Europe was reported between 1635-1750UTC on July 15th. The band was open to OH1ND (KP00) and OH6MAZ (KP21) in Finland, SM0DFP (JP90), SK2AT (KP03), SM2CEW (KP15) and SM2CKR (KP03) in Sweden and RA1AY (KP50) & RX1AS (KO59) in Russia. Best DX of the event appears to be that between the stations of G4LOH (Cornwall IO70) and RX1AS over a 2453km path.

An interesting 144MHz opening was reported on July 24th that occurred between 1645-1750UTC. Operators in southern England made 144MHz s.s.b. contacts with stations in Bosnia, Bulgaria, Croatia, Greece (SV2JL), Macedonia (Z35F), Romania and Serbia. Two stations in Turkey, TA1AB and TA1H, were also contacted on 145.500MHz the f.m. calling channel by stations in south-eastern England.

Deadlines

That's it for this month. 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

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This month, Carl GW0VSW looks at the origins of the term 73, rounds-up your reports and looks back to h.f. operating in the 1920s.

You are all familiar with the term 73, which usually ends a QSO. But have you ever thought "where does the number originate from and why?" In fact, the number can be traced right back to the first telegraph systems and can be found in some of the earliest editions of the number codes available at that time.

The definitions vary but they all end up meaning the same thing and usually indicated that the end or signature was coming up. The first authentic use of 73 appeared in the *The National Telegraph Review and Operators Guide,* which was first published as early as April 1857. At that time, the number 73 meant "My love to you" and subsequent issues of this guide continued to use this definition.

In the *National Telegraph Convention* the numeral was changed to become more of a greeting or friendly word between operators and this is what was used by most telegraphy operators. In 1859, the **Western Union Company** set up the standard 92 code, which contained a list of numerals from 1 to 92 and was used to indicate a series of set phrases for use by all operators on the company's wires.

In the 92 code, 73 was changed to a more formal "accept my compliments" and from the mid-1800s to early 1900s many of the telegraphy manuals show variations of this. Some even list it as just meaning "compliments".

The Twentieth Century Manual of Railway and Commercial Telegraphy listed two meanings, the first, "my compliments to you" and the second. once again as "compliments". It's the 1908 edition of the *Dodge Manual* that finally lists today's definition as "best regards". There is no doubt that 73 is as a friendly way to end a QSO and long may it continue!

Database for QSLing

It's sometimes very difficult to obtain the QSL information of a DX or Special Event station that you have worked, especially when there is a huge pile-up! One site that could be of help to you is the QSL Database run by **Boye Christensen OZ7C,** which contains over 403,974 unique callsign records. The package can be downloaded at **www.ddxg.dk/oz7c/** or you can use the web based search machine found at **www.qsl.dk/oz7c** to try and locate the callsign or manager you need.

Market Reef

There are some interesting photographs and video clips available now from a recent operation in July to Market Reef EU-053 in the Baltic Sea by **SM0BSO, SM0LQB, SM1TDE, SM0EPO** and **OH0RJ.** They can be found at **www.sm0lqb.se/OJ0/** (The site is well worth a look).

DX News

On to some DX news now and an IOTA operation from Papua New Guinea, which will take place this month. Using the call **P29VCX** a team will operate from Nukumanu Island OC-284, a new island to be activated on September 23rd to 29th and from Takuu Island OC-283, another new one, as **P29NI** from September 30th to October 5th. The team may also operate from the Tulun Islands OC-256 on October 6th to 9th, though the callsign had yet to be decided as I put the column together.

Activity can be expected on all h.f. bands including evening operations on 1.8 and 3.5MHz. They will have three stations with them including two amplifiers, some verticals and a multi-band dipole. You can QSL P29VCX via SM6CVX and P29NI via G3KHZ.

On to the Maldives, a group of 26 atolls or ocean reefs in the Indian Ocean. **Andrew Kitchen G7COD** will be active here for a third time as **8Q7AK** on Embudu Island AS-013 between the September 30th and October 12th . Activity will be mainly s.s.b. although there is the possibility of a little c.w. on the 10, 14, 18, 21 and 24MHz bands. The suggested frequencies to look out for are 14.147, 18.133, 21.253 and 24.953MHz ± 10kHz to allow for any QRM).

Andrew will operate every day from 0830-1030 and 1300-1515UTC using an Icom IC-7000, 100W output to a full-size G5RV suspended at the top of the coconut palms approx 10m (30ft) high. The QSL route is either via the bureau or direct to **G7COD Cottage 4, Newton Hall Farm, Bank Newton, Skipton, North Yorkshire BD23 3NT** and more detailed information can be found under 8Q7AK on **QRZ.com**

The Scouting celebrations continue with the special event station **SX100VAR** in Greece, which will be active until the end of the year. This Scout station celebrates the 100th anniversary of the International Scout Movement and it will be active from the Scout head office (**KM18XF**) in the Varnava area (North East of Athens) on all bands using both s.s.b. and RTTY. There will be an award for Radio Amateurs who make a contact or s.w.l.s for hearing the callsign on any band and using any mode. More details of the event, a picture of the award and QSL information is available on **www.qrz.com/**

Pirate Operations Again

Following on from last month's item on the pirating of **Monk Apollo's** callsign, **SV2ASP/2**, it appears that he is not alone. In San Marino, **Tony T77C** reports that the station signing **T77BL** on SSTV between May 15th and June 29th and PSK31 between June 28th and July 7th was a pirate, as the genuine T77BL does not operate using these modes. So check your logs before you send a card.

Another pirate station (according to **Mamuka 4L2M)**, who is President of the National Association Radio Amateurs of Georgia (NARG), is **4L6VV** who gives his name as Yuri and his QTH as Tkvarcheli. This is not a Georgian licence and they believe the pirate is actually operating from somewhere in Russia. Mamuka asks that you do not QSL to this operation.

Your Reports

I begin your reports this month, with 3.5MHz and **Eric Masters G0KRT** in Worcester Park, Surrey who spent some time in the Original QRP Contest and despite some very poor band conditions managed several two-way QRP contacts, including SM/DJ9IE (Germany) 2120, LX/OP5R (Luxembourg) 2142, I1BAY (Italy) 2150, S52P (Slovenia) 2207 and ON6MG (Belgium) at 2232UTC using a Yaesu FT-817 and 5W to a W3EDP antenna

On the 7MHz band, **Martin Addison 2E0MCA** in East Finchley, North London used his Yaesu FT-840 with a Heil Pro-set Plus microphone and a folded half-size G5RV to work s.s.b. calls 7X5ST (Algeria) 0532, LA7YX (Norway) 0635, F5VBY (France) 0702 and HG200B (Hungary) as special call for the anniversary of the first Hungarian president at 0708UTC.

Back in Surrey, Eric G0KRT used c.w.

once again finding QRP stations I2AZ (Italy) 0526, OK2QX (Czech Republic) 0535, DF4FA (Germany) 0914, LX/OP5R (Luxembourg) 0931 and F8UFT (France) at 1251UTC.

The 10 & 14MHz Bands

Ted Trowell G2HKU on the Isle of Sheppy has kept his operating to a minimum this month but did find time to log on 10MHz OY3QN (Faroe Islands) EU-018 at 0900 and later, ZB2FK (Gibraltar) and FY5FY (French Guiana) around 2100UTC using c.w. and a Ten-Tec Omni V and 100W to a G5RV antenna.

On 14MHz, **Martyn Medcalf M3VAM** in Chelmsford, Essex worked s.s.b. stations RF3A (European Russia) 1240, 9A5BS (Croatia) 1637, ER3ZW (Moldovia) 1714 and US0LW (Ukraine) at 2019 using his Icom IC-746 at 10W to a half-size G5RV with SGC-237 automatic antenna tuning unit (a.a.t.u.)

In Biggleswade, Bedfordshire **Owen Williams G0PHY** used his Yaesu FT-747 and 100W to an inverted L antenna to work EJ/M0HSW (Ireland) on EU-121 at 1028 and 7U5CI (Algeria) at 1542, while later HB0/DK8OM/P in Liechtenstein was worked at 1620UTC.

Preferring the digital modes again, is reporter **Lee Carberry M0HOK** in Stockton-on-Tees who uses a Yaesu FT-817ND with a simple dipole cut for the band but only 3m off the ground. Using BPSK31, Lee found PS7DX (Brazil) and OX3DB (Greenland) NA-018 with just 5W. Lee has also been investigating 136kHz while monitoring his friend Rob M0DTS' beacon and 500kHz where he managed to copy a couple of stations using just a random wire and inductor!

Vince Lear ZL1VL (Ex G3TKN) recently visited Australia where he met up with **Alan Gibbs VK6PG** (Ex G3PHG) in Perth. Alan runs a Cushcraft A4S 3-element tri-bander with a very robust tower and usually operates on the 14MHz band using c.w. from an Icom IC-756Pro and a KW1000 linear amplifier. He also enjoys restoring vintage equipment and two fine examples of an HRO and a BC348 and is currently restoring an old Second World War spy set. Back to East Finchley and Martin 2E0MCA who listed SY8WT (Greece) on the island of Skyros EU-060 at 0617, 4O3DX (Montenegro) 0632, EA5/ON4LO/P (Spain), UE1OKI (European Russia). At 0704 he worked, S51GL (Slovenia) 0746, 1A0KM (Sovereign Military Order of Malta) EU-023 at 0919, F5JYD/P (France) 0927, CT/GW0VML/P (Portugal) Ian operating from the most westerly point of mainland Europe. At 1103he worked DL7UCW (Germany) 1300, HB0/DL1ARS (Liechtenstein) 1530, SX5RHO (Dodecanese) EU-001 with a special call for the Rhodes Games at 1642, SV9CVY (Crete) EU-015 at 1815, LZ1YG (Bulgaria) 1857 and UY2UA (Ukraine) at 1949UTC.

A photo of Vince Lear ZL1VL at the base of the substantial tower belonging to Alan VK6PG.

The 18 & 21MHz Bands

On 18MHz, Owen G2PHY was pleased to catch 9XVB (Rwanda) at 1813UTC after only a few calls with s.s.b and 100W to a dipole. Ted G2HKU lists c.w. stations VQ9TC (Chagos) AF-006 at 1510 and later around 1900UTC 7Q7BP (Malawi), ZP6CW (Paraguay) and PR7AR (Brazil) were logged, although static levels were very high making operating difficult!

Signing Off

Well that's about it for another month. Even though the bands have been described as "extremely poor" by most reporters there has been plenty of activity around and even some long distance propagation. The higher bands seem to have been dead for most of the time and **Denzil Evans GW3CDP** in Skewen, South Wales has said the band conditions are some of the worst he has known in over 60 years of operating!

Thanks to all those reporters who sent in their logbooks and also to **Mauro Pregliasco I1JQJ** and **Valeria Pregliasco IK1ADH** editors of the *425 DX News* Bulletin and **Tedd Mirgliotta KB8NW** editor of the *Ohio/Penn DX Bulletin* for all the DX information. Until next time, have a good DX-filled month.

73, Carl GW0VSW

75 Years Celebrations History of h.f. operating during the 1920s

1920 – After the First World War there was growing concern throughout Europe and the United States that Amateur Radio stations would not be allowed to return to the airwaves. In the early 1920s, restrictions began to be lifted and control of the broadcast and Amateur bands slowly returned to civilian control.

The next few years would see enormous advances in transmitter design as Amateurs began to use vacuum tube (valve) technology in their equipment allowing huge increases in reliability and range on the shortwave bands. The *Radio Amateurs Callbook* (*RAC*, Flying Horse) is published and the first International QSL bureaus are established.

1923 – A patent was granted for a new mode called Single Side Band (s.s.b.) and on November 23rd, **Leon Deloy 8AB** of Nice, France worked American stations Fred Schnell 1MO in Connecticut and **John Reinartz 1QP/1XAL** on 110m c.w., a distance of over 4000 miles and the best DX for that time!

1924 – American Amateurs get new bands at 3.5, 7 and 14MHz and 'Spark' equipment is prohibited on these new bands. The ARRL decides to adopt Esperanto as the international 'auxiliary' language. On October 18th, **Cecil Goyder G2SZ** worked a New Zealand station **Frank Bell Z4AA**, a distance of almost 12,000 miles.
A **Mr H. S. Shaw** introduced the Amateur Radio community to quartz crystal control of radio transmitters and Radio Amateurs became the first sizeable commercial market for these.

1925 – The International Amateur Radio Union (IARU) is formed and Amateurs around the world begin to communicate with each other regularly on the short wave bands. Heater type vacuum tubes (valves) made possible the first all-electric receivers and Dynamic loudspeakers appeared for the first time.

1927 – The International Radiotelegraph Conference was held in Washington and representatives from 70 nationalities attended. It was here that the international prefixes we use today were decided. Interestingly MHz frequency allocations were under pressure even then and the IARU and ARRL battled enormous odds to keep the 1.8, 3.5, 7 and 14MHz bands. They even managed to add 28MHz to the list. However, nearly 37% of the frequencies in use at the time were lost to Amateurs.

1928 – As the transmitting range of Amateur stations increased, Amateurs began to work stations over greater distances (DX) and it became necessary to use the international callsigns set the year before. This callsign structure was to last until the late1930s. The ARRL sponsors what was no doubt the first organised contest called
The 1928 International Relay party.

In Vision

Graham Hankins G8EMX
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Birmingham B27 7NA
E-mail: g8emx@tiscali.co.uk

Graham G8EMX rounds up the latest ATV news. This time he also looks back to the 1900s.

I think it's about 10 years since I took over the writing of In Vision from **Andy Emmerson G8PTH** (who wrote under the original title, Focal Point); I still have a print out of my sub-edited copy written for the April 1996 issue, so now I always mention Amateur Television in full at the start of every column! Anyway, the only real reason I mention this timescale is that, over the years, I have received a few responses to the ATV page from readers.

I emphasise 'a few' because that is what it has been – two or three a year maybe. The fact that it has been a few, rather than many, is, of course, not an issue – most have been very short and generally express thanks for the page. Even the longer ones have been complimentary but wishing to ask the occasional question. As a statistic, if the only feedback is that of a compliment, there might be many other happy souls who just have not actually E-mailed!

However, two E-mails I've received in recent months contained a bit more 'meat' and were prompted by the August column. I mentioned that the February issue of the **British Amateur TV Club**'s magazine *CQ-TV* had no advertisements for transmitters, receivers or antennas. **Chris** and **Mandy Wilson (M0YZA** and **M0MDY**) were "quite shocked to hear that *CQ-TV* magazine had no advertisements for such equipment." Chris had built some ATV gear to successfully access the Lincoln repeater and went on to list some websites where ATV hardware could be ordered over the Internet.

It's true that *CQ-TV* used to contain several adverts. There was an ATV group supplying antennas, years back another group supplied a – very successful at the time – transmitter kit, an individual had a page in the magazine filled with a 24cm (1.3GHz) receiver and pre-amp plus 10GHz kits. Another in Tamworth advertised 24cm and 3cm antennas. None of these adverts have appeared lately.

It's inevitably the case that advertising costs money, even in a voluntary magazine. Also, the equipment I've mentioned was coming from private individuals supplying their hobby. Deciding to pay to advertise depends on the advertisers' perception of response and results and volunteers move on or change circumstances.

In the case of receivers, I understand that one major issue for supplying the hobby market is the difficulty of an individual obtaining small quantities, for example – a few hundred off. Many suppliers to the world market will only talk tens of thousands or even millions off. And may not even talk to a private individual at all!

However, if any supplier of satellite TV tuners **is** willing to supply in small quantities to an individual, please make yourself known, to me in the first instance. The Editor of *CQ-TV,* **Brian Kelly GW6BWX** and the BATC's Advertising Manager, **Trevor Brown G8CJS**, who is also the club's chairman are always seeking new advertisers or keeping in touch with previous ones. But the final decision to place an advert always lies with the vendor, of course.

New Blood

The second E-mail was, perhaps, the longest I have received as a result of In Vision and it expressed some concerns, not confined to In Vision, but relevant to wider Amateur Radio too. Sent from the Wendy Evans mailbox (but signed **Mike M3EMB**, so I shall refer to Mike) the mail opened with: "Hi Graham, I do read In Vision in *PW* with lukewarm interest because I am a 65 year old M3, I look down at the callsigns and quite honestly I am absolutely fed up with seeing G calls mostly of the lower numbers, where are the M3s and the 2EOs the new blood?"

Well Mike, the same question is sometimes asked of Amateur Radio generally. With ATV, yes it is a question I often ask; logically, television ought to appeal to a younger audience more than radio and I think that is certainly the case in broadcasting. But in our hobby perhaps the younger Radio Amateur is not prepared to do the building that is needed in ATV? Or perhaps they expect an instant result – a contact will usually be assured somewhere on the h.f. bands but this is certainly not so with ATV.

For In Vision, I receive very few reports from ATV operators at all, let alone any younger operators and it is maybe a symptom of the times. Even if I ask an individual or correspondent to send me something for the page, it very rarely happens.

Mike's Email continued with general comments about the perception of and attitude towards M3s from some G stations, then ended: "So, Graham think of the 6,000 or more M3s out there, probably about 2,000 2EOs and all the other upgraded G6s who could put new life into ATV. Give us your guiding hand for a few months, in your column in *PW*. "It would be nice to read *if there are any M3s out there thinking of starting up an ATV station and working through their local repeater and this is what they should do*."

To give Mike a quick result, this is what newcomers to the ATV scene should do. First, become familiar with the basic technical make-up of the video signal. the waveform that comes out of a camcorder) look at it on an oscilloscope and read a book of basic TV theory. Then get in touch with the local ATV repeater group – the *RSGB Yearbook* lists them all. Or listen out on the 2m ATV calling frequency of 144.750MHz. As pointed out earlier, hardware is now a bit of an issue, you will need at least an ATV receiver and analogue satellite boxes are sometimes in short supply, but an existing ATV operator in the repeater group may have one (or several!) spare. So get yourself looking at your local repeater, I'll cover accessing it next time and including this topic more fully in future 'In Vision' pages.

Graham G8EMX

75 Years Celebration

Looking Back – 1910 to 1919

Even before **John Logie Baird**'s low-definition Nipkow Disc mechanical television system, an electronic basis of producing television had been described in a 1908 letter to the science magazine *Nature*. The author, another Scottish engineer, was **Alan Archibald** (A.A.) **Campbell-Swinton** and in 1911 he expanded on his ideas for an electronic television system in his presidential lecture to the Röntgen Society of London. Cathode ray tubes had been invented and Campbell-Swinton even proposed a system of scanning to draw a moving image. By 1915, Campbell-Swinton's television system was featured in Hugo Gernsback's *Electrical Experimenter* magazine.

So, why use the Nipkow mechanical disc? Having an idea was one thing but Cambell-Swinton's descriptions lacked key details so neither he nor his contemporaries knew exactly how to make this electronic system work. The way was, therefore temporarily open for a simple mechanical device which, although producing only rudimentary results, did produce a true electrically transmitted image.

Introduction

The 1920s – the time before *Practical Wireless*

The Editor, Rob Mannion G3XFD, introduces this month's very special historical section, as he pays special tribute to Charles Miller the Editor of *The Radiophile* magazine and to some of the pioneering 'characters' in hobby radio publishing.

This month, we have the first of some extremely special – I don't hesitate to use the term unique – articles that help us understand and enjoy the publishing side of hobby radio in the 1920s and up to 1932. When Charles Millers' articles arrived in the *PW* offices – I realised just how fascinating the early days of hobby radio publishing were!

I often get an insight into just how seriously our hobby was taken in the 1920s and 1930s. Meeting elderly radio enthusiasts during my visits to radio clubs, I never fail to be impressed when the real old timers tell me how they made individual resistors, capacitors and (perhaps most striking of all) variable 'condensers'.

However, behind the efforts of the keen early radio hobbyists were the specialised publishers and journalists busily producing the constant flow of simple, but often innovative projects for their readers. And let's face it – for the vast majority of the constructors it would most likely be the first time they'd ever handled electrical components.

Keen Writers

Without exception – as Charles Miller makes very clear in his superb article – all the keen writers working for the hobby radio market were totally dedicated to their jobs. It's also obvious from the article that some of the pioneering journalists weren't really fully appreciated by their publishers. There were exceptions of course and these included **Fred Camm** (FC) and **John Scott-Taggart** (JS-T), the wunderkind himself!

Many years ago in *PW,* Charles Miller writing in his Valve & Vintage column, provided an illustration of JS-T posed with one of his projects, with a number of admirers. The photograph was striking and as someone who has fond memories of his own Labrador, the illustration of JS-T and his admirers reminded me of the unbounded admiring attention I received from Mandy, my own much-missed dog!

Fallen Idols

Nowadays, I think there's an interesting parallel in the way the much admired (almost idolised) technical journalists of the 1920s and 1930s can be compared with the personality cult that the media has developed around professional sportsmen and sportswomen.

However, although most of the early radio technology 'idols' didn't fall from grace in the spectacular fashion as some modern sports personalities (with the possible exception of the BBC's Captain Eckersley), the specialist's reputation itself could end up slightly dented!

Fred Camm himself was known to be (for reasons I've speculated on in *PW* recently) to be grumpy and autocratic and I have had personal experience of the late **Austin Forsythe G6FO** when I entered the old *Short Wave Magazine* offices in London during the lunch hour (it was typical of me to arrive just at the wrong time!) The angry shouts from the end of the long dark corridor left me in no doubt when I should return!

One of the most enjoyable experiences during my club visits is when someone recalls memories of the past involving *PW* or radio hobby personalities. One of the most amusing of these delightful incidents took place at a radio club in Eastbourne, East Sussex a few years ago.

The room was well filled with club members and visitors awaiting my talk and just before I started, someone tipped me off that I was likely to be interrupted by someone with special memories of JS-T! Intrigued, I started the talk on the early days of *PW* and I wasn't disappointed when I was interrupted!

The interjection started at the point where I talking about the original pioneering *PW* authors and as soon as I mentioned JS-T, an elderly man at the back of the audience stood up. As he shared his delightful story he – rather oddly – held his arms as though he was hugging a telegraph pole!

Fascinated by our friend's wartime experience, I sat down and listened (I learn a lot this way). He went on to explain that he was Squadron Leader John Scott-Taggart's RAF 'Erk' (basically a general purpose RAF serviceman!) and that when they were calibrating the CH radar system at Dover that he (the Erk) was up at over 200ft on a mast with a calibration antenna and heavy coaxial cable when JS-T was invited to the Officer's mess for a drink. His curled arms were to indicate he still suffered after being left up the mast overnight many years before (having been told to stay aloft until called down) and, of course, the story was much enjoyed by everyone present.

No doubt there'll be stories told about me in the future – although I have no pretensions to grandeur! However, I was brought down to earth with a bump at a club in County Durham some years ago. I had just arrived – after an almost 300 mile drive – when an elderly gentlemen (with no hint of a smile on his face) greeted me in a gruff, broad County Durham accent. "Aa've just cycled 12 miles to hear your talk young man", and continued, "Aah just hope it's worth it!'

Rather taken aback I earnestly replied, "I've just driven almost 300 miles to give the talk and I hope you do enjoy it!'

The old chap (he had a G3 two letter call) then turned away without a flicker of a smile. When the meeting finished he approached me and I bravely asked if he enjoyed it and asked, "Was it worth a 12 mile cycle ride?'

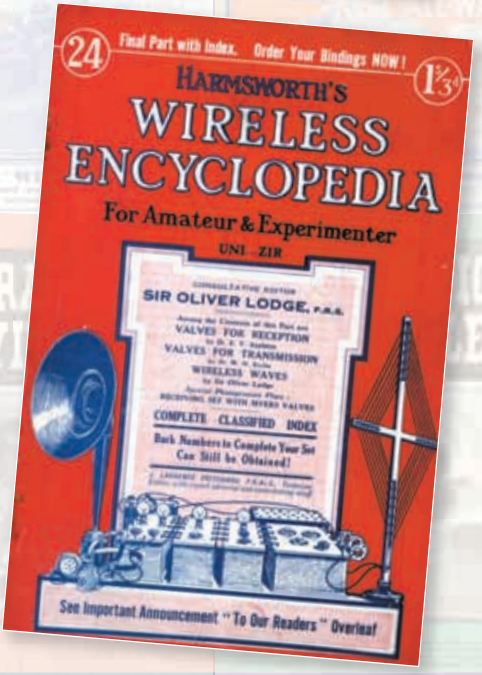
An hour's (it seemed that long!) silence followed before he replied, "Yes, Aaaah thought it was worth a good nine miles!"

Such stories help me to keep my un-godlike size 15 shoes on the ground and to this day, I still don't know if my leg was being pulled!

Rob Mannion G3XFD

Practically Yours

75 years of Heritage & History



1920 – 1929

Hobby Wireless Publishing before 1932
Charles Miller provides a fascinating insight to the world of hobby wireless magazines before the launch issue of *Practical Wireless*, which appeared in Spetember 1932.

Looking Back 1920-1929
Snippets from the archives of hobby wireless magazines.

Practical Odds & Ends
Reprinted from *Amateur Wireless* July 1927.

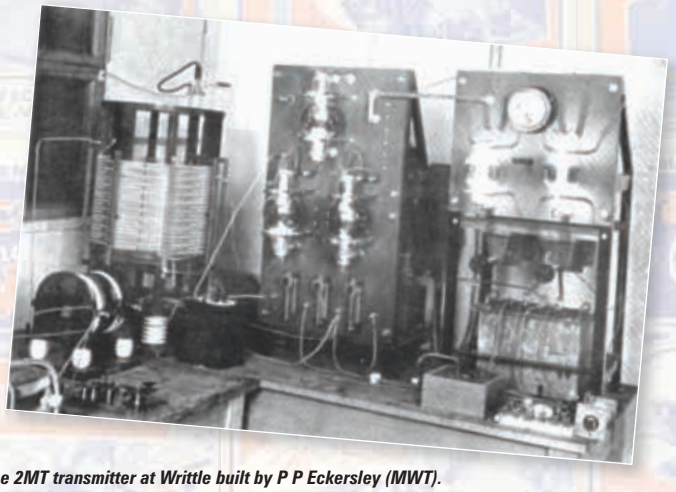
The Newest Freak Set
A Flower-vase Crystal Set project reprinted from *Amateur Wireless* June 1924.

Every month during this eventful year we take a look back at a decade of radio reading in this special 16-page supplement

Coming up this month

Hobby Wireless Publishing Before 1932

Part 1



The 2MT transmitter at Writtle built by P P Eckersley (MWT).

Introduction: In the autumn of 2006, during the planning stages for the 2007 75th anniversary year, I quickly came to the conclusion that the three special articles covering the radio hobby publishing before *PW's* first appearance in 1932, could only be done by one person – **Charles Miller**, the Editor of *The Radiophile* magazine. In the first of his series, Charles provides a compact history of wireless hobby publishing from his unique perspective as a specialist Editor – specifically for our readers and I'm indebted to him for his magnificent efforts. Charles has provided material from many sources and much of it has never been presented in one single, easily accessible article before. Readers interested in obtaining copies of *The Radiophile* (subscription only) magazine will find details in the special advert in this issue on page 40. **Rob Mannion G3XFD**

Part 1 – Radio Hobby Magazines from 1920

A history of popular – with a small 'p' – radio magazines from 1920 was my remit from the *PW* Editor and it has proved to be a most interesting and absorbing task! There appears nowadays to be an unfortunate assumption by some people that all that's required to produce an article on anything under the sun is to tap a few letters into a computer and to download the results, ready made, into your printer and Bob's your uncle!

Well, you might indeed get something about radio magazines but it would be so-called 'received knowledge', i.e., reports on the subject that have been doing the rounds for years and (often without any justification) being accepted as gospel truth. So, as an old-time investigative journalist I approached the job in the old-fashioned way, which was to seek out my own research material. I decided to trust nothing until it had been cross checked at least once, maybe twice or more, with the only really reliable sources of titles, editors, ownership, publication dates and various other matters, which were the actual magazines involved. In this respect even memoirs written by some of the people personally involved have proved to be suspect!

The *Radiophile* Archives

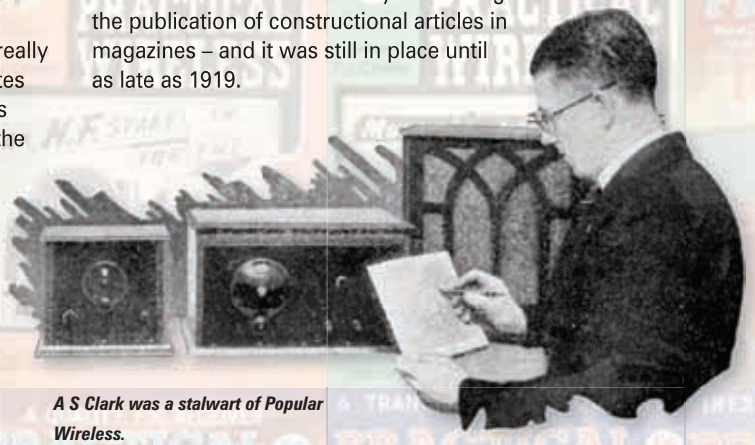
We have a large archive of old literature here at The *Radiophile* but I needed even more information than this could provide, so I went on the trail to find more. My search took me to bookshops as far apart as Shropshire and Norfolk, to dimly lit cellars and to dusty attics and even by great serendipity to charity jumble sales!

It also took me to my good friend **Philip Davies'** meticulously kept archive, to which he not only allowed me unlimited access but also provided food and drink while I took numerous notes and photographs. In all, I read scores of old books and magazines. The result of this toil you'll find here and if it provides some surprises you may be sure that it has done for me, too!

Before we start, though, let me make it clear that this series of articles is not going to be an exhaustive list of every magazine ever published that contained something in passing about radio, or those highly technical publications that were intended to be read by the higher echelons of the commercial radio world. If this were attempted it would take about three full issues of *Practical Wireless* to detail them all!

Broadcasting & The Radio Hobby

Broadcasting in Britain and popular radio magazines grew up together, so to deal with the one we have also to deal with the other. Something that has to be remembered is that at the start of the First World War an absolute ban was imposed on any form of Amateur Radio activity – including the publication of constructional articles in magazines – and it was still in place until as late as 1919.



A S Clark was a stalwart of Popular Wireless.

Charles Miller – Editor of the specialist magazine *The Radiophile* – provides a fascinating insight to the world of hobby wireless magazines before the launch issue of *Practical Wireless*, which appeared in September 1932.


WHAT TO SEE AT THE EXHIBITION

Amateur Wireless And Electrics

CONTENTS

CONTENTS

Let Us Help YOU in Your Wireless Troubles. Tell Us of Your Difficulties. We Can Solve Them. (See page 260)

Amateur Wireless, *also at the time of the 1922 Wireless Exhibition. Poor quality paper and no bylines but better things were to come...*

It was not even legally possible to purchase valves, which inspired an enterprising 24-year old called **F J Camm** to describe (in a magazine for amateur mechanics) a method of making a rudimentary external-anode diode by wrapping silver paper around the envelope of a car headlamp bulb. It was officially forbidden, however, for anyone to make a wireless receiver (although this nonsense must have been pretty freely ignored and eventually was abandoned in November of that year).

Thus, with little incentive for anyone to produce specialised publications for wireless enthusiasts, there was in 1920 a distinct lack of reading for them, apart from two magazines published by Wireless Press, a subsidiary of Marconi's Wireless Telegraph Company (MWT) One of them was *Radio Review*, which commenced publication in October, 1919, the other the longer established *Wireless World*.

Wireless World was a direct descendant of *The Marconigraph*, a monthly periodical started in 1911 as more or less a house magazine for MWT. Two years later, the proprietors decided to widen its scope and to sell it on bookstalls, changing the name to

H J Barton Chappel.

Wireless World (WW) to dispel any impression that it might be just an advertising publication for MWT.

Links were established with the **Wireless Society of London** (WSL) – later to become the **Radio Society of Great Britain** (the change was first mooted at the ordinary general meeting September 27th, 1992 and instituted shortly afterwards) and *WW* became the Society's official organ. *Radio Review* was merged with *Wireless World* in March, 1922 under the (hardly surprising) name of *Wireless World and Radio Review*. It carried lengthy reports of the WSL and other radio organisations' proceedings, pages of replies to correspondents and a high proportion of advertising material but was short on useful technical articles and frankly was rather dull.

Speech & Music

The first speech and music broadcasts to be made in Britain are generally accepted to be those made by MW from Chelmsford in January 1920 but all too often the details of the transmitter used are incorrect. Using callsign MZX, the station was built by **Captain Round** assisted by a **Mr Ditcham** and a **Mr Mogridge** putting out 6kW on a wavelength of 2,750 metres into a T aerial suspended from twin 450 foot towers.

The transmitter was operative from November 1919, with the first speech and music being sent out on January 15th, 1920. Successful reception was reported by 214 listeners in the UK and the broadcast was also heard in Norway and Portugal. A month later, the power of the transmitter was raised to 15kW.

The best-known of the MZX transmitter's broadcasts was that commissioned by the *Daily Mail*, Dame Nellie Melba's half-hour concert on June 15th, 1920. Far from encouraging this public-spirited venture, on November 23rd that year the Post Master General announced in the House of Commons that MZX was to be closed down on the grounds that it was "interfering with legitimate services". In the words of one historian of broadcasting, "silence fell upon the airwaves of Britain for the next eighteen months." In fact, it seems that this was far from being the case.

Amateur Reception Licences

The Post Office had resumed the issuing of licences for amateur reception at the end of 1919 but, officially at least, not for transmission. And yet, we come up against the inconsistency of **2AZ William le Queux**, a then well-known writer of 'thrillers' and keen wireless experimenter since 1909 (more of him in another article) has written a description of how he set up a broadcasting station at the end of 1919.

Apart from le Queux's fame as a writer he had connections with the Admiralty and this must have helped him to get strings pulled. In his own words, "everyone was exceedingly kind to me, even the authorities who rule the ether". At his house on the Hog's Back in Surrey he built a transmitter, which operated on "about 1,000 metres." Evidently strict control of frequency was not insisted upon in those days!

It took some time to get the transmitter working effectively but eventually, with the active help of MW, he was able to broadcast both speech and music via gramophone records so successfully, that he received reports from as far north as Aberdeen, 550 miles distant, and also from Belgium. Was there one law for 2AZ and a different one for others? Be that as it may, once he had got the transmitter working reliably he broadcasted (as they said in those days) almost every evening, plus some daytime working, for seven months during 1921.

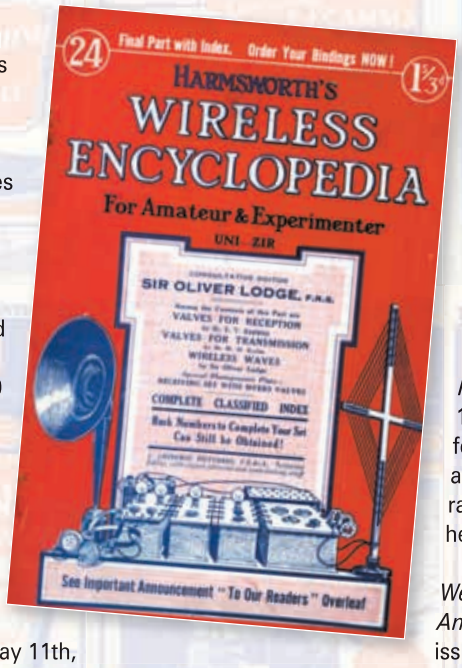
If all this is correct (and from the list he gives of distinguished Amateurs and professionals alike who sent him QSL reports there seems to be no reason to doubt it) his transmissions took place

F J Camm at his desk.

immediately after MWT's broadcasts from Chelmsford had been closed down and kept the interest in wireless growing, thanks to public demonstrations of reception carried out by a **Mr T Finucane** under the auspices of MWT.

After much pressure from the WSL and other bodies the Postmaster General (PMG) relented and permitted a whole half hour (!) of broadcasting per week from 2MT, a 250W transmitter built by P P Eckersley for a subsidiary of MWT's called the Marconi Wireless & Scientific Instrument Company (MW&SIC). It employed a 4-wire inverted L-type aerial supported by two 110 foot masts and initially worked on a wavelength of 700 metres, later changed to 400 metres.

The 2MT broadcasts commenced on February 14th, 1922 and MW itself built another transmitter at its headquarters, Marconi House in London. Using the soon-to-be-famous callsign of 2LO it was rated at 100W and worked on 369 metres with a twin-cage aerial suspended from two 50-foot masts on the roof of the building. It was permitted to broadcast for one hour per day, the first transmissions being made on May 11th, 1922. It continued to operate for six months until November 15th of that year.



Harmsworth Press, famed for its part-works, started to issue its Wireless Encyclopedia by weekly instalments.

Interest Aroused

Despite the pioneer broadcasts being so limited in time and content, the interest they aroused made it inevitable that before long a proper broadcasting service should be established in this country. It was at this time that magazines for wireless enthusiasts began to proliferate.

The accolade for being the first magazine off the mark appears to go to *Popular Wireless Weekly*, which first appeared on June 3rd, 1922. It was published by the Amalgamated Press, a well established concern noted for its output of comics and other fiction aimed at the youth of Britain, particular favourites being those magazines which featured Billy Bunter and other pupils at *Greyfriars* school (it's ironic that author Frank Richards' heroes of the stories such as Harry Wharton and Bob Cherry are practically forgotten, while Bunter, the ever-scrounging "fat owl" should live on).

Amalgamated Press also produced many annuals for youngsters including the *Boys' Hobby Annual*, not to be confused with *Hobbies Annual* – of that more later. The firm had the resources to employ top people at *Popular Wireless Weekly*, its Editor being **Norman Edwards**, Technical Editor **G V Dowding**, assisted by **K D Rogers** and **P R Bird** while for Scientific Adviser it had **Sir Oliver Lodge**, no less.

Frank Preston.

The magazine was a bright and breezy publication that deserved better paper than the pretty poor stuff on which it was printed. *Popular Wireless Weekly* changed its name to *Popular Wireless & Wireless Review* on February 2nd, 1924 and to simply *Popular Wireless* on October 23rd, 1926. In its issue for July 22nd, 1922 it featured articles by William le Queux and one **John Scott-Taggart**, of whom radio enthusiasts would shortly be hearing a great deal more!

One week after *Popular Wireless Weekly* hit the new stands, came *Amateur Wireless and Electrics*, the first issue being dated June 10th, 1922. It was published by another old-established firm, Cassells Ltd. which had produced many excellent works on such popular scientific subjects as electrical engineering and automobile engineering.

Cassells also published a long-running upmarket magazine for boys called *Chums*, which in the 1920s included regular wireless articles. The firm was fortunate in having a first-class Technical Editor in **Bernard W. Jones**, but strangely enough he was accorded only a tiny mention towards the back of the magazine for being in charge of *Amateur Wireless and Electrics* (*AW&E*). In fact, for a long time there were very rarely proper bylines anywhere in this magazine, which although cheaply produced on poor quality paper had some good features and was well worth the three pence (3d) a week it cost.

Perhaps Messrs. Cassells were only testing the market with *AW&E* in case broadcasting did not prove to be a success? But when its future seemed assured the firm brought out – in February 1925 – what was indisputably the best-produced of all early radio publications, *Wireless Magazine* (*WM*). Under the guidance of Bernard Jones, it covered a broad range of radio interests with articles on constructional projects, recent technical developments, programme reviews, the latest gramophone records and even a feature for ladies entitled *Wireless Feminities*.

The *WM* was printed on such good quality

Hobbies Annual for 1933. The lad on the cover must have been a mechanical genuis!

paper that 85-year old issues can today look as fresh as the day they left the presses. Its price was one shilling (1s). monthly, a not inconsiderable sum – but it provided excellent value for money.

Keith D Rodgers was another stalwart of **Popular Wireless.**

John Scott-Taggart

So, now we come to the extraordinary John Scott-Taggart (JS-T) who – according to his *Who's Who* entry – was some sort of wunderkind*. He was born in 1897 and served in First World War during which, he was mentioned in despatches and received the Military Cross and at some time was in charge of the manufacture of valves for the British Government.

In 1920, at the tender age of 23, JS-T was head of the Patents Department of the Radio Communication Company and between all this activity he had found time to write various books on radio valves and circuits and to be an active member of the WSL. In 1922 he founded and later became sole proprietor of the Radio Press (not to be confused with the Wireless Press), which published several magazines, the titles of which were apt to spring up, to change, to merge, to de-merge, to merge again and to disappear with bewildering rapidity!

The list produced by JS-T included at various times *Modern Wireless*, *Wireless Weekly*, *Wireless Constructor*, *The RadioGram & Wireless Answers*, *Wireless Review & Science Weekly*. The mind boggles at the enormous work involved in producing three weekly magazines and two other monthly publications – and if that wasn't enough many issues contained pieces by one John Underdown who appears to have been an alter ego of J.S-T.

A rare photography of Hugh Pocock C1923.

It certainly wouldn't be the first or the last time that an editor wore two or more hats, as any journalist who might read this could confirm! Fortunately, JS-T had secured the services of a truly gifted radio journalist called **Percy W Harris**, who later would become a noted editor in his own right and who appears to have been a genuine workaholic before the term was invented.

Although the paper on which the Radio Press magazines were printed was of poor quality, they were all quite well-produced with some distinguished contributors including Captain P P Eckersley, Chief Engineer to the BBC, Captain H J Round, Chief of Research for MWT and inventor of notable valves and microphones, **Captain West** of the BBC Research Department, **Captain L F Plugge** – later to be the owner of *Radio Normandie* (it broadcast sponsored programmes to Britain from Fécamp in France) and **Major James Robinson**, Director of Research and Chief Engineer to Radio Press. Note how the styles of all these gentlemen revealed their military background although JS-T himself refrained from using his service rank. Other writers soon to make names for themselves were **H Barton Chappell**, **R W Hallows**, **W James**, **G P Kendall** and **J H Reyner**.

Harmsworth Press, famed for its part-works, started to issue its *Wireless Encyclopaedia* by weekly instalments. It was extremely worthily produced with a stellar list of contributors and when completed it would make up a three volume (binding available at small extra cost) definitive work on the subject. Sad to say though, such was the rate of progress during its 18 month's gestation period that it was obsolescent by the time it had been collected and bound.

*Wonder child, a very special person! **Editor**.

Newnes & Radio Times

George Newnes Ltd. brought out a few informal text books on wireless but avoided specialised magazines on the subject because it was doing 'very nicely, thank you very much', out of its deal with the BBC to produce *Radio Times* (*RT*). Right from the start, on September 28th, 1923, *RT* sold 285,000 copies per week and must have been the nearest thing to a 'licence to print money' that had ever come the way of Newnes!

In April 1924, **John Reith*** was recording (rather grumpily) in his diary the fact that in the last six months that Newnes had made £5,500 profit on Radio Times, an enormous sum for the period. However, that didn't deter him from commissioning Newnes to produce a new BBC publication called World Radio, later subtitled The Technical Journal of the BBC, which brings us neatly back to the continuing saga of Wireless World.

*John Reith, (later becoming Sir John) was first General Manager of the British Broadcasting Company, Managing Director in 1923 and on the formation of the British Broadcasting Corporation, its first Director General and eventually received the title Lord Reith.

Pressure On Post Office

The story, as related in 1971 by **Hugh Pocock** (Editor of *Wireless World* from 1920 – 1941), is that in 1921 whilst the WSL was engaged in putting pressure on the Post Office (PO) to call off the ban on broadcasting, "a rival radio publisher" (but who?) offered £500 towards the Society's legal expenses.

Telephoning the manager of Wireless Press, Hugh Pocock then asked permission to match the offer in the interests of *Wireless World*. Permission was granted but when this was reported in the Press, all hell was let loose! At that time MWT was negotiating with the Post Office over contracts for wireless stations and the PO refused to continue while an MWT owned publication supported an attack on its monopoly.

Hugh Pocock received a rocket and MWT decided to sell off *Wireless World* to another publisher. If so, it certainly wasn't a hasty sale because *Wireless World* continued to be the official organ of the RSGB until the end of

William William le Queux 2AZ.

March 1924 and to be published by Wireless Press until the end of September that year, when it passed into the hands of Iliffe & Sons.

We only have to read the 1924 *WW* issues to see that it benefited enormously by severing the connection with the RSGB. Reports from wireless societies were gradually played down and the space saved used for constructional, technical and general radio interest articles, so that within a few months the new improved *Wireless World and Radio Review* was vastly different from the old. It was printed on good paper and carried sharply defined illustrations made from what must have been expensive blocks.

Despite what Hugh Pocock says, it seems more likely that the real reason for the magazine being transferred to Iliffe & Sons, was that it could not attract sufficient readers to sustain its production costs. Furthermore, his claim that the change of ownership led to improvements in the magazine is plainly nonsense. But then he was writing 60 years after the events and can be forgiven for lapses of memory.

The texture of the paper was reduced to that of ordinary newsprint and the picture quality became inferior, as a glance at magazines from 1924 and 1925 will reveal. Otherwise, the 'and Radio Review' part of title was relegated to smaller type and a new banner proclaimed it to be The Paper for Every Wireless Amateur.

By 1924, Radio Press was outgrowing its strength and feeling the pinch, if not actually yet on the skids. *Wireless Weekly* was incorporated into a new short-lived publication simply entitled *Wireless*, printed on extremely bad paper.

In November 1926, JS-T disposed of his interests in the firm and set himself up as a purveyor of high-class valves, each one sold to be individually tested by him and carrying his seal of approval. The project didn't last and Radio Press did not survive long after his departure.

Percy Harris, workaholic.

Wireless Review & Science Survey quietly faded away and *Wireless Constructor* was acquired by Amalgamated Press where, under the indefatigable Percy Harris it continued until well into the 1930s. Amalgamated also took over *Wireless* and incorporated it into *Popular Wireless*.

Ironically, after his doomed attempt at selling valves had collapsed JS-T returned to the Amalgamated fold and *Wireless Constructor* seemed to become his personal fan magazine. When it ceased publication in 1934 he transferred his unique mixture of technical expertise and ballyhoo to the surviving *Popular Wireless*.

New Publisher

While Messrs. Iliffe and Amalgamated Press were acquiring titles, Cassell & Co. decided to sell off *Amateur Wireless* (*AW*) and

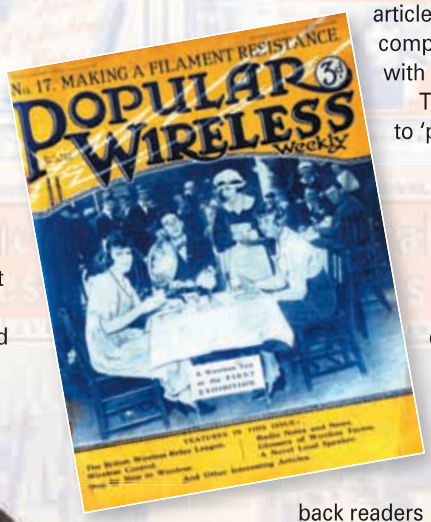
***P P Eckersley is not looking particularly happy to be appearing on the cover of* Popular Wireless!**

Wireless Magazine (*WM*) to a new publishing house set up by Bernard E Jones. The *WM* remained a quality publication and *AW* was vastly improved with more pages, more illustrations and better paper.

Bernard Jones well appreciated the pulling power of familiar names amongst radio enthusiasts and introduced by-lines for the staff writers and contributors. Both magazines would remain popular well into the 1930s.

Although the folding of Radio Press gave a major boost to the fortunes of *Wireless World* there was still a major hurdle to be overcome before it was to be truly in the black. The BBC's *World Radio*, mentioned earlier, initially confined itself to printing advance details of radio programmes to be broadcast from stations all around the world. However, it soon extended its activities to publishing technical and constructional articles, which brought it effectively into direct competition with *WW*.

The competition, combined with the BBC's ability to 'plug' its new venture over the air caused grave



Popular Wireless Weekly. *Bright Young Things sampling early broadcasts from 2LO at the Wireless Exhibition in October 1922.*

concern to Hugh Pocock who could see his readership being eroded. Protests to the BBC had little or no effect so, *Wireless World* began a ruinous war of attrition with *World Radio*. It too began to print exhaustive lists of foreign radio programmes, in the process winning back readers but losing money.

In fact, it didn't do *World Radio* any good either, until the inevitable compromise was reached with the BBC agreeing not to cover technical matters if the *Wireless World* dropped the programme schedules. From then *WW* flourished under Hugh Pocock but it must be said that although the publication later grew in size, the paper it was printed on did not improve. And the illustrations never regained the quality they had possessed during the Wireless Press days.

Modern Wireless and *Wireless Constructor* continued under their new owner, Amalgamated Press, which also published *Popular Wireless*. Under the surface, however, all could not have been well at Amalgamated.

By 1931 Percy Harris, who had served Wireless Constructor so well since its inception, had ceased to be named as its Editor and no one was credited as his successor, despite the fact that the magazine continued to publish a feature entitled The Editor's Chat. In place of his byline on the cover, was that of P P Eckersley as Technical Consultant, although G V Dowding was the official Technical Editor of all three of Amalgamated's magazines.

R W Hallows.

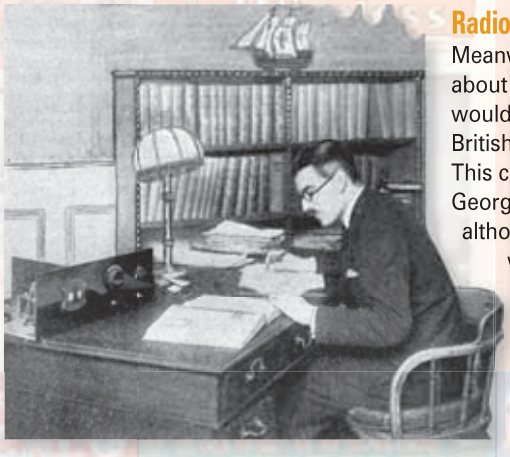
Crowd Puller Eckersley

Eckersley, or 'PPE' as he was popularly known was, of course, a crowd-puller because of his fame as builder of the fondly-remembered transmitter 2MT at Writtle and as Chief Engineer of the BBC, during which time he devised the Regional Transmitter scheme. His unfortunate involvement in a divorce action put him on a collision course with the puritan John Reith and he was more or less forced to resign his position.

W. Richardson.

After leaving the BBC, Eckersley divided his time between trying to arouse interest in a doomed project called "wired wireless" (i.e. sending radio signals down the electrical cables of the National Grid) and freelance journalism. Maybe Amalgamated envisaged him as another John Scott-Taggart because he was certainly given the full treatment for his National Three of 1934. It was featured complete with direct into the camera photographs of what they described as "Britain's greatest wireless technician" (one wonders what John Scott-Taggart had to say about that!).

Actually, although the set was only a three-valved tuned radio frequency (t.r.f.) circuit, it was far and away more advanced than anything JS-T had designed or would do in that line and featured three tuned circuits and a triple-gang condenser. Had things continued in that manner *Popular Wireless* might have lasted longer than it did but it soon reverted to being JS-T's fan magazine.



Victor King – noted set designer.

Radio Journalism Changes

Meanwhile, something was about to happen that would change the face of British radio journalism. This came about because George Newnes Ltd, although it had entered the wireless magazine field ten years later than the other publishers we've looked at, the firm had benefitted by having seen and learned by both the successes and errors of its competitors. George Newnes also had the enormous advantage of what was virtually a secret weapon – F J (Fred) Camm, the same talented young man whom we met earlier as a designer of a rudimentary home-made diode. Camm was a near contemporary of John Scott-Taggart, having been born two years earlier on October 6th, 1895, despite this similarity, their education and early careers differed considerably.

Fred Camm (FJC) learned to use his hands at school, not only at draughtsmanship but also at practical mechanics. So when he left school in 1910 he was well fitted to take up the early 20th Century challenges of automobiles, aviation, electricity and wireless telegraphy. Unfortunately little or no record* remain of his activities in these fields.

About 20 years ago, I was approached by Fred's nephew, **George Camm**, who not only had memories of the man (FJC) but also possessed the original plans of some of his constructional projects such as a miniature motorcar. We started to exchange letters but after my last one to him I received a reply from a solicitor telling me that he had passed away. So, that much that I would have wished to hear about his uncle was lost forever. RIP.

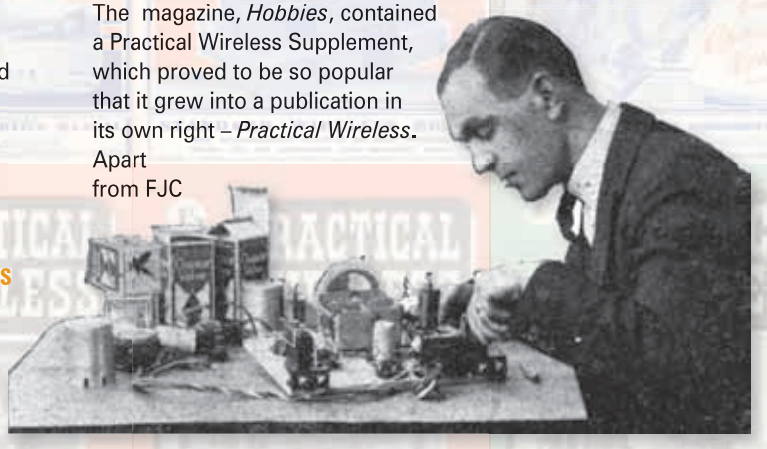
What we do know about FJC, is that in the late 1920s he was editing a Newnes publication called *Hobbies*, which catered for build-it-yourself enthusiasts in many fields. He also edited *Hobbies Annual*, a splendid yearly treat for amateur engineers of all ages but with particular appeal to youth.

As a schoolboy I built some of FJC's radio designs, from an ancient and dog-eared *Hobbies Annual* for 1929 scrounged from my father's bookshop! The design for a single-valve short wave receiver worked exceedingly well and provides many happy memories.

**By far the most comprehensive record of Fred Camm's life and work was published in* F J Camm The Practical Man*, by the late Gordon Cullingham. This useful, privately produced book has told me much about Camm's enignmatic character.* Editor.

Practical Wireless Magazine

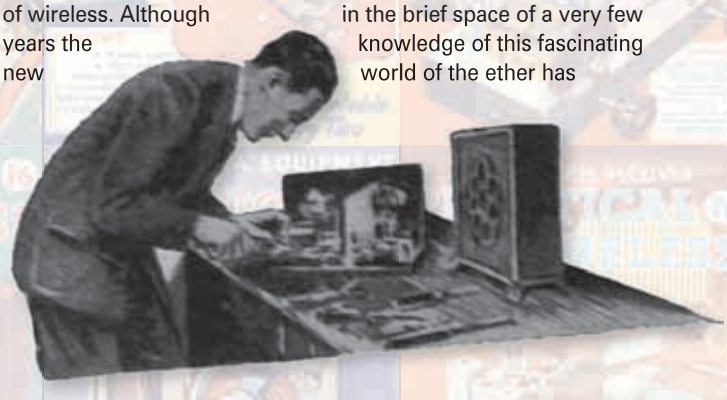
W Delaney.



The magazine, *Hobbies*, contained a Practical Wireless Supplement, which proved to be so popular that it grew into a publication in its own right – *Practical Wireless*. Apart from FJC himself as Editor, *PW* had a distinguished technical staff, consisting of the already mentioned H. J. Barton Chapple, Frank Preston, W J Delaney and a new name, **W B Richardson**.

The first issue of *PW* appeared on September 24th, 1932. I've read copies of it and of those for the following two months from the *Radiophile* archives and their quality shines through when I read them.

The difference between *Practical Wireless* and *Popular Wireless* that immediately springs to mind, is that the reader feels that they are being genuinely informed as a sensible person as opposed to being, in effect, kidded along by JS-T's hyperbole. In fact, FJC set out his aims for the new magazine in a typically forthright editorial: "Introducing Ourselves – *Practical Wireless* makes its début in the confident belief that it will receive a hearty welcome from the large and ever-growing circle of wireless enthusiasts, more particularly those interested in home construction and the experimental side of wireless. Although in the brief space of a very few years the knowledge of this fascinating new world of the ether has



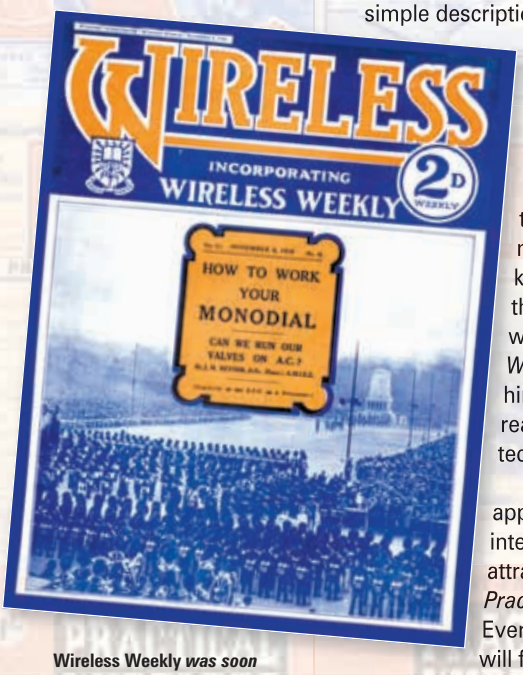
W James, another prolific designer.

Wireless Magazine – *the best-produced radio magazine of the 1920s. Printed on half-art paper. 80+ year-old issues appear as fresh as when they hit the news stands.*

grown to large proportions, we are still little more than on the threshold of the intriguing possibilities the future holds forth. Rapid as the advances have been, the near future will bring forth new discoveries, new ideas, and new techniques just as certain as day follows night, and every wireless enthusiast, if he is to derive full pleasure and interest from his hobby, will require as an absolute necessity that his knowledge be kept right up to date.

"**Keeping Up to Date**: It will be part of the policy of *Practical Wireless* to keep its readers abreast of everything new. Writers, acknowledged as authorities in various branches of wireless and in touch with every new development, will contribute on every subject that has a practical value to the reader. Skilled designers, with many successful sets standing to their credit, will exercise their ingenuity in the design of new sets combining for the constructor and experimenter the essentials of novelty with efficiency, bearing in mind also the important question of cost. Everything that is new, when tested and proved in its practical worth, will find its way into the pages of *Practical Wireless*.

"**Simplicity of Treatment**: Of great importance, particular care will be taken in presenting the contents in clear and simple language. Highly technical terms will be dispensed with wherever simple description can be employed, and diagrams will be prepared and explained so as to be readily understood. Thus the reader with a modest technical knowledge, or even the keen amateur, will find *Practical Wireless* appeals to him as well as to the reader with a sound technical knowledge.



Wireless Weekly *was soon assimilated into Wireless.*

"New sets appearing at frequent intervals will be an attractive feature of *Practical Wireless*. Every set described will first be thoroughly tested under varying and stringent conditions so that the reader may know that it will do all that is claimed for it. It is the intention also to cover every need of the home constructor in the sets featured. It will be explained how a set may be modified to suit particular conditions, how it may be adapted for use as a radio-gram or a short-wave receiver; how flat dwellers with restricted space can adapt a set to meet these conditions. *Practical Wireless* plans to deal a with each set adequately rather than to produce too many new designs, a policy which is apt to leave readers with difficulties to surmount after a set is made.

"**Our Laboratory**: A well equipped laboratory staffed by enthusiastic experts closely associated with the home constructor movement, will examine and test the latest components, the results of which will be reviewed in *Practical Wireless*. This feature will be of invaluable help to the home constructor in planning and making up sets. Every component used in *Practical Wireless* sets will pass our laboratory tests and our Advice Bureau will help readers with their difficulties and problems. Expert advice is available and readers are invited to use it freely. In view of the constant and marked progress that is being made in the design and construction of components, this service will be of the greatest value to those planning and making sets.

"**Readers' Ideas Invited**: New ideas from readers are invited. If you have a clever notion or an ingenious gadget you have discovered for yourself, it will be printed if approved and paid for at our usual rates. We shall also welcome suggestions and criticisms. They will assist us in carrying out our policy of fully satisfying the reader in the service we give him."

You can't say fairer than that can you? and the first issue of *Practical Wireless* had and still does have an instant appeal for readers!

Let's glance through the first issue together. On Page 6 we find photographs of a new design for a compact radiogram in which the record deck is concealed by being pushed into an upright position within the cabinet. This idea pre-dated (by 25 years) a radiogram produced by EMI in the 1950s. On Page 7 W J Delaney discusses methods of controlling volume in receivers, something that presented a puzzle to many constructors of the period. Then followed a design by W H Deller for a versatile multi-purpose baseboard which was a precursor of Veroboard, again available 25 years later.

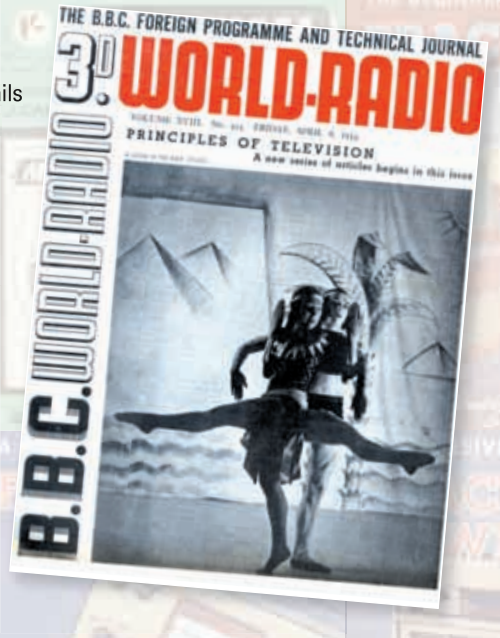
Then, FJC described his Dolphin Straight Three, a simple little t.r.f. for which no fancy results were claimed but which would be easy-to-build and would give an adequate performance for local-station listening. There's a favourable test report of the Lotus Bud AC mains receiver. Incidentally, this receiver's build quality may be judged by the fact that we have had a number of these sets – still in working order – pass through *Radiophile* auctions 70 and more years later.

Next in *PW*, W B C Richardson examined and exploded some common "Fads and Fallacies" and H J Barton Chapple discussed the problems of distortion in wireless receivers. There was also a feature on faults that might reduce the performance of radio sets and a short piece on how to use a pentode in the output stage.

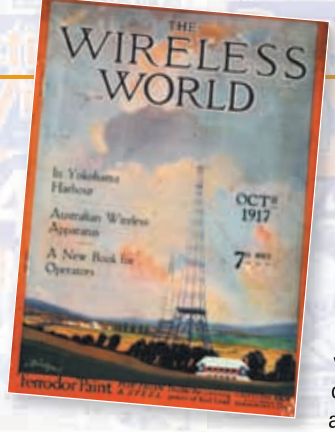
Much More!

There's much more in *PW* besides those featured mentioned! The leading feature was the design details for the *Long Range Express Three receiver*, for which a free blueprint was included in the magazine (we still have one in our archives at *Radiophile*).

Again, there was no high-powered hyperbole á la Scott-Taggart but instead there was measured, cogent descriptive prose for a rather nice little circuit for a 3-valved t.r.f., having in the radio frequency (r.f.) amplifier stage a variable-mu screen grid with its



World Radio *and* **Wireless World** *in the days when they were head-to-head. Hugh Pocock had reason to be worried about competition because the BBC publication was, in fact, very readable and informative, technically.*



Wireless World, *October 1917. Fine cover but low on content.*

gain controlled in a civilised manner by means of a potentiometer varying its grid bias. Note that this was miles ahead of even EMI's set, which as late as 1934 was using a rheostat to vary the filament voltage of the r.f. amplifier in its Long Range Three battery set (I seem to remember repairing one of those sets for *PW* a few years ago*).

The Long Range Express Three also featured a pentode output valve with tapped choke (autotransformer) coupling to the loudspeaker via a 2μF condenser so that its terminals were "dead" with respect to chassis.

**Yes, you did Charles, almost 15 years ago! It was bequeathed to Donna Vincent G7TZB (Production Editor), by her great aunt. The set is in working order still but requires new batteries!* Editor.

Wireless World & Review, *October 20th, 1922. Worthy but dull.*

Improving Results

Also in the first issue of *PW*, Frank Preston offered an article on how to improve results from your existing receiver. Meanwhile, another piece gave advice on how best to site components in a set to avoid instability.

There was much more as well in the 68-page début issue of *Practical Wireless* and I don't doubt that amongst the first eager buyers at the news stands were the editors of the rival publications. If they felt a frisson of anxiety when they read the magazine they were fully justified – because it obviously was streets ahead of what they were offering.

The new magazine could not have come at a worse time as far as they were concerned because the market for constructional magazines was already being eroded by the massive increase in manufactured radio sets of good quality and performance. They were housed in well-designed cabinets and could be bought on the never-never system (Hire Purchase), thus making self-build far less attractive.

The results of this and the arrival of *Practical Wireless* on the scene were soon to be demonstrated; *Modern Wireless* closed down in the December of 1933 with *Wireless Constructor* following 11 months later. *Amateur Wireless* merged with *Practical Wireless* in January, 1935 and Wireless Magazine closed about 18 months after. *Popular Wireless* itself (by then including the short-lived *Television Times*) ceased publication at the end of 1937. *Practical Wireless* never looked back.

Why The Success?

Why did the successful *Practical Wireless* sweep away the competition? To me, it's all too obvious when I compares issues of *PW* and other radio magazines during the 1930s when receiver technology was advancing by leaps and bounds.

Whereas *Popular Wireless* seemed to be mired in the 1920s with Scott-Taggart's idiosyncratic t.r.f. sets, FJC kept his promise to march with the times. Through the pages of *Practical Wireless* readers were introduced to automatic volume control (a.v.c.), delayed a.v.c. and delayed amplified a.v.c.; to automatic tuning and to automatic frequency control (a.f.c.); to high fidelity reproduction of both radio and records and to every other technical advance.

At a time when *Popular Wireless* was still plugging away with tuning arrangements that were ten years out of date, *Practical Wireless* was featuring a home-built set with push-button control. In fact, FJC's great strength was – although he never forgot the newcomers to radio and the magazine continued to print circuits for simple sets with which they could capture the thrill of self building – once they had gained confidence they were encouraged to move on to bigger and better things.

As a typical example of how the *PW* approach was achieved, in one issue (from 1937) a method of converting a t.r.f. receiver to a superhet was detailed. But just in case this might prove too exacting for less experienced readers, another article discussed the simpler expedient of adding a tuned h.f. amplifier.

Much More Credit

However, much more stands to the credit of FJC than merely winning readers from other publications. Because *Practical Wireless* was so usefully informative and because he also wrote many excellent technical books on radio, a very large number of young men were inspired to take up the subject, perhaps first as a hobby and then as a profession.

The existence of this knowledgeable and enthusiastic body must have been of immense assistance to the war effort in the years 1939 to 1945 and if FJC received no medals there are a lot of people who look back with gratitude for what he achieved. The present writer is one of them.

At the back of my desk, as I write this, are some of FJC's books treasured as reference material, such as his *Wireless Chokes, Coils and Transformers* (first published 1937, eighth edition 1949). It's an excellent little volume high on practical information and low on the sort of waffle, with which other writers of the period padded out their works. When I was in my early teens and building numerous experimental receivers FJC's *Wireless Encyclopaedia* was my Wireless Bible.

As a tribute to the receiver designs published in *Practical Wireless*, a few years ago I discovered in the Radiophile archives a hand-drawn circuit for a two-valve a.c./d.c. midget receiver with switch selection of two pre-set stations. There was no indication of where it had originated but it seemed so ingenious and worthwhile that we published this in *Radiophile* and invited readers to build receivers using it.

We were then staggered to receive a letter from a gentleman who not only revealed that the circuit must have been re-drawn from one published in *Practical Wireless* early in the Second World War for a utilitarian Home Service/Forces Programme receiver, but that he had actually built an example at the time. It was with great pleasure that we met this gentleman at one of our *Radiophile* events during which he demonstrated that the now (well over) 60-year old set was still in good working order!

Versatility & Energy

Fred Camm's versatility and energy – he also edited *Practical Mechanics*, *Practical Motorist*, *Practical Householder* and various other magazines – was legendary. He told people that he thrived on hard work but the opposite is all too evident when I compare pictures of him in his prime in the 1930s, slender and radiating incisive energy, with those taken in the 1950s (he died in 1959) when he had aged almost out of recognition.

Let's not dwell on the ageing process though, and remember FJC as he once was. To paraphrase the poem, "he burned his candle at both ends, and it certainly made a lovely light!"

News, Views and Memories from Pre-PW Days

Television April 1929

Secretaries Announcements

The Annual General Meeting of the Television Society marked the close of the first year of the Society's work and as all members present were congratulatory on the growth and conscious effort of the the whole of this well-timed organisation. The membership is close on 500 strong, the majority being Fellows having academic or other special qualifications and over 500 other indexed names have been regularly notified of the Society's meetings, as a result of application or requests.

Business for Sale

Wireless business, well established, exceedingly low rent and very good position . £500 including stock. Write 'D', Smith's Square, Bournemouth.

Amateur Wireless February 16th, 1924

Wireless in America

A report from America states that the principal companies of the Radio Corporation of America have been cited to answer within thirty days, a charge relating to unfair competition. It is alleged that certain companies pooled their respective patent rights. Rights to manufacture apparatus under these patents were then alloted only to members of the 'pool'. Apparently, this form of 'unfair competition' is against the laws of the United States.

The companies concerned include the General Electric Co., the American Telephone and Telegraph Co. and the Westinghouse Electric Manufacturing Co. As an instance of the enormous profits made by the Radio Corporation, it is reported that in 1922 over 6,000,000 valves were sold, at an average price of 20s. The only other company licensed to make these valves sold 94,100 during the same period.

A complaint is also made that the trans-oceanic wireless service is also controlled by the Radio Corporation, excepting only the Government stations. The complaint was lodged by the Federal Trade Commission.

The *Wireless World and Radio Review* April 27th, 1932

In 1932, *The Wireless World and Radio Review* was already celebrating its 21st Birthday!

Short wave aerials at Nauen, near Berlin are here seen from an unusual angle. The frames on the right and left contain the weights for adjusting the tension of the reflector wires.

The First British Broadcast?

When was telephony reception first available to amateurs in Great Britain? The celebration of The *Wireless World's* 21st Birthday has prompted a reader to record his first experience, in 1913, of listening to wireless telephony tests carried out at the Crystal Palace. He remembers hearing a gramophone record and also a reading from a newspaper by a man in the North Tower, the transmitting apparatus being installed at the Penge entrance.

Reports from readers who heard this or any previous telephony tests should make interesting reading.

Amateur Wireless June 14th, 1924

Derby-Day Traffic Control by Wireless

Two photographs showing the police vans equipped with wireless that worked in conjunction with a captive observation balloon to control the traffic at Epsom on Derby day.

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?

The *Wireless Constructor* May 1932

May 1932

A Useful Screwdriver

Most of us have at some time or other been faced with the task of inserting a screw in an inaccessible place. You all know the kind of thing – a spot where it is impossible to guide the screw with the fingers until it 'bites' sufficiently to hold itself in position unaided.

The Clarke's Gripscrew overcomes the difficulty. It is a slender screwdriver provided with a collar at the handle and two wedge-shaped blades. The screw slot is placed the centre of the blades and the collar is then pressed towards the blade ends of the screwdriver. That causes the blades to wedge into the screw-head slot and thus hold the screw firmly.

The screwdriver is available in sizes up to 1/4in and will be found very useful by the set constructor. The sample we tried functioned admirably with the small screws used in wireless work. The makers are The Rawplug Co., Ltd.

July 1924

Amateur Wireless **August 16th, 1924**

Novel Crystal Set

Aug 1924

Because of his jolly appearance, this old gentleman makes me feel that I want to listen-in every time I look at him — he so obviously enjoys wireless. With his whiskers making contact with his diamond (crystal) stud be looks business-like too.

The tuning coil is accommodated on the outside of the topper, all the wiring being internal. The old gentleman is made of Grafton china.

Tuning is carried out by a small slider at the back of the hat. Aerial, earth and phone terminals are provided at the base. These sets are marketed by the Mansard Studio, Palmerston Street, Durham.

Amateur Wireless **October 1st, 1927**

Some Unique Loudspeakers

Oct 1927

Amongst the many and varied designs of the loudspeakers on show at Olympia are those invented by the Marquise de Andia-Trarranzaval. An example of these exceptionally artistic loudspeakers is shown in here and it will be agreed that it represents a radical departure in loudspeaker appearance. Not only artistically are they of interest but also from a technical point of view they merit attention.

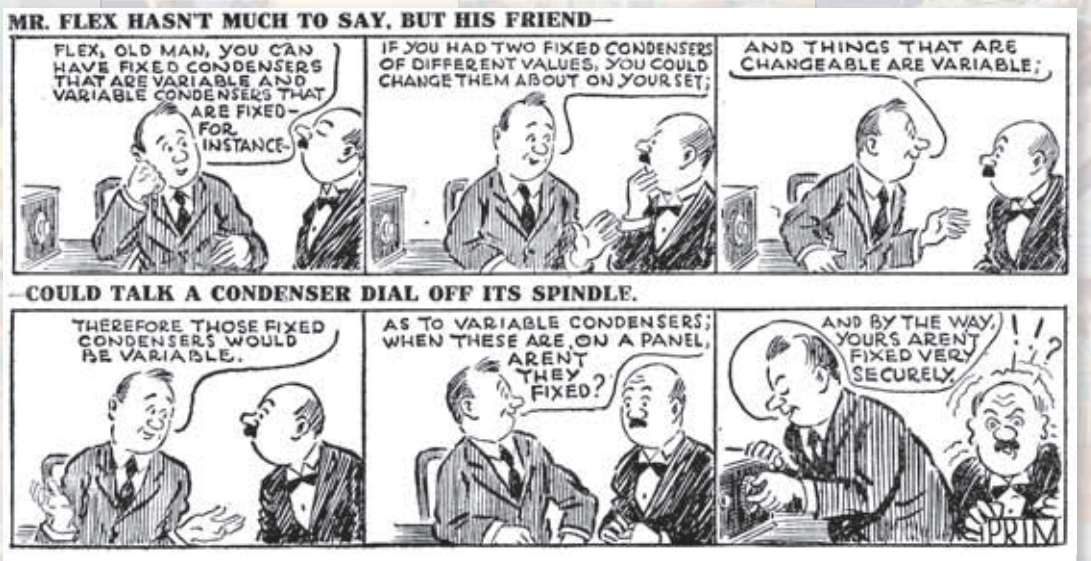
Amateur Wireless
July 19th, 1924

The Largest Frame Aerial

What is said to be the largest frame aerial in the county has been erected on the roof of the tower of the Bush Building Aldwych, W.C by the United Shipping Board. The frame is 8ft by 8ft and is wound with 48 turns of wire. The aerial was designed by Mr R H Redmond, the European supervisor of the United Shipping Board.

Dec 1929

Amateur Wireless
December 21st, 1929



Sept
1929


RADIO EXHIBITION
OLYMPIA
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SIEMENS
STAND Nos 69 & 71
MAIN HALL
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on the correct use of Radio Batteries by
Mr. Full O'Power
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PRICES
POPULAR TYPE
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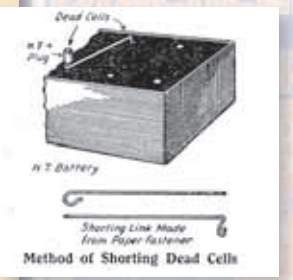
No. 1202 100 volts - - 13/-
POWER TYPE
No. 1204 "Power" 60 volts 13/6
No. 1206 "Power" 100 " 22/6
GRID BIAS
No. G.9. 9 volts - - - 1/6
SIEMENS BROTHERS & CO., LTD., WOOLWICH, S.E.18

PRACTICAL ODDS & ENDS

Shorting Dead Cells

Beginners may not be aware of the fact that the presence of dead cells in an HT battery gives rise to persistent whistling and other disturbing noises. If your set is troublesome in this way, test the HT battery either with a voltmeter or a flash lamp of suitable voltage, and if any dead cells are found, short them immediately.

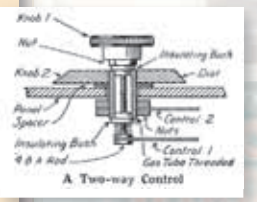


Method of Shorting Dead Cells

Shorting links can easily be made from a few paper fasteners, bent as shown. If they are made in this manner, the HT tappings may be inserted in the same socket as is already occupied by the link itself. AM

A Useful Two-way Control

It is often distinctly useful to have a control handy whereby two knobs actuated for independent purposes are mounted on one spindle, each being insulated from the other. A diagram is here given showing a simple method of construction. The drawing really explains itself, and it will be seen that the whole gadget is made up of odd or spare parts.



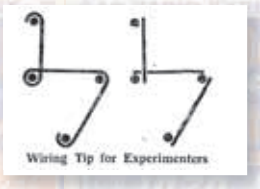
A Two-way Control

Knob 1 is bushed 4 BA. to receive the 4 BA spindle, which carries control 1, which may be for example, a sliding contact. Knob 2 is a small dial into which is forced a piece of standard gas tube, threaded with two nuts to suit. These nuts secure control 2, which may again be a further sliding contact.

It is essential to place the two insulating bushes, as shown (for which Clix socket bushes were used), if the two controls are to be insulated. The bushes will just fit with a little forcing into the gas tube. BH

A Wiring Tip

Receivers, which are to be experimented with before any final decision is arrived at can incorporate the following method of wiring. In many cases wiring is taken from point to point, including four or more points at one stretch with one piece of wire. This is often done where the wire is secured by terminals or solder.


Wiring Tip for Experimenters

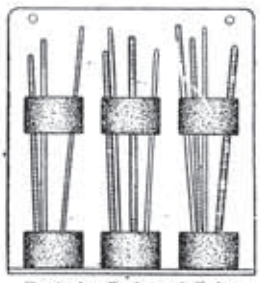
It is obviously an advantage to make separate connections to every particular two points for the reason that where any alteration is to be made, it is only necessary to extract one of the connections and replace it accordingly. The diagram given illustrates this point. HB

Rack for Rods and Tubes

If screwed brass rods are left lying about on the work-bench the threads are liable to become damaged by files, etc., and in order to avoid this it is well to provide a special rack for their exclusive accommodation.

The rack shown in the sketch will be found quite suitable. This is made from two pieces of board and six odd pieces of cylindrical cardboard coil formers, the latter being attached to the main board by means of small bolts.

The smaller board, which is equal in width to the diameter of the cardboard rings, is nailed to the lower edge of the main board to form a support for the lower ends of the rods.


Rack for Rods and Tubes

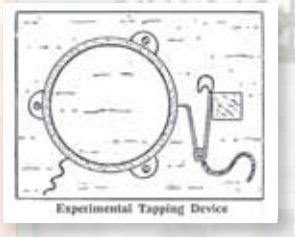
Screwed rods are usually purchased in 12in lengths; the distance between the two rows of rings on the rack kept specially for whole materials should therefore be about 8in and for shorter materials the top rings should, of course, be placed proportionately lower.

A good 'general purpose' rack might consist of six sections (twelve rings), the lower row staggered in step fashion in order to accommodate rods from about 3 to 12in or more in length. OJF

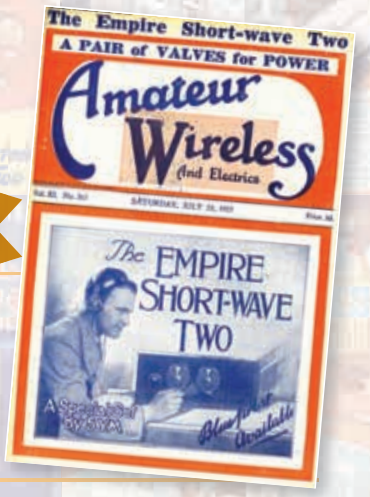
Experimental Tapping Device

The best tapping point for any coil can only be found by experiment, and the best method of procedure is to first wind a plain coil, find the best position for the tapping, and then solder on the permanent tapping lead.

The temporary tapping lead, which is flexible, is soldered to a medium size safety-pin, the point of which is bent out to a right angle so that when the pin is placed between the pillar and the coil, as shown, the point of the pin will force its way through the cotton covering on the wire, thus making the desired contact at any point. RS


Experimental Tapping Device

Let *Amateur Wireless* solve your Wireless problems



July 1927

A selection of what was happening during 1927 in the Amateur Radio hobby – how much do you remember?

Amateur Wireless June 7th, 1924

The Newest Freak Set

The Flower-vase Crystal Set

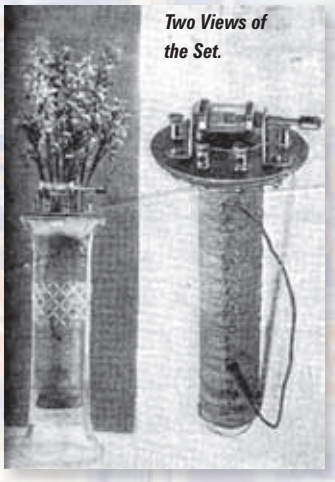
June 1924


THE NEWEST FREAK SET

PROGRESS AND INVENTION

Ornamental as well as useful, the novel receiving set shown by the photograph strikes a new note in broadcast receivers. It should appeal to those who dislike the appearance of the ordinary wood-cased instrument.

As will be seen from **Fig. 1**, a parallel-sided glass vase is used, which should preferably have a fairly large base. The tuning coil is wound on a glass chemical test-tube; this at the same time provides a receptacle for the water used for the preservation of the flowers placed in the vase. Contrary to what might be expected, the filling of the tube with water makes no


Two Views of the Set.

appreciable difference to the strength of signals received providing a fairly thick layer of insulating tape is wound over the test-tube before winding the inductance coil.

A small glass-enclosed crystal detector is attached to the tip panel, together with four small terminals for the aerial, earth and phone connections. The coil is kept in a vertical position by means of a disc of hard wood or ebonite placed over the lower end of the test-tube.

Tuning is carried out by means of a small window-ticket clip connected to a length of insulated flex; the clip is secured to the tapping loops made in the inductance winding, and once the correct tuning adjustment for the local broadcast station has been made it need not again be touched.

The positions of the parts on the top panel are shown in **Fig. 2**. It will be noticed that the test-tube is not in the centre of the vase but is offset slightly to allow room for the taps and tuning clip. **Fig. 3** shows the circuit.

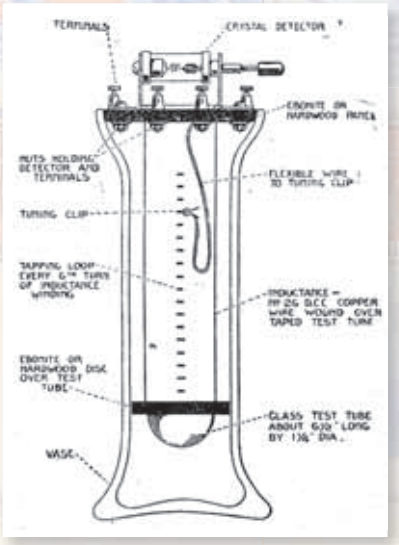


Fig. 1: Details of Receiver.

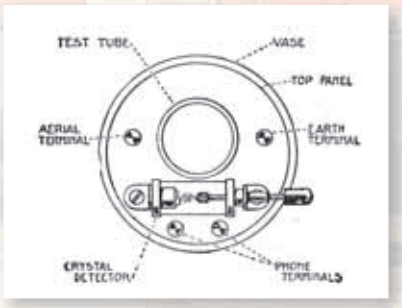


Fig. 2: Top of Panel.

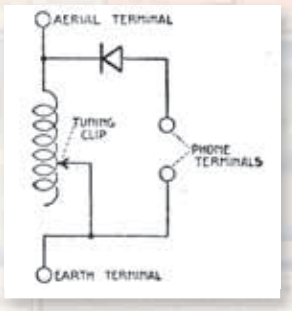


Fig. 3: Circuit Diagram.

Progress and Invention

Fitting Reaction

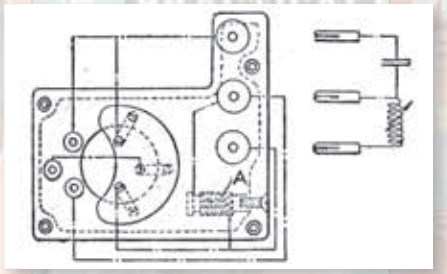
It is sometimes desirable to fit reaction to a receiver that ordinarily does not make use of it. This can be done, according to Patent No. 214,724/24 (R K Spencer, of Wallington, Surrey) by plugging a special fitting into the valve socket. The arrangement of this fitting is shown by the diagram. Three valve pins are provided to fit the valve socket, and the valve itself is fitted into sockets provided on the fitting.

Tuned-anode coils and condensers can be plugged in as shown on the right. The connections to the various sockets are shown. A condenser A is connected permanently in circuit. This fitting, of course, applies capacity reaction.

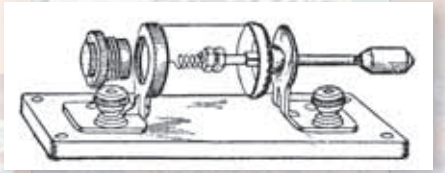
Crystal Detector

Most crystal detectors nowadays are fitted with detachable cups but should it be desired to change crystals in the ordinary glass-enclosed variety the detector more or less falls to pieces. In Patent No. 214,848/24 (Winfield Bros., Ltd., and C J C Winfield, both of Birmingham) is shown an improved form of glass-enclosed detector in which the cup can be removed without disturbing any other fittings. The way in which this detector is arranged is clear from the diagram. The fixing bracket does not obstruct the cup, which can be easily unscrewed.

A report from America states that transmission of photographs over landline telephone has been so successful that the system is practically ready for commercial use. It is also stated that plans are being made for the transmission of pictures to England during the winter.



Fitting Reaction (No. 214,724/24).



Crystal Detector (No. 214,848/24).

Dec 1927

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Practically Yours

75 years of Heritage & History

Join the *PW* team as we take a further look at hobby wireless before the birth of *Practical Wireless*

The Early Days of Hobby Wireless
Charles Miller - Editor of the specialist magazine *The Radiophile* – presents the second of three articles exploring the early days of hobby wireless. Following on from this issue, Charles will look further in depth at the early days and pre-broadcasting as we will travel back in time with him to the days before there were any specific hobby radio magazines.

Looking Back
More memories from years gone by – this month, we go back to the news, which featured in hobby wireless magazines pre-*PW*.

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Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

Aerials

GAREX ELECTRONICS VHF/UHF accessories and aerials, PMR equipment and spares. www.garex.co.uk Tel: 0771 4198 374 PO Box 52, Exeter EX4 5FD.

G2DYM/G4CFY AERIALS Custom made low noise, low TVI dipoles and trap dipoles. PVC covered stranded wire and 75 ohm feeder properly made-off. Epoxy potted traps. Centre piece and dog-bone insulators included. Spectrum Communications. Tel 01305 262 250. www.spectrumcomms.co.uk

SOTAbeams Lightweight 5-element 2m Yagi. Designed for portable use. Complete kit including mast, guying system and feeder. Only £78.45 including P&P.
Orders: SOTAbeams,
89 Victoria Road, Macclesfield SK10 3JA.
Lots more at www.sotabeams.co.uk

Repairs

REPAIRS TO ALL AMATEUR AND VINTAGE Rx/Tx Cost effective service. Phone or call in for details. Medway Aerials, Rear of 14 Luton Road, Chatham, Kent ME4 5AA.
Tel: 01634 845073.

For sale

Qtz x-tals 455kHz to 150MHz Std 10.106, 10.245, 10.7, 11.155MHz £1.00/unit. Callg 3.56, 7.030, 21.06, 28.06 £1.00/unit. 1.4MHz fltrs £14.00. 10.7MHz 10kHz fltrs £3.25 P&P £1.00 + VAT. IQ Electo 0208 391 0545. vincent@jakomin.fsnet.co.uk

REMEMBER THE PIRATE RADIO STATIONS? Caroline, London, City, Laser and RNI? Get a free pack of rare offshore radio stickers, postcards, photos when you subscribe for six months to *Radio Review*, the regular newsletter for the radio enthusiast. For a free sample issue and more information, send a medium size SAE to: Radio Review, Dept. PW, P.O. Box 46, Romford RM7 8AY.

KENWOOD TS-680S 150 Watt output. Opened up from 160mtrs to 6mtrs, plus AT-250 automatic ATU. All in working order, £495.00. Plus other equipment. Kenwood TH-702E, £150.00. Telephone 01978 821991 (Wrexham).

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FULL COLOUR QSL CARDS for all your QSL needs. Shirts and caps with callsigns and also ham cartoons by GW3COI. For free samples contact Chris M0DOL. E-mail: qslers@aol.com P.O. Box 184 Northampton NN3 9JH.

Valves

VALVES:- OVER 50000 STOCKED Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, (Jim Fish G4MH), 28 Banks Ave., Golcar, Huddersfield,
West Yorks HD7 4LZ.
Tel: 01484 654650/649380/650725.
Mobile:- 07733 283084.
E-mail: wilsonv@zoo.co.uk
Visa etc. Fast & personal service.

VALVES AND ALLIED COMPONENTS IN STOCK Ring for free list. Valves/ books/ magazines wanted. Geoff Davies (Radio). Tel: 01788 574774.

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Bargain Basement

SEND YOUR ADVERT TO:-
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Bargain Basement rules - £4 per advert

Please write your advert **clearly** in **BLOCK CAPITALS** up to a maximum of **30 words**, plus **12 words f**or your contact details on the form provided and send -it together with the dated corner flash and your **payment of £4 (subscribers** can place their advert **free of charge** as long as they provide their **subs number and corner flash),** cheques should be made payable to **PW Publishing Ltd.**, credit card payments also accepted.

Send your advert to **Bargain Basement, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** or E-mail your advert to **peter@pwpublishing.ltd.uk** (If you don't want to include your credit card details on your E-mail, just 'phone us on **0845 803 1979**.

Please help us to help you by preparing your advert carefully. Any advert which contains **??** marks indicates that the advertiseng dept. could not read/interpret the wording.

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You should state clearly in your advert whether equipment is professionally built, home-brewed or modified.

The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

FOR SALE

DIAMOND WIDEBAND discone antenna (stainless). Type D-130-N 25-1300MHz, £20. 37ft Clark mast, £85. Tel: 01228 577046 (Cumbria).

ELECTRONIC MORSE KEYER PIC programmed for 5-35w.p.m. for practice or transmit. With automatic switch-off. Easy build, detail provided, needing very few extra components, £10. E-mail: chick@chickene.freeserve.co.uk

HEATHKIT KEYER mains powered, dual paddle, £30. Junker key, excellent condition, £40. Bencher chrome single lever paddle, excellent condition, £50. All plus postage. Tel: Colin 01634 250427 (Medway).

KENWOOD (TRIO) TH-46E hand-held with dealer extended receive. Complete, boxed, £49.00 plus carriage. Tel: John G8BXO 01769 573382 (North Devon).

LINEAR AMP UK CHALLENGER 2 Capable of 1500 watts output from its single 3CX1500A7 ceramic triode with only around 65 watts of drive. One very careful owner from new. In immaculate condition and has seen very little use, sadly no box but full instruction manual supplied. This is a serious operator's piece of equipment built by arguably the best amplifier manufacturer in Europe, and it's all yours for £900. Buyer collects. Tel: Tim G4MFU 01905 420888. E-mail g4mfu@wraa.co.uk (Worcester).

MALDOL VK-5 ground plain antenna. 3.5/7/14/21/28MHz. Brand new, part assembled only. Garden too small, cost £220, accept £150. Post at cost or collect. Junction 1, M18. Tel: 01709 769845 (Rotherham, South Yorkshire).

MARCONI AM/FM signal generator. TF-995 A/1 1.5-220MHz with hand book, £40. Buyer collects. 26 assorted valves all unused including 6146 QQV06-40, 5B254M, ECF80, etc. £20. Tel: 01275 876155 (North Somerset).

RETIREMENT SHACK CLEARANCE Eddystone S640, S504; Yaesu FT-470, FRG7, FRG7700, FRV7700; Kenwood World Clock; Icom IC-R72; Lowe HF-250 & Keypad; FDK Multi 2700 needs Mic. Individual offers or for the lot. Tel: Derek 01376 327547. E-mail: peacheys@tiscali.co.uk (Essex)

SMALL LUCAS MOBILE TRANSCEIVER working on 10m FM. Amateur frequencies. 12V, 4 watts output. Ideal local contacts. Only £20 plus £5 postage. Tel: Alan 01284 827379 (Bury St. Edmunds).

STRUMECH VERSATOWER 40ft telescopic and tilting lattice mast complete with winches, ground post and rotator cage. increasing disability forces sale. Must ask buyer to arrange final dismantling and transport, £350. Tel: C M Smith G8KVU 02476 597411 (Coventry).

THREE VALVE TESTERS AVO Taylor. Tel: 0113 2403496 for further details (Leeds).

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YAESU FT-817 with charger and 12V supply, £240. Tel: Sam G3KVJ 0113 2675 618 (Leeds).

YAESU FT-840 with optional FM unit. Excellent working order, £250. Tel: John G4XYY 01937 844197 (Bramham,Nr Wetherby).

YAESU FRG-8800 internal FRV-8800, FRT-7700 and FRA-7700. All good working order and boxed. Operating instructions, Radio Amateur Callbook 2000, CD-ROM, *Ferrell's Confidential Frequency List*, 10th edition, RSGB Yearbook 1999, plus various aerial sundries, £200 o.n.o. Collect or carriage at cost. Tel: 01732 864920 (Edenbridge, Kent).

WANTED

CHEAP HF LINEAR for disabled ham. Can be very old but working. I am not bothered, cannot afford new but will pay carriage if not close. I hope someone can help, please. Tel: 0121 530 9994 or 07905 277 930 (Bilston, West Midlands).

GALVANISED HEAVY DUTY tripod to take 45mm mast for portable use. Tel: 01228 577046 (Cumbria).

LOWE HF-150 RECEIVER corrosion free, not Europa version and accessories. PS-150, SP-150 and AA-150. Lowe HF-235 receiver. Tel: Tony 01905 743605 (day) or 641759 (evening). Not after 21:00hrs, please (Worcester).

OLD HALF INCH FERRITE RODS must be half inch in diameter and be six inches long or more. Will pay very good money for the rods. Tel: Peter Tankard 0114 2316321 between 9am and 9pm (Sheffield).

TEN TEC Century 22. Tel: Dafydd 01766 512024 (daytime). (Gwynedd, N. Wales).

ZEUSS LID FASTENERS for Yaesu FT-221R. Tel: John G8BXO 01769 573382 (North Devon).

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bargain basement order form

Please insert this advertisement in the next available issue of *Practical Wireless*.

❑ **For Sale** ❑ **Wanted** ❑ **Exchange**

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Address .....

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Your advert, you decide! PLEASE - No FAXed Ads!

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B.B. Oct '07

TRADER'S TABLE

The equipment for sale on this page is secondhand or ex-demonstration

Disclaimer

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SHORTWAVE SHOP LTD

01202 490099

TRANCEIVERS

Icom IC736 HF/6 ..... £599
Icom IC706 MkII £599
Yaesu FT100D £499
Icom IC207 ..... £175
Alinco DX70H £425
Icom IC F22 x2 (PMR) £225
Navico AMR1000 145MHz £50
AKD 2001 ..... £60
Yaesu FT 920 ..... £599
Yaesu FT 747 ..... £275
Kenwood TR 851A 70cms £95

RECEIVERS

Bearcat 278 base £115
BPL Celeste World Space ..... £POA
Bearcat 278 base ex dem £139
AMI digi sat RX asr WS201 ..... £129
Sangean AT818 ..... £85
Hitachi World Space £55
Yaesu VR120d £115
Yaesu VR120 ..... £75
Yaesu FRG7700 + FRT7700 ..... £165
GRE PSR 225 ..... £249
JRC JST 135 ..... £425
JRC NFG 97 tuner £125
Radio Shack PRO28 ..... £55
Icom 8500 ..... £695
Icom R7000 ..... £345
Palstar R30 ..... £395
AOR EM8200 memory £35
Radio Shack PRO 63 ..... £75
Ten Tec RX350 & nbs p £495
Realistic DX395 ..... £125
Alinco DJX3 ..... £70

ACCESSORIES

Nissie base mic Yaesu/Kenwood £55
Icom SM6 base mic £49
Palstar AA30 active ant £45
Global AT200 ATU £49
Global AT1000 ATU £60
Kenwood fast charger BC15A(78) £40
Starmaster keyer £85
Tono MR1300E £60
Harrier CB £35
KPC-2 TNC £85
Paccomm Tiny-2 ..... £85
Harrier CB £35
Garmin GPS 48 ..... £POA
TNC 320 ..... £POA
MFJ 432 voice keyer £175
MFJ 1020C active ant £69
Kenwood MB11 mount ..... £POA
yaesu sp6 ..... £125
daiwa ps120m psu £35

For latest list please see www.shortwave.co.uk

NEVADA

023-9231 3090

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ALINCO DJC7 HANDY TRANSCEIVER £149
ALINCO DR135E Mk II MOBILE TRANS £129
ICOM 706MK IIG MOBILE WITH DSP £429
KENWOOD TS2000 w/MC60A/DSP/ATU £999
KENWOOD TS850S HF BASE TRANS £599
MMT 144/28 10W TRANSCEIVER £89
MFJ 9406 6M SSB TRANSCEIVER £139
PALSTAR KH6 6M H/H TRANSCEIVER £49
YAESU FT2800M 60W 2M MOBILE TX £115
YAESU FT736R 2/6/70CMS BASE TX £599
YAESU FT847GX HF/UHF/VHF RADIO £699

RECEIVERS

ETON E1 SHORTWAVE RECEIVER £299
GRUNDIG YB500 ALL MODE RECEIVER £89
ICOM PCR1000 COMPUTER RECEIVER £225
ICOM R8500 COMMUNICATIONS RX £799

HANDHELD SCANNERS

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BEARCAT 120XLT 100MEM AM/FM £79
BEARCAT 180XLT H/HELD SCANNER £109
BEARCAT 3300XLT 25-1300MHZ (GAPS) £159
BEARCAT UBC3000XLT AM/FM/WFM £110
ICOM R2 COMPACT AM/FM/WFM £89
BEARCAT 92XLT 200MEM AM/FM £70
BEARCAT 3500XLT WITH SOFTWARE £139
YUPITERU MVT7100 ALL MODE £149
YUPITERU MVT9000 MK II ALL MODE £215

BASE SCANNERS

BEARCAT 860XLT BASE SCANNING RX £99

CB RADIO

COMMTEL 40CH. BASE CB TRANSCVR £89
MIDLAND 98+ MOBILE CB TRANSCVR £69

ACCESSORIES

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COMMUNICATIONS HEADPHONE SET £15
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ICOM AT160 COAXIAL AUTO ATU £179
KENWOOD PS30M 20A POWER SUPPLY £110
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PAKRATT 232 DATA TERMINAL/LEADS £99
PALSTAR PS04 2-4A POWER SUPPLY £14
TIMEWAVE 59+ NOISE FILTER £159
TW232DX BASE MICROPHONE £25
VCI PM30 2KW POWER METER £59
YAESU MH35A2B SPEAKER MIC £19
ZETAGI HP700 METER £59
ZETAGI B300P LINEAR AMPLIFIER £89
ZETAGI V4 4 WAY ANT. SWITCH £8
ZETAGI M27 ANTENNA MATCHER £20

B-GRADE ITEMS

ALINCO DJX10 ALL MODE /H SCANNER £169
ALINCO DJ496 UHF HANDHELD TX £69
ALINCO DJX7 AM/FM/WFM H/H SCANNER £119
ANTENNA ROTATOR £34
BEARCAT 3500XLT CLOSE CALL SCANNER £129
BEARCAT 230XLT SCANNER £79
BEARCAT 72XLT CLOSE CALL SCANNER £69
BPL CELESTE WORLDSPACE/FM RADIO £29
ETON S350D AM/FM/SW RECEIVER RED £69
GENUS GEO DAB/ALARM RADIO £49
GOODMANS GPS280 DAB/CD STEREO £69
MAYCOM AR108 AIRBAND/MARINE H/H £54
NEVADA ND210E DAB RADIO £39
NEVADA SINFONIE DAB (BLACK) £49
NEVADA SINFONIE DAB (WHITE) £49
NEVADA SINFONIE DAB (BLUE) £49
PERSTEL DR301 DAB/FM SD SLOT £125
PERSTEL DR201 DAB/MP3 PERSONAL £39
PERSTEL DR101 PERSONAL DAB £49
PRESIDENT HARRY 80 CH CB RADIO £69
PURE TEMPUS 1XT DAB RADIO £49
PURE BUG TOO DAB/FM/SD CARD £89
ROBERTS RD12 DAB £85
YAESU VR120 AM/FM/WFM H/HELD £99
YUPITERU MVT3300 WIDEBAND SCANNER £99

Check our web site for latest items available.
E&OE. Prices quoted are in pounds sterling and exclude carriage

WATERS & STANTON

01702 206835

Alinco DJ-190T 2m FM H/held Transceiver + CTCSS £99
Kantronics KAM plus Multimode Dual Port Data Controller + Pactor £149
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Rob's chance to air his views!

Topical Talk

This month, the Editor's topical discussion mainly revolves around two letters published in Radio Waves. The first is from Ken Smith G3JIXC and the second, an anonymous letter, from a very concerned teacher who is an active Radio Amateur closely involved in Foundation Licence training.

Ken Smith G3JIX ('Jix' to his many friends) is an old friend of *PW* and a much valued personal friend. Ken has been very closely involved in the teaching and encouragement of young Radio Amateurs for many years. In fact, his training skills have been practised for so many years that I sometimes meet teachers who were originally taught by Ken and who are now professional teachers themselves. That surely must say something about the man?

In Ken's letter of support we've published (letters pages) he rightly draws attention to the need for special articles for the not-so-experienced to be published in *PW.* However, although both Ken and I are old enough to remember the regular publication of beginner's series (from the electron and Ohm's Law right up to simple transmitters) as a structured course – I think they've had their day in *PW*. Nowadays, for the intending Radio Amateur there are well structured courses for the Foundation and the Intermediate Licences already on stream, with courses for the Advanced Licence becoming available regularly.

I feel that the modern *PW* cannot provide a correctly structured course with the required syllabus as has appeared in the past, including the *Passport To Amateur Radio* series. Instead, I feel strongly that it's our job to compliment the work of the official courses by providing articles that can be enjoyed by our readers and 'teach' in a very informal, special way.

Bite Sized Chunks

By the very nature of a monthly magazine, we can only provide readable, 'bite sized chunks' of Editorial material for our readers. Most of our articles (especially the regulars) are only two pages, with the exception that comes with larger, rather special features. This is because *PW* is not a textbook – instead it's aimed at being an enjoyable read, indeed I aim to make our technical reading as enjoyable as possible. Because of this – particularly as most of our readers have busy working lives (seemingly busier if they're retired!) everything is aimed at giving a comfortable length article.

My own attention span is long enough to read a two page feature before I have to do something else and I think it's a good rule of thumb. Despite this, wherever necessary a major article (such as this month's feature on the early days of the radio hobby by **Charles Miller**) can be much longer. However, I'm sure most readers will understand why, as Editor, I work closely with my colleagues and authors to bring you the best articles in the most digestible form!

New Series

Our new series aimed at the not-so-experienced and anyone else who wants a technical question answered – is to be presented by **Colin Redwood G6MXL** from the January 2008 issue. Instead of the old structured teaching courses, Colin is preparing to operate the series by answering reader's questions in a straightforward way. So, if you have any doubts on tuning up your antenna for best results and minimum TVI/BCI and so on – write into Colin with your queries and he and the *PW* team will do their best to help.

Colin will eventually have his own *PW* E-mail address but for the time being please write or E-mail your questions to me (I'm sure we'll all learn something!). Colin, an extremely experienced Instructor at club level, will be delighted to hear from you.

Anonymous Teacher

The (disturbing in my opinion) letter from a very concerned, experienced teacher highlights what seems to be a major problem with our educational system. From my own observations, some of the school clubs I visit are well funded, have excellent premises, superb teachers and gifted students although some institutions don't have these luxuries, are state funded and also cater for students of all academic abilities.

In common with the anonymous teacher, I feel it's imperative that we encourage those who struggle with essential basic educational knowledge but who are keen to learn and enjoy our science. Once they've launched themselves, their enthusiasm for knowledge will grow as they progress through radio, they'll also be helped with their lives and careers – provided we play our part in helping them on their way.

Rob Mannion G3XFD/EI5IW

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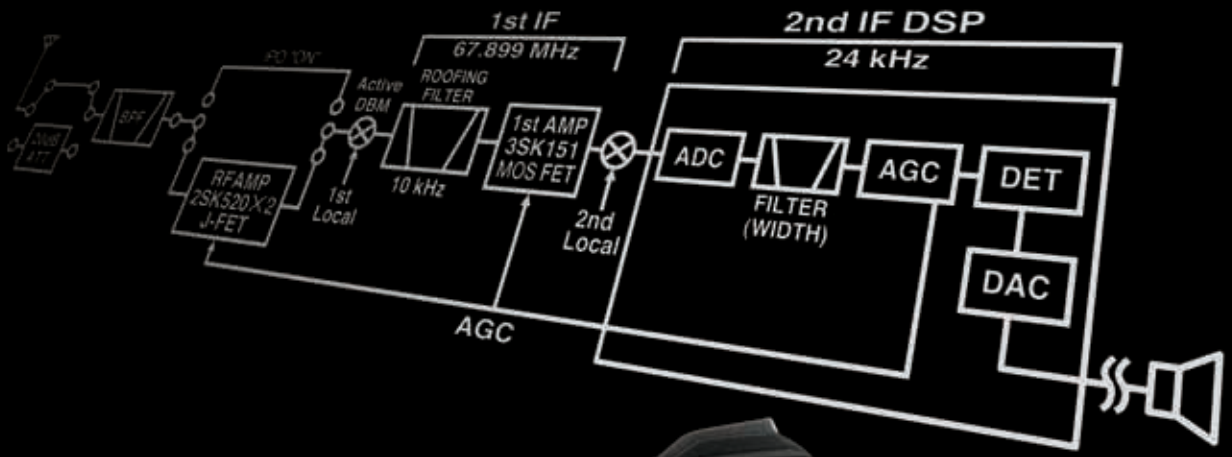

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