September 2007 | £3.35 ISSN 0141-0857

Practical WIRELESS

Now in its 75th year!

Britain's Best Selling Amateur Radio Magazine

A Practical Loop Antenna System

Build The Huff-Duff Seven

Happy 75th Birthday!

Celebrate PW's illustrious history in this milestone year as we look back to the very first issue, published in September 1932

Practically Yours

Highlights from Issue 1

WIN! A Yaesu FT-450 All-Mode Transceiver

75th Anniversary Commemorative CD

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RPF Comms TalkSafe

NEW

HANDS-FREE MOBILE USING BLUETOOTH

Talk safely on any mobile with both hands on the wheel.

This unit connects to your mobile transceiver and enables you to use a blue-tooth headset (not supplied) for transmitting and receiving. With the headset button acting as a latching PTT, you are free to operate your mobile transceiver with both hands on the wheel. Or a passenger can talk several metres away from the radio. Receiver audio can be fed to headset or left to rig speaker.

Order: TS-062-801 **£109.95 C**

Matching rig leads: Order: **TS-062-81* £9.95**

Radio Communications Equipment Guide 2007

368 Full colour pages, crammed full of the latest products, photos & technical spec. Carriage Discount Vouchers included.

JUST £2.95!
(+ £1.75 UK P&P)

Ham Radio Weather Stations

ULTIMETER Weather Instruments

NEW!

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 Multimeter-800 features • *Built-in pressure sensor • Electrical output alarm trigger voltage*

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

CREATE RC5-1

*Rotation Torque: 6kg/m *Brake Torque: 80kg/m *Max. vert load: 400kg *Max. horz load: 800kg *Mast size: 48-63mm *Weight: 5kg

£339.95 D

CREATE RC5-1

*Rotation Torque: 6kg/m *Brake Torque: 90kg/m *Max. vert load: 400kg *Max. horz load: 800kg *Mast size: 48-63mm *Weight: 5kg

£419.95 D

NEW

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

NEW - Performance Packed Radio

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

SSB CW AM FM from milliwatts to 100W. 105dB dynamic range at 2kHz! 33dB intercept point. Single Firewire cable to PC. No sound card needed. 24 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

£1442.55 ex VAT
£1695 inc VAT

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.

FT-2000

Buy Now Pay Later! 0% Interest!*

1.8-30MHz +6m 100W
£1945 D

FT-2000D 200W
£2399 D

FT-897D

Buy Now Pay Later! 0% Interest!*

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

£599 D

FT-857D

Buy Now Pay Later! 0% Interest!*

NEW LOW PRICE!

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

£499 D

FT-DX9000D

Buy Now Pay Later! 0% Interest!*

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**

KENWOOD TS-2000 Package Deal

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

All-Mode Multi-Bander

*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

NEW PRODUCTS - NEW PRODUCTS

KENWOOD TM-V71E

0% Interest!*

NEW

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

£269 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-817ND

Buy Now Pay Later! 0% Interest!*

YAESU

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

LOW PRICE!

£349 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=£8.95, D=£10 E=£12

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Online Catalogue
www.wsplc.com

UK's Lowest Prices

Zero Deposit
Zero Interest

Enquiries 01702 206835 / 204965

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

£6,395 D

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

HF + 6m 100W All-Mode

£1989 D

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

HF/VHF/UHF All-Mode Transceiver

Rig Only £899

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

£1295 D

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

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

100W HF Transceiver

£439 D

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

HF/VHF/UHF 100W Transceiver

Includes Travel Mite Dual Voltage PSU

£649 D

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

£449 D

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

Visit our eBay shop for more bargains!

eBay

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

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

IC-2725E £279 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**

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Come and see us at these great events in September and pick up a bargain...

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September 7th & 8th www.lars.org.uk
@ Donington International Exhibition Centre

Lowe Super Deal Day
September 15th @ Our branch in Matlock
see www.wsplc.com for more details

Telford Hamfest
September 30th www.telfordhamfest.co.uk
@ The Enginuity Centre, Coalbrookedale

Icom VHF/UHF Handhelds

ICOM IC-E91

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

Limited Offer **£199.95 C**

IC-V82 7W 2m Digital £159 C
IC-U82 70cms Digital £159 C
IC-E90 6/2/70cm £189 C
IC-T3H 2m 5W £129 C
IC-E7 2m/70cm Wide Rx £139 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=£6.05, D=£10, E=£12

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Freephone Orderline
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General Enquiries
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Online Catalogue
www.wsplc.com

MFJ

MFJ

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

Postage Options: A=£3, B=£4, C=£6.95, D=£10, E=£12

Practical Wirelesscontents

September 2007
On Sale August 9th 2007
Vol. 83 No. 9 Issue 1205
(October 2007 Issue on sale September 13th)

60 Practically Yours
75 Years of Heritage & History
Looking back at some rather special news items, articles and other material from the first issue of *Practical Wireless*, published on September 24th, 1932.


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September Regulars

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Cover Subject
Happy Birthday *PW*! 75 years and still going strong. Raise a glass with us to Britain's best and only independent Amateur Radio magazine. Make sure you enter our special birthday competition to be in with a chance of winning a Yaesu FT-450!

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Welcome! Each month Rob introduces topics of interest and comments on current news

Keylines

This month Rob Mannion G3XFD looks back at the last 75 Years of *PW* as well as looking forward to the future.

Throughout 2007, we've been celebrating the 75 years of heritage and history associated with *Practical Wireless* magazine. With such an illustrious history *PW* has seen the the UK's BBC grow from a radio broadcasting service to a world-wide entertainment service, as has seen the growth of television, the birth of radar, the expansion of Amateur Radio and countless other radio and electronic innovations. The past has featured a great deal in our dedicated supplement each month.

However, although everyone working on *PW* has been delighting themselves in sharing some of the heritage and history with readers world-wide, it's time to remind everyone that we are also looking into the future. Without its past, *PW* would not have the solid foundation of service to its readers. But now we're reached the peak of our celebrations (the actual date is September 24th, when we hope to be on the air with **GB75PW** from or near our offices), sharing them with readers at the Leicester Amateur Radio Show on Friday and Saturday, September 7th and 8th. After this we can look forward to a bright and fascinating future.

Very Special

I've always considered *PW* to be very special, indeed it's so special, it was featured in the BBC *Dad's Army* programme (Private Pike built a *PW* wireless project!) and the magazine is so well known it has often featured in newspapers, radio programmes and in TV and radio plays. In fact, *PW* has become an institution. However, even though an institution can often rely on its history and reliability for success, it's essential to also look into the future to ensure the success continues!

In wishing *PW* a 'happy birthday' and thanking the readers who have supported us so loyally in the past 75 years, I can assure you that everyone on the *PW* team is looking ahead. We plan to work with you to provide good reading for the future 75 years!

Although the present team and myself will be long gone by then, we can prepare the way for our successors by presenting *PW* in the best way to satisfy its readers. So, here's to the future!

Articles For Beginners

It's not often that we get a sustained level of extremely positive feedback from a letter or an Editorial in *PW* suggesting a particular article or topic idea. Obviously, we're used to reading the usual for-and-against comments after each issue has been published. Keen supporters of an idea will soon write in to register their support. At the same time we'll often receive opposing viewpoints and this enables us to provide as balanced a selection of opinions as possible within the letters pages.

The Editorial team does its best to work with readers, responding to comments and suggestions for new ideas, special articles and projects. Despite this, there are occasions when everyone in the Broadstone offices can be rather surprised. Indeed, I was rather surprised at the support for a new beginners series in the magazine. I found an E-mail from **Ross Woolgar M3OTU** to be particularly pleasing because we rarely hear from our younger readers!

The feedback on the letters pages from **Richard M0GDU** and **Bob G7NHB** has also helped as did the various other letters, E-mails, telephone calls and comments at club visits on the topic. I will now set about arranging the start of the new column and have one specialised author in mind – I hope he'll find time to write the column for us as it's quite a commitment! If all goes well the new column will start early in the new year. In the meantime, if you have suggestions, ideas and anything else for the new feature please let me know.

Again, I thank everyone for their interest and friendship. Without the help of supportive readers over the last 75 years *PW* could not have survived. Every reader is considered important – thanks for being there!

Rob Mannion G3XFD/EI5IW

services

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

Components For PW Projects
In general all components used in constructing *PW* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of *PW*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. See the Book Store page for details.

Placing An Order
Orders for back numbers, binders and items from our Book Store should be sent to: PW Publishing Ltd., Post Sales Department, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone 0845 803 1979. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone (01202) 659950. The E-mail address is bookstore@pwpublishing.ltd.uk

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

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.

Star Letter

What About Us?

● **Dear Rob**

I am a 15 year-old Amateur with the callsign **M3OTU** and think maybe its time to see more in *PW* for younger amateurs. I have been reading *PW* for over a year now and it strikes me that most of it is for the older generation of Amateurs.

What I think would be good, is an article or section dedicated to the younger Amateurs to explain stuff, how to make a simple receiver or even a demo page. Perhaps, even on a new radio or antenna that's been brought out and maybe someone around my age could test and rate the equipment?

I hope you will have a think about what I have put forward to you. But in the meantime *PW* is a very good magazine and I give it a rating 9/10 – the best Amateur Radio magazine on the market. Many thanks Rob.

Ross Woolgar M3OTU
Milford on Sea
Hampshire

Editor's comment: Thank you Ross! The Editorial team are pleased to receive feedback from a younger reader. Please join me on the Keylines page for further comment. ***Rob***

Beginner's Articles

● **Dear Rob**

I read, with interest, the letter from **Rob 2E0TFO** in the August issue of *PW* about the dearth of 'beginners guide' type articles and think he makes some very fair points. Every one of us was a beginner once – some more recently than others!

With the progressive licencing scheme there are probably more relatively inexperienced Amateurs on the air all at once than ever before. The Foundation Licence course is fine, so far as it goes, in making the student aware of the rules of the road. But what it doesn't do is equip the newcomer to make informed decisions about the choice of antenna for a given location, how to trace the source of EMC issues which 'can' arise (even with only 10W of power).

The course doesn't show how to get the choice of band and time of day right to maximise the chances of working a little bit of DX. These and the others things I've mentioned are the sort of thing you tend to learn from the school of hard knocks.

Unless the newcomer has the support of a friendly, more experienced Amateur, it would be all too easy to hit a simple problem that might appear to be insurmountable. They may even fail to find any DX and drift away disappointed in the investment of time and money.

If M3s are to progress through the Intermediate and then Full Licence courses, they mustn't be discouraged by problems at this early stage – and we're all in a position to do something about to help them! Not only that, I believe we all have a duty to do something about it, by offering whatever help we can whether it's technical help or simply moral support when it's all just too much to take in all at once. Sometimes, just 'being there' with friendly assistance is all that's needed to allow people the time and space to solve their own problems.

Locally in Bath, continuing support is very good – we're blessed with some most excellent instructors. (This is due to to **Steve G0FUW** and **Mike G3VTO** – thank you both!) and many other local Amateurs who are happy to continue their support beyond the official confines of the various courses. Their excellent example makes it all the more glaringly obvious it's not like that everywhere in the UK.

I feel a great many newcomers – not only M3s – would benefit from some support in the forms of practical articles in *PW* aimed at them. These could include advice on how to maximise results with a low-powered rig, choosing a suitable antenna for both the bands of choice and the particular location.

Assistance could also be provided on how to decide, which band to choose and when to use it, planning and safety issues around raising antennas, introducing digital modes, going portable and obtaining Notices of Variation for specific operations. It's this type of problem that it's easy for a more experienced Amateur to take for granted.

One possible format to consider, as well as more 'traditional' articles, could be Ask The Elmer. This could be a sort of problem page that has questions (either real or notional), answered by one or two experienced Amateurs, or specialists in the field the question addresses. It could also be thrown open to anybody else who wanted to answer (or take issue with the answers) in the next issue of *PW*. This approach could promote some healthy debate about various operating practices and possibly lead to some interesting investigations!

Giving a voice to the new blood, which is so vital to the continuing progress of our hobby will lead to some very good questions of interest to a great many of us – of that I am certain – and we have a duty to the craft to answer them to the best of our ability, while encouraging the technical investigations that will provide their long-term interest for, hopefully, many years to come.

Richard North M0GDU
Keynsham
Bristol

A most interesting and thought-provoking letter Richard – thank you. I also invite you to join me on the Keylines page for further comment. ***Rob***

Something For the Beginner?

● **Dear Rob**

With reference to the letter from Rob Styles 2E0TFO (*PW* letters August 2007), entitled Something For The Newcomer – I say a firm say "Yes"! It's a brilliant idea but you must keep it really simple for the absolute newcomer to our hobby. Many textbook writers seem to assume that the people trying to learn from them know quite a bit before they start! Things that are second nature to the experienced are often a closed book to the beginner.

letters

Even things like tuning up on the high frequency (h.f.) bands using a suitable antenna tuning unit (a.t.u.) – you and I know that a single sideband (s.s.b.) signal only has a tiny amount of residual carrier, so one has to be provided for tuning up purposes. The experienced Amateur knows this but does the newcomer know? That's the sort of thing I mean, the techniques that are not necessarily covered in a textbook.

Next, "Where does a low pass filter go in a transceiver antenna chain?" These and other very basic but practical things, are often those that puzzle the newcomer.

I know that there's a lot to learn after the Foundation Course but if the students can learn a few things beforehand it will give them a better start.

As a Registered Lead Instructor, I've found that trying to cover things that are not in the syllabus is not easy! Often we have to counter questions by saying that that particular subject is not in the syllabus but "we'll try to find time after the lesson." Twelve hours for the Foundation Course is a challenge anyway, especially if we are to include a good coverage of the practical assessment items.

Here in Plymouth, **Chris M5CJW** and I have concluded that fast track courses are not really the best way for most students. We feel that weekly lessons of a couple of hours are better so that the candidates have a week to absorb what they have learnt. We also find that after the lesson has finished the students have a lot of things that they want to discuss, often continuing the discussions out in the car park! Not to worry – it's that sort of enthusiasm we like to see and encourage.

So, again my answer is a definite "Yes" to a series for those who are keen but who know nothing. (They have a lifetime in the hobby to learn the technical bits!).

Thanks a lot for taking time to read this. *Practical Wireless* is, and always has been, a great magazine thanks to you and its staff. Keep up the good work! Finally, I'm looking forward to the newcomers article and I'll probably learn much that I should have learned a long time ago!

Bob Griffith G7NHB
Plymouth
Devon

Please see Keylines Bob! ***G3XFD***

Methods Of Volume Control Circa 1933

● **Dear Rob**

I am finding your vintage *Practical Wireless* article and pictures from the 1930s of great interest as I was a service engineer involved with most of the companies mentioned. I also have a copy of *PW* dated April 22nd, 1933 (Vol. 2, number 31), in which was published an article entitled Forms And Methods of Volume Control, written by me when I was 17 years of age!

If you do not have a copy of this magazine in your archives I can forward it if it's of interest to you.

John Sketch GW3DDY
Cardiff
South Wales

Editor's reply*: Thank you John! We do have a copy of your article in the archive and as a tribute to you I have taken the opportunity to devote the Topical Talk this month to you, honouring a remarkably long serving author and reader! Please join me on page 81.*

Energy Without Wires

● **Dear Rob**

A chap called **Marin Soljacic** at MIT in the USA appears to have found a way of transmitting magnetic energy without wires. At first, this sounds good but when I looked into this it appears that the technology uses waves in the 30m band (10MHz). I can now guess that all dyed-in-the-wool c.w. operators have now woken up!

Marin's experiment uses magnetic energy flow in what's called the near field. If you measure the field within one wavelength of the transmission source you find it is virtually all magnetic.

The question is, will they be able to contain it and not end up with electric fields developing further away thus potentially interfering with us and other users of the band? I have asked this question of Marin and await a reply.

Should anybody wish to communicate with Marin, his E-mail details are available on the MIT website (find it via Google). I also suggest that the RSGB and ARRL take an interest in this as it is a technology that might take off very quickly as it obviates the need for traditional wiring.

Mike Hall M0MGH
Worksop
Nottinghamshire

rallies

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

August 10th
The Cockenzie & Port Seton ARC Annual Junk Night
Contact: Bob Glasgow GM4UYZ
Tel: (0187) 811723
E-Mail: bob.gm4uyz@btinternet.com
Website: http://www.cpsarc.com/
The Cockenzie & Port Seton Amateur Radio Club is holding its 14th Annual Junk Night in the Community Centre, Main Hall, South Seton Park, Port Seton, East Lothian EH32 0BQ from 1830 to 2130hours. Bring along your own 'junk' and sell it yourself. Tables are on First Come First Served basis. There is disabled access, catering and the raffle will be drawn at 2100hours. The entrance fee is £1 for everyone. All money raised will be donated to the British Heart Foundation.

August 12th
The Kings Lynn ARC Rally
Contact: Andy G1KLP
Tel: (07778) 003687
Website www.klarc.org.uk
The Kings Lynn Amateur Radio Club Rally will be held at Kings Lynn Caravan and Camping Park, New Road, North Runcton PE33 0QR (approx two miles east of Kings Lynn on the A47). Gates open at 1000 and admission is £1. Talk-in via G3XYZ on 145.550MHz.

August 12th
The Flight Refuelling ARS
Contact: Mike M0MJS
Tel: (01202) 883479
Website: www.frars.org.uk
The Flight Refuelling Amateur Radio Society Hamfest will be held at Cobham Sports and Social Club Ground, Merley, Near Wimborne, Dorset BH21 1RJ. There is free car parking and the doors open at 1000.

August 26th
Milton Keynes ARS 21st Annual Rally
Website: www.mkars.org.uk
The Milton Keynes Amateur Radio Society's 21st Annual Rally will be held at Holne Chase School, Buckingham Road, Bletchley MK3 5HP. Doors open at 1000 hours. Visitors' entry fee will be £2, outdoor pitches £10 (or £7 in advance), indoor stands £12 (advance booking only).

August 26th
Torbay ARS Communications Fair
Contact: G4FCN
Tel: (01803) 812117
E-mail: rally@tars.org.uk
The Torbay ARS Communications Fair will be held at the Newton Abbot Racecourse, Kingsteignton Road, Newton Abbot, Devon TQ12 3AF. There will be trade stands, free car parking and a Bring & Buy. Doors open at 1000 and admission is £2.

September 2nd
Newhaven Fort Amateur Radio Group
Contact: Eddie
Tel: (01273) 300772
E-mail: eddie@zamboodle.demon.co.uk
The Newhaven Fort Amateur Radio Group will be holding their annual rally at Newhaven Fort, Newhaven, East Sussex. Doors open at 1030 and admission is £3.

September 7th/8th
The 36th Leicester Radio Show
Contact: Geoff Dover
Tel: (01455) 823344
E-mail: geoffg4afj@aol.com
The 36th annual Leicester Radio Show will take place at Donington Park with all the usual attractions and traders. Doors open at 0930 to 1730 on Friday and 0930 to 1630 on Saturday. A one-day ticket costs £3.50 Concessions (OAPs and under 16s) £3, two-day tickets costs £6 (concession price £5). Under 12s free when accompanied by an adult.

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off. Look out for representatives from *Practical Wireless* and *RadioUser* at rallies printed in bold.

A healthy letters page is always a good place to start each issue so if you wan't to praise someone or if you have a genuine complaint, please write in – you might win the £20 voucher awarded to the star letter! If you have good advice for fellow radio hobbyists or need some help yourself, don't hessitate to let us know – that's exactly what we're here for and we always welcome readers' input.

Don't miss out – Limited stock available so order today!

Read the facinating history of Amateur Radio in the first five issues of *Practical Wireless* from 1932!

PW 75th Anniversary Commemorative CD

Don't miss the opportunity to get a piece of Practical Wireless' history – for free – all you pay is a postage and packing handling charge of £2.

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In addition to the first five issues of *PW* the CD includes:
More Out of Thin Air – The best selling antenna construction handbook
Practical Power Supplies – A power supply construction handbook
PW Interactive – A selection of useful articles and information
How to Pass the RAE – A home study course, first published in *Radio Active*

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To take advantage of this great offer of a free CD, please complete the forms below. We will accept photocopies of the forms, as long as you include a **£2 coin** for your CD – **UK only (Overseas customers payment can only be made by a £5 Sterling Cheque/Bankers draft made payable to PW Publishing Ltd.**).

As one of the forms will be used as the return label, **please write clearly and use capitals**. Please note that stocks are limited, orders **must** be received no later than **September 28th, 2007**.
No orders can be accepted by telephone, FAX or E-mail.

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☐ Please tick if you do not wish to be contacted as a result of replying to this CD offer.

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**

PW Publishing Ltd. New Telephone Number

Please note that with **immediate effect** we have 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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Advance Training Course

If you are thinking of taking your Advanced Radio Amateurs Exam and live in South East London why not attend the following course? The course will take place at the **The Priory School, Tintagel Road, Orpington, Kent BR5 4LG**, on September 18th from 1930 to 2130 hours with **Alan Betts G0HIQ** as the tutor.

Enrolment is strongly advised as Advanced courses are a little few and far between. To ensure your place contact the **Bromley Adult Eduction College, Tel: 0208 460 0020** or via the Internet at **www.baec.ac.uk**

Kenwood Visit Martin Lynch

On Wednesday, June 27th **Mr M Sakai**, Product Planning (UK) and **Mr K Kuroiwa**, Software Applications from Kenwood Japan, visited the Martin Lynch & Sons store to promote the new Kenwood TMD-710E dual-band f.m. 144/430MHz transceiver. This important new transceiver is the replacement to the TMD-700E, which was very popular. The new model will be available just before the Donington Show, which takes place over September 8th and 9th.

Mr M Sakai, Product Planning (UK) on the left and Mr K Kuroiwa, Software Applications from Kenwood during their recent visit to ML&S.

New Website

The **Radio Society of Great Britain's Islands on the Air** (IOTA) scheme launched its new website on June 21st. The new site includes many improvements and contains new features including the ability to view your own record of confirmed island groups. Soon it will be possible for participants to claim additional credits on-line and to claim credit for IOTA Contest QSOs without the need for a QSL card verification.

The site has already proved to be a great success. Within the first week, 34,308 pages had been viewed, an average of about 4,900 per day by users in 64 different countries. The homepage, search page and island group information pages are the most popular. About 383 users have registered to use the QSO credits part of the site, of which 163 are new to the IOTA programme, proving the value of moving to an on-line management system. To find out more take a look at **www.rsgbiota.org**

The QE2 visits Scarborough!

The Scarborough Special Events Group will be on the air as **GB2QE** over the weekend of September 15th and 16th to mark the 40th anniversary of the liner *Queen Elizabeth 2.*

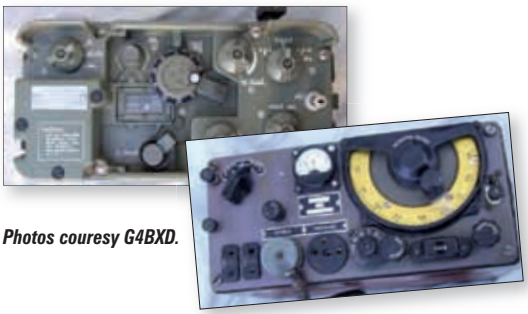
The *QE2* will be taking part in an historic round-Britain 40th Anniversary cruise and Cunard, the operators, have confirmed that the liner will make a detour from the normal shipping route to sail around Scarborough's South Bay so that holidaymakers and local residents can get a close-up view and say farewell to the longest serving ship in Cunard's history. The *QE2* will be retired next year and spend the rest of her days berthed at the Palm Jumeirah development on the coast of Dubai as a luxury hotel and museum.

The special callsign, **GB2QE**, will be activated around 3.725/7.055MHz s.s.b and 7.015/3.515MHz c.w. and v.h.f. A special QSL card has been designed to mark the occasion and can be obtained via the bureau or direct to Scarborough club call, **G0OOO**.

Friedrichshafen 2007

Ben Nock G4BXD took these photos at the Friedrichshafen Ham Radio show in Germany recently. They are just some of the delights he found in the flea market, which occupied three of the large hangar-type buildings.

There were many ex-military sets to be seen, from Second World war era to more recent sets. Components and accessories for both radio enthusiasts and computer users were in great abundance too. Ben's car was heavily loaded on the way home!



Photos couresy G4BXD.

International Lighthouse Weekend

During in the International Lighthouse Weekend, which takes place on August18th and 19th, **GB2SCA** will be active and aired by members of the Scarborough Special Events Group. A station will be set up in the lamp room in the Scarborough Lighthouse (ARLHS ENG-121).

Activity will take place on the h.f. bands around 7.055 or 3.725MHz s.s.b. and 7.025 or 3.525MHz c.w. All QSLs should be sent via the Radio Society of Great Britain's bureau.

Leicester Amateur Radio Show

The 36th Leicester Amateur Radio Show takes place on September 7th and 8th at Donington Park, Leicestershire. This will be the 25th show organised by the Leicester Amateur Radio Show Committee.

Although at the time of going to press (July 2007) the programme of events is still provisional there's a taster of what you can look forward to:

Friday September 7th

1100–1200	D-Star presentation by **Icom UK**.
1200–1300	What do you want from your Society? By **Angus Annan RSGB President** and **Peter Kirby, RSGB General Manager**.
1300–1400	Software Defined Radio –The next generation by **Peter Waters**.
1400–1500	Talksafe – Freedom for mobile communications by **Phil Osborne**.
1500–1600	Listening through the noise by **Graham Somervill**e of bhi.

Saturday September 8th

1000–1100	D-Star presentation by **Icom UK**.
1100–1200	Propagation and how to work DX using propagation prediction program by **Gwyn Williams G4FKH**.
1200–1300	Software Defined Radio –The next generation by **Peter Waters**.
1300–1400	Talksafe – Freedom for mobile communications by **Phil Osborne**.
1400–1500	Listening through the noise by **Graham Somervill**e of bhi.
1500–1600	RAIBC AGM.

In addition to the lecture programme, there will be the usual mix of traders ranging from the 'Big Three' – Icom, Kenwood and Yaesu to the well known dealers from around the country as well as the component traders. The show website is constantly being updated as traders confirm their attendance, so for the most up-to-date information see **www.lars.org.uk**

As usual, PW Publishing Ltd. will also be attending and members of the *Practical Wireless* team will put **GB75PW** on the air in honour of its 75th anniversary. **Elaine Richards G4LFM**, Editor of *RadioUser* will also be on the stand to answer your questions about the magazine.

There will be something for everyone, so why not go along? Doors open 0930 to 1730 on the Friday and 0930 to 1630 on the Saturday. Ticket prices are £4 for a one day ticket (under 16s and OAPs, £3.50) and £7 for a two day ticket (under 16s and OAPs, £6).

John Healey MP talking to the USA using IRLP.

Ministerial Amateur Radio

The South Yorkshire Repeater Group (SYRG) attended the Dearne Community Carnival held at Goldthorpe South Yorkshire on Saturday, July 14th, 2007.The Carnival was supported by the **South Yorkshire Community Foundation**, which funds charities in the region and are administrators of the Local Network Fund. Through the Foundation the SYRG were successful in obtaining a grant of £7,000 for upgrading the group's three repeaters and for Foundation licence training.

John Healey, MP for Wentworth in South Yorkshire and a Minister of State at the Department for Communities and Local Government (named 'floods minister' by the press) visited the group's stand. He was met by **Ian Abel G3ZHI** and told about the work of RAYNET and how Amateur Radio can be used, on behalf of user services in times of disaster. Ian also briefed him on the work of the Sheffield and Rotherham RAYNET groups in the recent South Yorkshire floods. John then spoke via a hand-held using a 144MHz IRLP Internet gateway link, hosted by **Bert G4NJI** in Rotherham, to **Bud KA9YPS** who is blind and lives in Indianapolis, Indiana, USA.

Anyone who would like more information on how to apply for a grant for their radio club or repeater group should contact Ian G3ZHI on **(01709) 799911** or via E-mail to: **g3zhi@hotmail.com**

First D-STAR Contact?

What is believed to be be the first Amateur satellite QSO using the new Digital Voice Mode, D-STAR took place on July 1st between **Michael N3UC** and **Robin AA4RC** using the AO-27 Amateur Satellite. The contact took place during the 2000UTC pass over North America.

The radios used for the contact were IC-2200s on the Uplink at both N3UC and AA4RC, an IC-2820 on the downlink at N3UCand an IC-91AD on the downlink at AA4RC. Doppler shift did prove to be a minor problem while using these radios. (The D-STAR signal would decode to about 1.5kHz in frequency error.)

The IC- 2820 would only tune on 5kHz spacing (the 6.25kHz channels did not fall in the right locations to help) so at times they could not decode the digital signals. It's hoped that future D-STAR radios will permit tuning in 500Hz steps. Further information about using D-STAR on Amateur satellites can be found at the AO-27 website: at **http://www.ao27.org/**

New Electromagnetic Compatibility Regulations

On July, 20th the new Electromagnetic Compatibility Regulations (EMC), Statutory Instrument 2006:3418, came into force. This is a result of the EU Directive 89/336/EEC being repealed by the new EU Directive 2004/108/EC.
Amateur Radio is mentioned in two places in this important EU Directive:

(2) Member States are responsible for ensuring that radiocommunications, including **radio broadcast reception** and the **Amateur Radio service** operating in accordance with International Telecommunication Union (ITU) radio regulations, electrical supply networks and telecommunications networks, as well as equipment connected thereto, **are protected against electromagnetic disturbance**.

And this directive shall not apply to:'...'(c) radio equipment used by radio amateurs within the meaning of the Radio Regulations adopted in the framework of the Constitution and Convention of the ITU (2), unless the equipment is available commercially. Kits of components to be assembled by Radio Amateurs and commercial equipment modified by and for the use of Radio Amateurs are not regarded as commercially available equipment.

The second item is important in that it means Amateur Radio kits are specifically excluded from the expensive and time-consuming process of complying with the Directive.

These new regulations apply to equipment placed on the market after July 20th, 2007. Equipment placed on the market prior to this date can continue to be produced in compliance with the old EMC Directive 89/336/EEC for a further two years.

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. There are no meetings in August but on Sept 4th there is a talk entitled No Radio Without Water by Dave Hicks; 18th: P roject night - Build a Crystal Set by Alan Hopkinson and 25th: International Short Wave League presentation by Geoff Hoyles.

KENT
Hilderstone Radio & Electronics Club
Contact Mike Howland G4MIX
Tel: (07732) 133230
E-Mail: g4mix@waitrose.com
Website: www.g0hrs.org.uk
The Hilderstone Radio & Electronics Club normally meet on the second and fourth Friday of each month at Hilderstone Adult Education Centre, St. Peters Road, Broadstairs CT10 2AQ at 1930 hours. However, would all members please note that there are no meetings during August due to summer holidays but they will resume in September.

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 doing 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.

Now on Air - GB3LK

A new 430MHz repeater is no on the air on the London-Kent border. Located at Chelsfield, near Orpington,**GB3LK** can be heard on 430.950MHz. The input is 7.6MHz higher at 438.500MHz. Access is enabled with CTCSS tone G (103.5Hz). Full details, including the specification, can be found on the website of its sister repeater, GB3OK, at: **www.gb3ok.com**

Pass Rate of 100%

The **Chelmsford Amateur Radio Society** (CARS) are pleased to announce that their candidates achieved a 100% pass rate in the recent Intermediate exam. This was the first Intermediate exam to be held under the new syllabus that was introduced following last year's licence changes. It meant candidates had to unlearn some of the regulations they'd learnt when doing the Foundation course.

As well as theory, there are several practical aspects to the Intermediate licence such as learning to solder and construct a radio. Having been introduced to home construction by the course the new 2E0s will, hopefully, be making some of their own radio equipment in the future.

The club has had to re-write many of the *Powerpoint* presentation slides to cater for the licence changes and the slides can now be freely downloaded from the club's website.

The CARS run the full range of Amateur Radio courses from Foundation to Advanced. Details are available from the training organiser **Clive G1EUC, Tel: (01245) 224577 or (07860) 418835, E-mail: training2007@g0mwt.org.uk Website: http://www.g0mwt.org.uk/training**

Special Birthday Competition

WIN! A FT-450 h.f/ 50MHz Transceiver!

Worth £700

To commemorate *Practical Wireless* reaching its 75th Anniversary year, **Yaesu UK** have joined in the celebrations and have given us one of their new FT-450 transceivers to give away to the winner of this easy-to-enter competition.

The FT-450 is described by Yaesu as a compact, (measuring 9 x 3.3 x 8.5in) yet superb h.f/50MHz radio with state-of-the-art IF DSP technology configured to provide world class performance in an easy to operate package. Whether you are a new licensee, casual operator, DX chaser, contester, portable/field enthusiast or emergency service providers… *This Radio is for **YOU!***

Weighing-in at 3.6kgs (7.9lbs), the FT-450 is designed to be used as a desktop radio at home or in portable applications. It can also be used mobile with the MMB-90 convenient mobile bracket accessory. Besides home or mobile operation, this easy-to-pack and transport radio is a DXpeditioner or emergency service provider's dream come true - compact, lightweight, high performance receiver and 100W on 1.8 through to 50MHz.

How to Win!

To be in with a chance of winning this great radio all you have to do is answer the three simple questions below, enter the answers on the coupon along with your name and address details and you'll be in the draw! All the answers, (except one) can be found on this page. For the missing answer you'll have to do some research!

Please return your completed entry (photocopies accepted but please include the corner flash!) to **Yaesu FT-450 Competition, PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** by **September 28th, 2007**.

Q1 What is the maximum power output of the FT-450?

Q2 How many memory channels and memory groups feature on the FT-450?

Q3 How many different mathematical algorithms are used to analyse and suppress different noise

Features of the FT-450 include:

- CW Features – built-in keyer, speed adjustable and training modes.
- Large easy-to read l.c.d. screen.
- A 10kHz bandwidth roofing filter in the 68MHz first i.f., right after the first mixer.
- Manual Notch filter
- Contour filtering system designed to suppress or enhance particular frequency components to improve the sound and/or readability of a received signal.
- Digital Noise Reduction (DNR) feature, which utilises 11 different mathematical algorithms to analyse and suppress different noise profiles encountered on the h.f./50MHz bands.
- Optional internal antenna tuning system available in the FT-450AT model
- Digital Microphone Equaliser – Custom set your rig to match your voice characteristics for maximum power punch on the band.

For more information and specifications take a look at **www.yaesu.com** or **www.yaesu.co.uk**

Our thanks go to **Yaesu UK Ltd**. for donating this great prize for *PW*'s Birthday issue. For more information on the FT-450 or any of the Yaesu product range please contact **Yaesu UK Ltd.** at **Unit 12, Sun Valley Business Park, Winnall Close, Winchester, Hampshire SO23 0LB, Tel: (01962) 866667, Website**: **www.yaesu.co.uk**

Yaesu FT-450AT Competition

Answers

Q1.....

Q2.....

Q3.....

Name.....Callsign .....

Address.....

.....

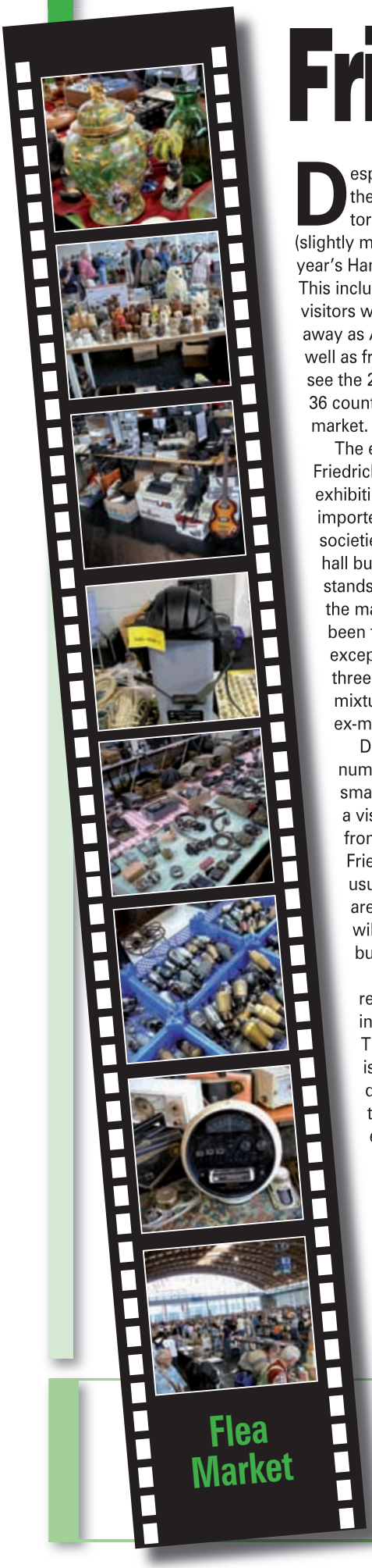
.....

Postcode.....Telephone (Daytime)

☐ Please tick if you do not wish to be contacted as a result of entering this competition.

Yaesu FT-450 Competition PW Sept 2007

Friedrichshafen 2007



Despite the really atrocious weather before the show – cold, gale force winds and torrential rain – just over 18,000 visitors (slightly more than last year) turned up for this year's Ham Radio exhibition in Friedrichshafen. This included a large number of overseas visitors who had travelled from places as far away as America, Australia and Japan as well as from all over Europe. They came to see the 207 exhibitors and associations from 36 countries and the 300 traders in the flea market.

The exhibition complex is right alongside Friedrichshafen airport and the main exhibition hall is where you find all the major importers, the dealers and the national societies of countries worldwide. It's a vast hall but about half of it was used for the club stands so it wasn't all dealers. However, the main attraction of this show has always been the flea market and this year was no exception – it was enormous. It almost filled three huge halls and it contained a good mixture of vintage radios, test equipment, ex-military items and assorted miscellanea.

Despite having almost the same number of visitors, this show is a lot smaller than Dayton but it is still worth a visit because it's a lot easier to get to from the UK. Ryanair now fly direct to Friedrichshafen from Stansted and flights usually cost less than £100. Hotels in the area are not expensive and a nice one will normally cost less than one of the budget chains in the UK.

Freidrichshafen is a popular vacation resort and many visitors were taking in the show as part of a longer break. The Black Forest is nearby, Switzerland is just a ferry ride away and a short drive alongside Lake Constance will take you into Austria. If you'd like to explore this part of the world and visit a superb radio exhibition at the same time or simply fly in for a couple of days just to see the show, the dates for next year are **June 27th, 28th & 29th, 2008**.

Interesting news at the show was the announcement of a rival to the popular SBS-1 virtual radar system. American company AirNav has launched their version, which they call RadarBox. It operates in much the same way and it has full integration with the Internet. Look out for a full review in a future issue of RadioUser. More details of RadarBox can be found at: http://www.airnavsystems.com/RadarBox/index.html

The innovative German designed and built Hilberling PT-8000A h.f./v.h.f. 100W p.e.p. transceiver created a lot of interest when it was first shown last year and the latest version has a host of new features. More details (in German) can be found at: www.hilberling.com or in badly translated English at: http://translate.google.com/translate?hl=en&sl=de&u=http://hilberling.com/hamrad/hamradio.htm&sa=X&oi=translate&resnum=2&ct=result&prev=/search%3Fq%3Dhilberling%26hl%3Den%26rls%3Dcom.microsoft:en-us:IE-SearchBox%26rlz%3D1I7DKUK

The flea market always has a lot interesting stuff on sale. Valves, war surplus, possibly the last eight-track player in the world, meters, microscopes, multi-coloured computer lights and even preserved butterflies!

In June, the small town of Friedrichshafen in southern Germany once again hosted Ham Radio, Europe's biggest Amateur Radio show and Roger Hall G4TNT was there for *PW*!

It's easy to see what's happening at this show!

The usual main manufacturers were there showing their latest models.

Valve and vintage enthusiasts would definitely have found something to buy at this year's show.

Good quality test equipment is always a feature at this show's flea market. It's not usually cheap but anyone looking to fit out a workshop will find everything they need here.

Graham Sommerville of bhi had another successful show selling his range of noise cancelling products on the W&S stand.

Martin Lynch enjoying the show.

Jeff Stanton of Waters & Stanton.

Connectors & Adapters

PL259/9 plug (Large entry) £0.75
PL259/9C (Large entry) compression type fit £1.95
PL259 Reducer (For PL259/9 to conv to PL259/6) £0.25
PL259/6 plug (Small entry) £0.75
PL259/6C (Small entry) compression type fit £1.95
PL259/7 plug (For mini 8 cable) £1.00
BNC Screw type plug (Small entry) £1.25
BNC Solder type plug (Small entry) £1.25
BNC Solder type plug (Large entry) £3.00
N-Type plug (Small entry) £3.00
N-Type plug (Large entry) £3.00
PL259 Chassis socket (Round) £1.00
PL259 Chassis socket (Square) £1.00
N-Type Chassis scoket (Round) £3.00
N-Type Chassis scoket (Square) £3.00
PL259 Double female adapter £1.00
PL259 Double male adapter £1.00
N-Type Double female £2.50
PL259 to BNC adapter £2.00
PL259 to N-Type adapter £3.00
PL259 to PL259 adapter (Right angle) £2.50
PL259 T-Piece adapter (2xPL 1XSO) £3.00
N-Type to PL259 adapter (Female to male) £3.00
BNC to PL259 adapter (Female to male) £2.00
BNC to N-Type adapter (Female to male) £3.00
BNC to N-Type adapter (Male to female) £2.50
SMA to BNC adapter (Male to female) £3.95
SMA to PL259 adapter (Male to PL259) £3.95
PL259 to 3/8 adapter (For antennas) £3.95
3/8 Whip stud (For 2.5mm whips) £2.95

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

PLEASE PHONE FOR LARGE CONNECTOR ORDER DISCOUNTS

Mounting Hardware (All galvanised)

Tripod-2 *(free standing with 2-OD for use with 2" joiner or 1.5" pole inside)* £69.95
Tripod-3 *(free standing with 3" OD for use with 2.5" pole inside)* £79.95
6" Stand Off Bracket *(complete with U Bolts)* £6.00
9" Stand off bracket *(complete with U Bolts)* £9.00
12" Stand off bracket *(complete with U Bolts)* £12.00
12" T & K Bracket *(complete with U Bolts)* £17.95
18" T & K Bracket *(complete with U Bolts)* £19.95
24" T & K Bracket *(complete with U Bolts)* £24.95
36" T & K Bracket *(complete with U Bolts)* £39.95
Single chimney lashing kit *(suitable up to 2 mast)* £14.95
Double chimney lashing kit *(suitable up to 2 mast)* £19.95
3-Way Pole Spider for Guy Rope/ wire £3.95
4-Way Pole Spider for Guy Rope/wire £4.95
Mast Sleeve/Joiner *(for 1" pole)* £6.95
Mast Sleeve/Joiner *(for 1.25" pole)* £7.95
Mast Sleeve/Joiner *(for 1.5" pole)* £11.95
Mast Sleeve/Joiner *(for 2" pole)* £13.95
Earth rod including clamp (copper plated) £9.95
Earth rod including clamp (solid copper) £19.95
Pole to pole clamp 2"-2" £4.95
Di-pole centre *(for wire)* £4.95
Di-pole centre *(for aluminium rod)* £4.95
Di-pole centre *(for wire but with an PL259 socket)* £6.95
Dog bone insulator £1.00
Dog bone insulator heavy duty £1.50
Dog bone *(ceramic type)* £1.50
EGG-S *(small porcelain egg insulator)* £1.95
EGG-M *(medium porcelain egg insulator)* £2.50
EGG-XL *(extra large porcelain egg insulator)* £5.95
CAR PLATE *(drive on plate to suit 1.5 to 2" mast/pole)* £19.95
PULLEY-2 *(Heavy duty adjustable pulley wheel)* £19.95

Cable & Coax Cable

RG58 best quality standard per mt 35p
RG58 best quality military spec per mt 60p
RGMini 8 best quality military spec per mt 70p
RG213 best quality military spec per mt £1.00
H100 best quality military coax cable per mt £1.25
3-core rotator cable per mt 45p
7-core rotator cable per mt £1.00
10 amp red/black cable 10 amp per mt 40p
20 amp red/black cable 20 amp per mt 75p
30 amp red/black cable 30 amp per mt £1.25

Please phone for special 100 metre discounted price

Baluns

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

Duplexers & Antenna Switches

DX-720D Duplexer *Port 1: HF + 6 + 2m (1.6-150MHz). *Port 2: 70cm (400-460MHz). *Connection: Fixed 2 x PL259 & 1 x PL259 ..... £19.95
MX-72 Duplexer *Same spec as DX-720D but with PL259 fly leads £29.95
MX-627 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz) £39.95
CS201 Two-way di-cast antenna switch. Freq: 0-1000MHz max 2,500 watts PL259 fittings £14.95
CS201-N Same spec as CS201 but with N-type fittings £19.95
CS401 Same spec as CS201 but4-way £39.95
CS401N Same spec as CS401 but with N-type fittings £49.95

Antennas Rotators

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

Complete Mobile Mounts

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

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

Antenna Wire & Ribbon

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

(Other lengths available, please phone for details)

Miscellaneous Items

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

Telescopic Masts (aluminium/fibreglass opt)

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

HF Yagi

HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts £399.95

ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM FREQ:10-15-20 Mtrs GAIN:8 dBd BOOM:4.42m LONGEST ELE:8.46m POWER:2000 Watts £329.95

ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m POWER:2000 Watts £599.95
40 Mtr RADIAL KIT FOR ABOVE £99.00

Mini HF Dipoles (Length 11' approx)

MD020 20mt version approx only 11ft £39.95
MD040 40mt version approx only 11ft £44.95
MDO80 80mt version approx only 11ft £49.95
(slimline lightweight aluminium construction)

HF Verticals

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

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

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

EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 5.00m RADIAL LENGTH: 1.70m(included) POWER: 800 Watts £299.95

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

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

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

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

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

ALL PICTURES ARE FOR REFERENCE ONLY

MOONRAKER

Manufacturers of radio communication antennas and associated products

Scanner Fibreglass Vertical Antennas

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

Scanner Discone Antennas

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

Scanner Mobile Antennas

G.SCAN II ★ Type: Twin coil ★ Freq: 25-2000MHz ★ Length: 65cm ★ Base: Magnetic/Cable/BNC **£24.95**

SKYSCAN MOBILE ★ Type:Multi whip ★ Freq: 25-2000MHz ★ Length: 65cm ★ Base: Magnetic/Cable/BNC **£19.95**

Scanner Portable/Indoor Antennas

SKYSCAN DESKTOP ★ Type: Discone style ★ Freq: 25-2000Mhz ★ Length: 90cm ★ Cable: 4m with BNC **£49.95**

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

Scanner Hand-held Antennas

Going out? Don't miss out! Get a super Gainer! p+p just £2.00

MRW-100 SUPER GAINER ★ Freq: 25-1800MHz ★ Length: 40cm ★ Fittiing: BNC **£19.95**

MRW-210 SUPER GAINER ★ Freq: 25-1800MHz ★ Length: 40cm ★ Fittiing: SMA **£19.95**

Scanner Preamplifier

A great pre-amp at an incredible new low low price!

MRP-2000 Mk2 ★ Active wideband pre-amp ★ Freq: 25-2000Mhz ★ Gain: 6-20dB ★ Power: 9-15v (battery not included) ★ Lead: 1m with BNC **£29.95**

Guy Rope 30 metres

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

CB Radio

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

MOONRAKER FA5000 PROFESSIONAL ★ 80 Channels (UK40 & CEPT40)★ Full 4 watts output ★ Dual watch facility ★ Full channel scan ★ Channel 9/19 priority ★ RF & Mike gain control ★ Frequency and channel LCD readout ★ Bar scale (RF power and RX signal) ★ 2 colour alternate back light ★ A beautiful top end radio with a whole host of features for just **£89.95**

Hand-held VHF/UHF Antennas

Postage on all handies just £2.00

MRW-300 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 21cm ★ Connection: SMA **£12.95**
MRW-310 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 40cm ★ Connection: BNC Gain: 2.15dBi **£14.95**
MRW-200 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 21cm ★ Connection: SMA **£16.95**
MRW-205 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 40cm ★ Connection: BNC Gain: 2.15dBi **£19.95**
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Project

The Huff-Duff Seven practical loop antenna

Geoff G3XGC poses with the completed prototype Huff Duff 7 loop project.

This version (above) of the Huff Duff 7 was built by Derek Brooks M0BNZ, who co-operated with Geoff G3XGC to take bearings on GB75PW.

High frequency (h.f.) direction finding is usually known by its acronym h.f./d.f., pronounced Huff-Duff. This has become the common name for a radio direction finding (d.f.) system and was coined during the Second World War, particularly for the high speed system used to detect enemy submarines that very briefly transmitted c.w. Morse signals back to their base while surfaced.

During the Second World War, the Huff-Duff system became very efficient and semi-automated versions, using multiple monitoring stations were able to obtain accurate bearings on moving targets that could re-submerge again rapidly. Many submarines were destroyed by aircraft that had been vectored on to the plotted positions.

There has been a recent outbreak of microphone scratchers and whistlers on the 7MHz band (see the Keylines Editorial *PW* May 2007). Apart from lowering the tone of genuine Amateur Radio operations, such transmissions cause trouble and the operators are in violation of the conditions their Amateur Radio licence (if indeed they possess one).

The *PW* Editor **Rob Mannion G3XFD** asked me to look into making a simple Huff-Duff antenna project **(**heading photographs and **Fig. 1)** to help reduce interference or to d.f. and locate the scratchers. Hence the name of this project is the Huff-Duff 7.

With a few people dotted around the country using the Huff-Duff 7, it should be possible to triangulate the position of offenders and hopefully get some action taken. The Huff-Duff 7 is also an excellent construction project for a short wave listener and can also be used as an aid to reduce unintentional interference (QRM) or electrical noise (QRM).

Into Service Quickly

The requirement was for a loop antenna which, when needed, can be brought into service quickly and used to take the bearing of a source. I have concentrated on a small hand-held loop that can be rapidly connected to a main station or portable receiver. The d.f. loop antenna is a very old idea and it consists of a parallel tuned circuit with inductor and capacitor values

Geoff Cottrell G3XGC describes a useful and extremely practical loop antenna system designed to counteract unintentional or deliberate interference to QSOs on the 7MHz band. The project's name pays tribute to an efficient direction finding system used in the Second World War to help detect enemy submarines when they transmitted while on the surface.

Fig. 1: Close up view of Huff Duff 7 number 1 (G3XGC prototype).

chosen to resonate at the required frequency, in this case 7MHz.

Why is a loop directional? To discover why, let's consider a radio frequency (r.f.) wave travelling towards an upright loop exactly along the loop's axis. The wave front is parallel to the plane of the loop and the electric field of the wave excites equal and opposite alternating current (a.c.) currents in its left- and right-hand halves.

There is no phase difference between the induced currents so they cancel giving a null output. But when the wave front is at any off-axis angle to the loop, there is a phase difference between the two halves. Cancellation of the two induced currents is no longer complete and a signal appears at the loop's terminals. The loop's response has a broad maximum when oriented edge-on to the source.

The Huff-Duff 7 relies on the sharp on-axis nulls for its d.f. ability. A nulled-out signal indicates that the r.f. wave is coming either from the forward or the backward direction. But from which direction is it coming? To resolve this ambiguity, I've also included an omnidirectional sense antenna that can be added to the loop signal. When the sense signal level balances that in the main loop, one of the two nulls vanishes and the loop has a cardioid response.

A push button and separate variable gain control determines how much of the sense signal is added to the main loop to achieve balance. With this, the forward and backward directions can be distinguished. Having found a null, a simple magnetic compass is used to measure the direction bearing of the source.

Initial Tests

My initial tests of a prototype two-turn loop of diameter 180mm, tuned to 7MHz, showed directional behaviour. But the received signals were quite weak when used with my Elecraft K2 receiver.

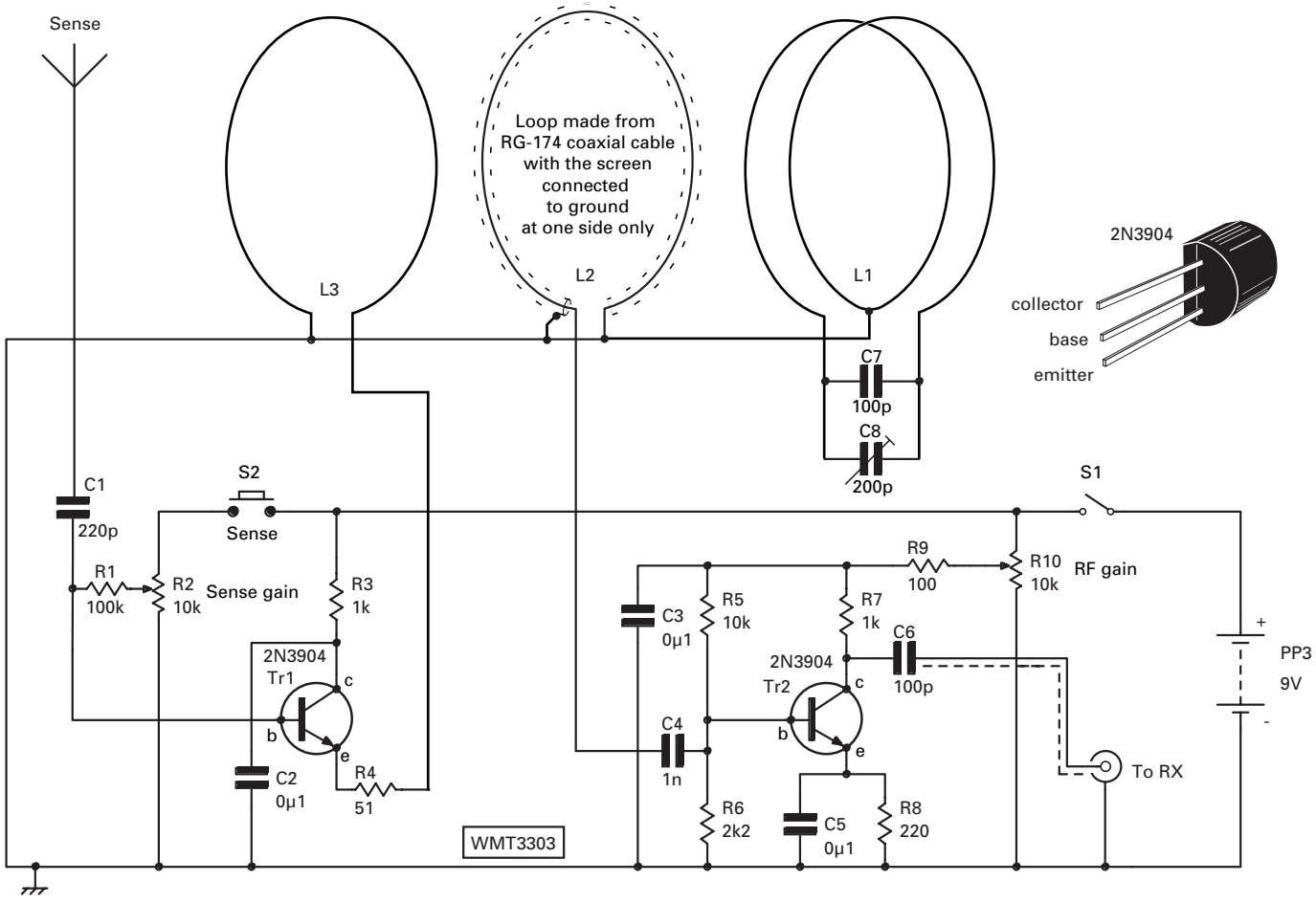


Fig. 2: The loop amplifier circuitry.

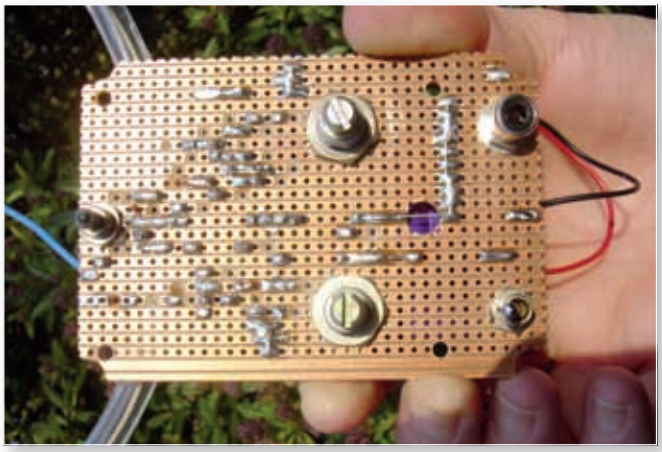


Fig. 3: Close up view of copper track side of the board.

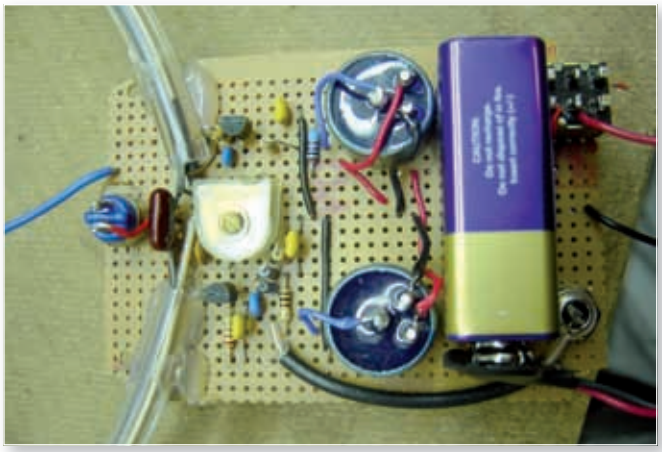


Fig. 4: Upper side of the board, showing loop ends secured with hot melt glue.

The loop is small, so its low output was not too surprising.

I added a single-stage variable-gain r.f. pre-amplifier (based on Tr2 in **Fig. 2,** onto Veroboard, **Fig. 3, 4** and **5**). The loop feeds r.f. to the pre-amplifier via a screened coupling turn, L2. The pre-amplifier increases the signal by up to 12dB and makes the band really comes to life. The sense antenna circuit consists of a short pick-up wire feeding a single-stage variable-gain amplifier (Tr1 in Fig. 2). The sense signal is coupled into the input circuit via an extra single turn (L3).

Construction Straightforward

The construction is relatively straightforward and the main d.f. loop (L1) consists of two complete turns (centre tapped to ground) of thin pvc multistrand wire. The pick-up turn (L2) is a single shielded turn of RG174 coaxial cable wound along with L1, as shown in Fig. 1.

The single sense coupling turn, L3, is grounded at one end. All the wires lie inside a plastic tube, bent into a circle. I had a spare length of plastic rod, used to adjust a venetian blind. This has an outer hexagonal shape and inner 4mm diameter hollow circular section.

I discovered that by immersing the rod in very hot water for a short time, it became very soft. So much so, that I was able to easily bend it around a circular former (the base of a saucepan!).

On cooling, the plastic tube retains its new circular shape. Any suitably sized plastic tube will do provided it's rigid enough to keep its shape. Whatever you do here, try to make sure that the loop is not warped. (Out-of-plane windings will degrade the d.f. properties of the loop.

Next, I prepared A 650mm long bundle of wires to form L1, L2 and L3 and this fed into the circular tube, leaving about 50mm dangling free at each end to form connections. At this stage, L1 consists of two separate wires – these could be identified later with an ohmmeter. The wires should be tensioned a little inside the tube to maintain geometry.

The Huff Duff 7 board was then fitted in a small plastic box (Fig. 1). A rectangular piece of matrix board, with the copper strips aligned with the long direction, was shaped to fit inside the box's lid, attached using four M3 bolts. After pre-drilling the board for major components, the plastic loop tube was attached to it with hot melt glue (Fig. 4).

The wires from the loop were then soldered to the board, keeping leads short. One central copper strip of the matrix board was chosen as ground. The two wires of L1 were grounded centrally to this strip, so forming a single centre-grounded and balanced main loop. The shield of the coupling loop L2 is grounded at only one side of the loop. The other end of the shield is not connected but the coaxial cable inner core is grounded at this end.

The r.f. output is taken from the inner coaxial conductor at the end where the shield is grounded. The sense antenna is an 180mm long insulated wire running from the board up to where it is attached at the top of the plastic loop. The positioning of the sense antenna is not critical. Once the large components (C8, S1, S2, Variable resistance R1 and R2, r.f. socket) have been fitted to the board (leaving space for the battery), the small components can be added. To complete this simple circuit, the copper tracks are segmented as required. A hand-held 4mm twist drill was used to remove a small amount of the copper.

Testing The Project

The first step is to connect the loop output to a suitable 7MHz receiver. The pre-set capacitor C8 then has to be adjusted for maximum received signal strength. (Loop resonance was obtained with a total capacitance, C7 + C8, of around 200pF).

Next, the r.f. gain has to be adjusted to give a satisfactory output. The 7MHz band should sound lively with many stations audible if all is well. Then, it's time to check that the loop's two nulls are present. (Find a strong and fairly continuous signal for this stage). Keeping the loop upright, rotate it about a vertical axis to confirm that the two nulls, (forward and backward) are present. They should be 180° apart and fairly sharp.

To calibrate the loop, the Huff Duff 7 I connected it to my Elecraft K2 transceiver. For a steady signal source, I set up a K1 transmitter, 50m away (using **very low power)** coupled into a 1.5m vertical wire. With the K2's automatic gain control (a.g.c.) switched off I measured the audio output voltage using a digital multimeter (DMM) set to a.c. volts. I then rotated the loop through 360°, noting the bearing, and plotted the received power in the diagram, **Fig. 5**. As can be seen in the diagram, the two nulls are clearly visible, 180° apart.

Setting up the Sense Circuit

Here it's important to balance signal levels by carefully adjusting the sense r.f. gain control. **Note:** I found that some experimentation is required to find the optimum setting.

When a null is found (using only the main loop) pressing the sense switch should remove the signal null in one direction, but not the other, where the signal should still be audible. In this state, the ambiguity of the loop can be resolved. Correct operation can be checked by rotating the antenna by 180°.

With the sense button depressed, the remaining null is fairly broad and imprecise. Therefore, the sense circuit should only be used to resolve the direction **and not the actual bearing**. The ear is good at hearing nulls as can be proved by gently oscillating the loop from side-to-side.

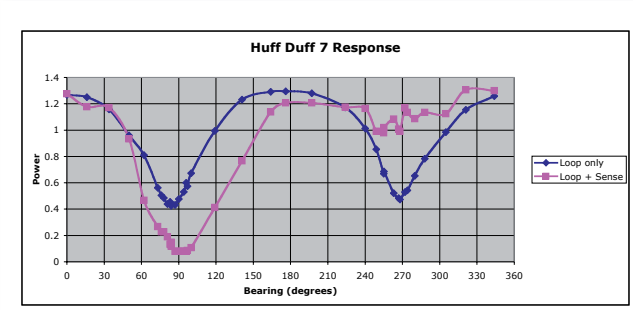


Fig. 5: Measured directional response (receiver power) for a full rotation of the loop at 7MHz using a test signal. For the main loop (dark blue) the forward null is seen at a bearing of 87° and the backward (rear) null is at 267°. With the sense antenna added (purple) the forward null is broader and remains while the backward (rear) null has vanished. The use of the sense antenna resolves the forward/backward ambiguity of the simple loop.

Huff Duff 7 Operations

To radio-locate an interfering station, a co-ordinated approach by two (or preferably more) operators, equipped and ready to use their loops, is required and this method is suggested in **Fig. 6**. During an agreed break in legitimate transmissions, leaving only the offender transmitting, each of the loop operators will take bearings. These bearings, and the locations of each receiving station, are then reported back to a co-ordinator who can use the data to fix the offender's location.

During this break in transmission, each operator switches their loop into their receiver and rotates the loop about a vertical axis until a null is found. Using a magnetic compass the bearing of the loop's axis, in degrees from magnetic North, is found and noted.

If there is time, the sense switch can then be deployed to fix which of the two possible directions the signals are coming from. This last step is, however, not essential because the triangulation method automatically results in an unambiguous fix on the source location. Nevertheless, it will help in giving some credibility to the measurement.

The loop should be kept in the null position while the bearing is taken. When this is done, it's important to remember that that the compass should not be placed near iron or other magnetic objects which can influence the reading and cause errors.
Apart from the ground-wave tests, I have also assessed the loop on air both during the day and after dark when the skip distance changes. It is quite easy to produce nulls on signals as far away as Germany and Russia. However, when fading is present this can sometimes deceive the ear into finding false nulls. So, care and practice is needed to get the best out of the Huff Duff 7!

Finally, I must gratefully acknowledge the help provide by my friend **Derek M0BNZ**, from Mullion in Cornwall. He built his version of the Huff Duff 7 and we both obtained test bearings on GB75PW when it was active from the **Poole Amateur Radio Club** in Dorset, as part of the development process. The Huff Duff 7 operates well with team work! ●

Component list:

These components were used in my Huff-Duff Seven. Other possibilities abound, depending on what's in your junk box!

Resistors (all 0.25W 5%):

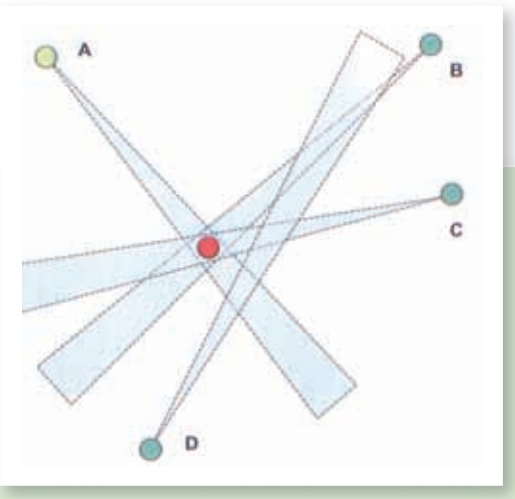
51Ω	1	R4
100Ω	1	R9
220Ω	1	R8
1kΩ	2	R3, R7
2kΩ	1	R6
10kΩ	1	R5
100kΩ	1	R1
Variable 10kΩ small linear		R2, R10

Capacitors (miniature ceramic, unless otherwise stated):
C1 220pF
C2, C3, C5 0.1μF
C41nF
C6 100pF
C7 100pF silver mica
C8 200pF trimmer

Other:
Tr1, Tr2, 2N3904
S1 Small push-to-make switch
S2 Small toggle switch
L1, L3, sense antenna. Thin stranded wire
L2 RG174 coaxial cable (500mm)
PP3 battery with snap-on connector
Phono socket (r.f. out)
Matrix copper strip board (90 x 67mm)
Knobs (2)
Plastic enclosure box (100 x 75 x 40mm)
4 M3 nuts and bolts.
600mm plastic tube about 4mm inner diameter (see text).

Further Reading
I have found some reference sources on the Huff Duff system
http://en.wikipedia.com
ARRL Handbook 2005 p.1319
QST Sept. 2005 p.36.

Fig. 6.



Technique

To plot a transmitter's position on a map, multiple directions are taken from stations A, B, C and D. The transmitter should be within an area, bounded by the overlapping beam-headings from stations (± heading errors). Directions from stations A, B and C agree fairly well but the heading from station D doesn't. It might be that station D has local objects causing beam distortion in that direction. The greater the number of stations, the more likely the result will be accurate.

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- New transparent box with LED indicators for the operation status
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- Operation from 3.6V Phone Batteries possible (current drawn <150mA)
- Software compatible with Windows and Linux operating systems.
- Save and Load of previous measurements
- Software for Pocket PC available

ML&S Price £184.95

palstar
ZM-30 Antenna Analyser

ML&S Price £289.95

The Zm30 is an automated micro-controlled SWR antenna analyzer with a 8 bit micro-controller with a precision low power DDS signal generator. It also includes a self-calibrating reflectometer and displays SWR at selectable frequencies from 1 Mhz to 30 Mhz. It measures: SWR, impedance, reactance, inductors and capacitors, transmission lines, stubs, Q, and resonant frequency. There is a serial port for field upgradeable software. Battery operated.

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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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Doing it by Design

This month, Tony Nailer G4CFY explains the design of a Top Band amplitude modulated (a.m.) transmitter and receiver. With the increased a.m. activity on 1.8MHz you'll soon be able to join in the fun!

In DiBD in the May 2007 issue of *PW* I considered transmitter configurations. The epilogue of that article hinted that a Top Band transmitter could be assembled from several of the modules mentioned in the article.

I also pointed out that a superhet transmitter duplicates similar modules of a receiver. So I'm now going to undertake a design study, on how best to produce a variable frequency oscillator (v.f.o.) controlled transmitter and receiver system for Top Band (1.8MHz).

In September, October and November, 2005 I published designs for the Mellstock 70MHz amplitude modulated (a.m.) transmitter and receiver system. Many of the parts used in that project can also be used here, including the transmit speech processor, the a.m. receiver integrated circuit (i.c.) and the audio amplifier.

Design Choices

The existing design of Portland VFO was designed to work in the range 7–10MHz. One possible system would be to use the v.f.o. tuning 8.700–8.890MHz with a double superhet, with a 10.7MHz first intermediate frequency (i.f.). This would give the full band range of 1.810–2MHz.

The alternative is to consider is a single conversion superhet with a 455kHz i.f. This would require a v.f.o. tuning 1.355–1.545MHz. While this is really great on receive it could be a problem on transmit, because a carrier at 455kHz fed to a mixer would inevitably produce harmonics at 0.910, 1.365 and 1.820MHz. The latter falls in the band and likely will create spurious responses on transmit.

The November 2006 **Radio Society of Great Britain** (RSGB) Band Plan, based on the Region 1 IARU Conference 2005,

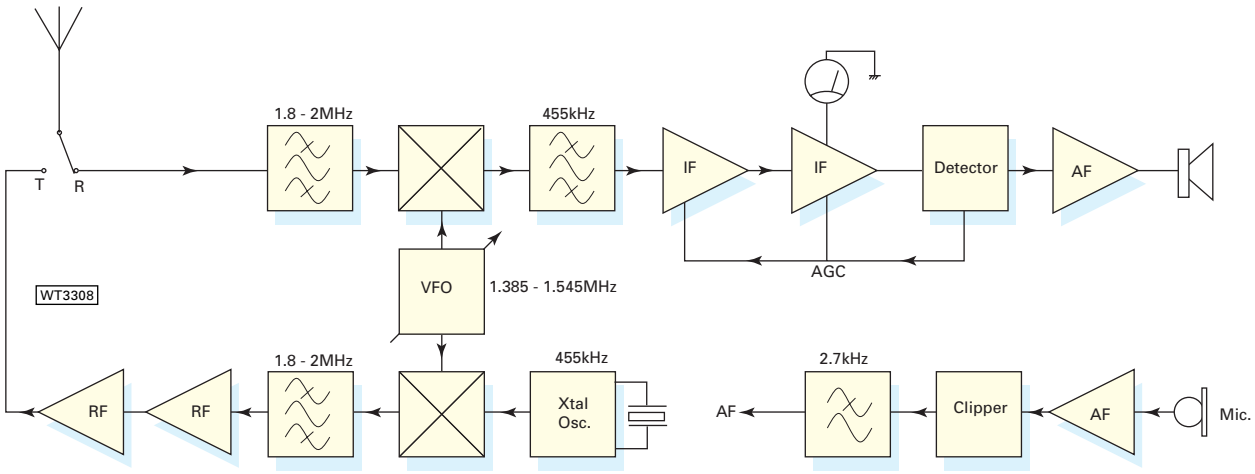

Fig. 1: Block diagram of the 1.8MHz a.m. transceiver.

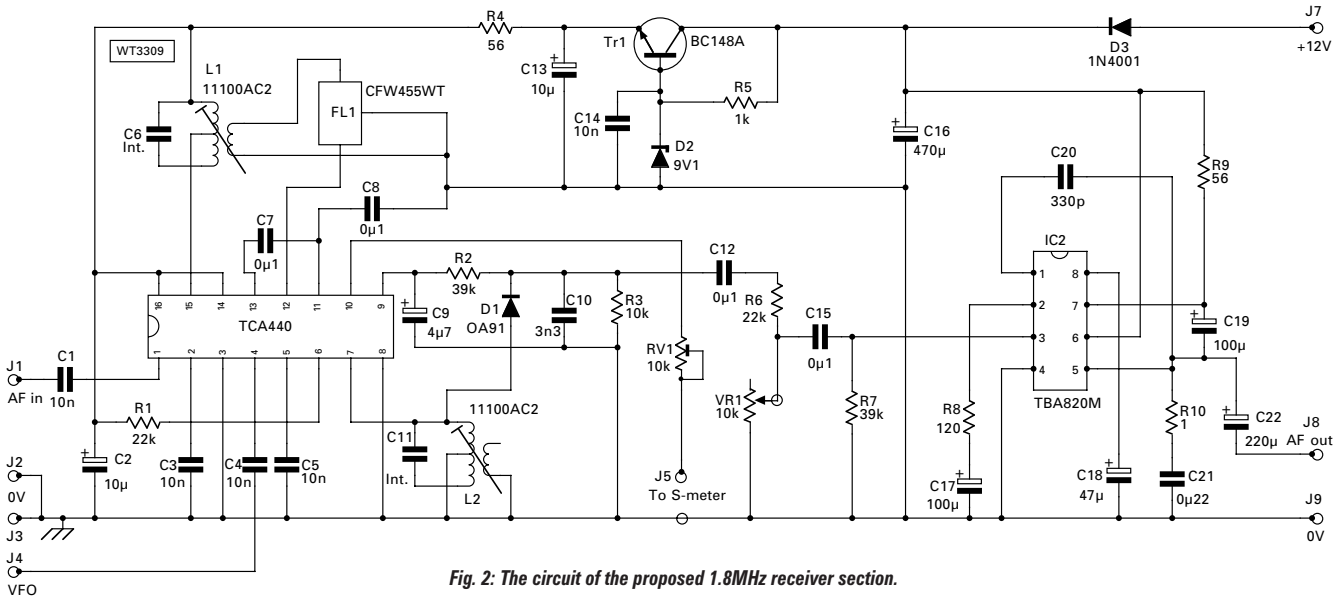

Fig. 2: The circuit of the proposed 1.8MHz receiver section.

Table 1: The November 2006 Radio Society of Great Britain (RSGB) Band Plan, based on the Region 1 IARU Conference 2005, divides Top Band as follows.

Band	Mode
1.810 – 1.830MHz	CW with bandwidths to 200Hz.
1.838 – 1.840MHz	Other modes with bandwidths to 500Hz.
1.840 – 1.843MHz	All mode with bandwidths to 2.7kHz.
1.843 – 2.000MHz	Telegraphy & Telephony bandwidths to 2.7kHz.

divides Top Band as shown in **Table 1**.

If the system is to include c.w. (Morse) then the 455kHz i.f. should be avoided. Clearly, an a.m. only system need only tune 1.840 – 2MHz, a range of 160kHz, and the 4th harmonic of 455kHz would not be a problem. The v.f.o. would need to run at 1.385 – 1.545MHz. It means a bit more work for me, as I have not yet produced a v.f.o. for that frequency range as a constructor's project.

From what I've described, there's a workable system that could be built, using single conversion on receive and transmit. A block diagram is shown in **Fig. 1.** No method of modulation has been shown, as I haven't decided yet whether to use an MC1496 a.m. modulator (low level), or power audio amplifier and modulation of the radio frequency (r.f.) power amplifier stages, (high level).

Receive Section

I'll now describe the receiver section and here the TCA440 a.m. receiver i.c. (as used successfully in the Mellstock project) will be put to work here again. It combines the functions of r.f. amplifier, receive mixer, the automatic gain controlled (a.g.c.) i.f. stage and S-meter driver.

The external component count is quite low and the internal architecture is very impressive. Together with the good-old-faithful TBA820M 1W audio amplifier, all else that's needed is a v.f.o. and a front-end filter.

In the Mellstock design, the main filtering was achieved using a pair of two-pole crystal filters at 10.7MHz. Subsequent i.f. filtering was done using a pair of two-pole mechanical filters.

With the design under discussion the main filtering has to be done at 455kHz. This can be achieved using CFW455HT filters which are cheap, have a bandwidth of just 6kHz, and provide 40dB attenuation at ±9kHz.

The front-end filter has the important job of limiting the range of signals that are applied to the mixer in the TCA440. The narrower its passband, the lower will be the intermodulation distortion created by that mixer.

The required bandwidth is 160kHz with mid point frequency of 1.92MHz. This represents a *Q* of 1920/160 = 12. A tuned circuit damped to accommodate the band would have poor rejection outside the band.

The ideal arrangement would be to use a tuneable pre-selector. This pre-selector could also be used on transmit by use of relay or diode switching. (It will be dealt with as a separate module). The circuit of the receiver is shown in **Fig. 2** and it's a trimmed down version of the Mellstock 70MHz a.m. design.

The LF Portland VFO

The Portland VFO (March 2006 issue *PW*) was developed to operate in the region of 7 to 10MHz. The principles are the same for a lower frequency version. The original Portland uses a TOKO K2027 coil with about 10μH inductance at a frequency of (let's say 8MHz). Then at half that frequency the inductance should be 4 times, say 40μH. At 2MHz the inductance then should be 4 times again, say 150μH. Now check the resonating capacitance at 1.385MHz.

C = 1/(39.5*f*f*L),

C = 1/(39.5*1.385MHz*1.385MHz*150μH)

Now one of the MHz cancels with the μH,

So C = 1 / (39.5*1.385*1.385*150*10^6),

C = 10^{-6}/11365 = 0.0000879μF = 87.9pF.

Now check the resonating capacitance at 1.545MHz.

C = 1/(39.5*1.545*1.545*150*10^6)

C = 10^{-6}/14189 = 0.0000707μF = 70.4pF.

Note the capacitance swing is 17.5pF. This is beyond the range of the back-to-back pair of BB809 varicaps used in the original design. Consequently, it will be necessary to use an air spaced variable capacitor, such as the 3.3 - 25pF C804 type from Mainline Electronics.

Now comes a difficult part! To re-calculate the capacitance to suit the 21.7pF swing of the C804. Let's try doing it by proportion. Previously, the 17.5pF swing represented an 8.75pF swing each side of 79.15pF. This represents a ratio of 9.0457:1.

So, with a 10.85pF swing each side, this should require a median capacitance of 10.85 * 9.0457 = 98.15pF. A capacitance range of 87.3 - 109pF.

Proof. At 1.355MHz, L = 1/(39.5*f*f*C) Henries,

L = 1 / (39.5*1.385MHz*1.385MHz*109pF) Henries,

Now the MHz*MHz cancels with the pF, so,

L = 1/ (39.5*1.385*1.385*109) Henries,

L = 121μH.

At 1.545MHz, L = 1/(39.5*1.545*1.545*87.3) Henries,

L = 121.4pF. (Really close!).

The minimum capacitance at the top frequency is 87.3pF. This is made up from

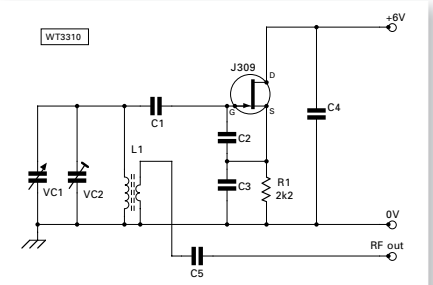

Fig. 3: The v.f.o. design used in developing the 1.8MHz project.

the C804 at minimum, 3.3pF, plus the bulk from the coupling and feedback capacitors in the Colpitts circuit together with a small amount from a 15pF Tetfer trimmer to allow correct band range setting. This, together with the coil core adjustment, will enable the correct range to be achieved. (A prototype circuit for the new v.f.o. is shown in **Fig. 3.).** With the Tetfer at mid range, together with the minimum of the C804, the remainder to be found is 76.5pF.

With the 8MHz version of v.f.o., I found that 150pF were suitable for the feedback capacitors. By proportion (at 2MHz) I will try approximately four times that value, at 560pF. This gives a series total for C2 and 3 of 280pF. If C1 is 100pF, then together with C2 and 3 the total is 73.68pF. If C2 and 3 were 680pF, then with the 100pF the total would be 77pF.

It all looks quite good so far, but what about the inductance? The TOKO suppliers don't have anything close to this value although there are 100μH and 158μH values. However, I have done some calculations with regard to re-winding some of my existing TOKO coils. It would need 108 turns of about 40s.w.g. wire on an old K2027 bobbin and clearly this could be a nightmare to wind!

Then I thought about winding up a toroid. No – please don't panic, I know of the aversion to inductor winding by readers! The intention was to use it in series with a lower value TOKO coil to allow inductance adjustment. Then I looked at the coil catalogue again and noticed type BKANSK4087HU with a mid-point inductance of 66μH and for this particular v.f.o. I could use two in series.

A data sheet found on the web showed minimum inductance of 59μH and maximum 72.5μH. (That will do nicely). The same inductor could be used singly in the future in a 5.0 – 5.5MHz v.f.o. A supplier was then found for the K4087 coils and a reasonable quantity purchased.

The Pre-selector

Having found a suitable coil for use at the Top Band frequencies I wondered if it could also be used in the pre-selector. This could be in the form of a pair of bandpass

coupled parallel tuned circuits. Maybe the polyvaricon type of medium wave tuning capacitor could be put to use here? (Nominally they have 120pF per section).

Using the K4087 coil with a mid range inductance of 66μH it's necessary to calculate the minimum and maximum capacitance at the top and bottom of the band.

C = 1/(39.5*f*f*L) uF, where f is in MHz and L in μH.

C = 1/(39.5*1.355*1.355*66) μF,

C = 0.000209μF = 209pF.

C = 1/(39.5*1.545*1.545*66) μF,

C = 0.0001606μF = 160.6pF.

The capacitance swing is about 50pF. Now if the polyvaricon had a capacitor in series with it, the swing could then be reduced to about 50pF. To calculate capacitors in series, Ct = C1*C2/(C1 + C2)

Let Ct = 50pF and C1 = 120pF. I won't bore you with the transposition, so please accept that:

C2 = Ct*C1/(C1 – Ct).

C2 = 50*120/(120 – 50) = 85.7pF.

To achieve this value, I used a capacitor of 68pF in parallel with 18pF. So, all that's now needed is the minimum value of 160pF. This could be made up with two 82pF capacitors in parallel with only a small error. A top coupling capacitor of a fifteenth of the total will be initially used. (The prototype circuit of the pre-selector is shown in **Fig. 4**).

It would be unwise to connect from the polyvaricon to the main board at high impedance. A more sensible approach would be to mount all the pre-selector components on a small board, and solder this onto the polyvaricon. Then connections to the main board can be from the low impedance link windings.

Pre-selector Switching

The pre-selector transmit-receive switching could be done with a relay, or using switching diodes. The latter method is quite elegant, is more reliable at low signal levels, and uses less power. A 1N4148 diode with 12mA flowing through it has a low forward resistance and should do the job.

The prototype circuit for the switch is shown in **Fig. 5.** It would make sense to also have these components mounted on the polyvaricon printed cicuit board (p.c.b.).

Transmitter Section

Let's now look at the transmitter section. I chose an S042P 4-quadrant multiplier as the transmit mixer. This well proven device achieves a suppression of 40db from one port to the output and a suppression of 26dB from the other port to the output.

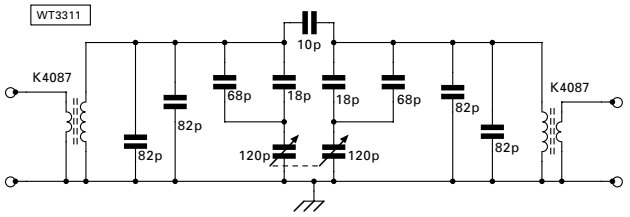

Fig. 4: The pre-selctor design that G4CFY is investigating and developing.

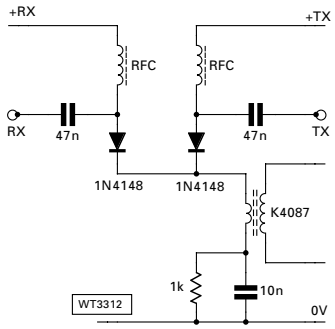

Fig. 5: The preselector transmit-receive switching ciruitry. Note: This is duplicated at each end of the pre-selector.

As the v.f.o. frequency is closer to the output frequency than 455kHz, I applied the v.f.o. to the port with maximum rejection. Residual feed-through of the two signals will then be reduced to insignificant levels by the pre-selector.

Low Level Modulation

In DiBD in the May 2007 issue of *PW,* I gave details of a suitable a.m. modulator, which used the MC1496, together with a simple negative supply generator. I decided to use that circuit as it fitted nicely between the 455kHz oscillator and the transmit mixer.

With low level modulation, the subsequent r.f. amplifier stages will need to be linear, so that the signal is not significantly distorted. Additionally, the power level at modulation peaks has to be within the dynamic range of the stages. For example, if the output stage can run 20W maximum, then the carrier power must be limited to 5W.

Following the mixer I like to use a m.o.s.f.e.t. to supply high gain to the small signal. It also has the advantages that it's very stable and the gain is adjustable. After this I've used a medium power r.f. stage running in class A to provide a few hundred milliwatts. Finally, there's a push-pull class B amplifier stage, with a 20W peak rating.

High Level Modulation

High level modulations is where a relatively high power audio amplifier is used together with a modulation transformer to modulate the d.c. supply to the driver and output stages. This is the technique used in the Mellstock transmitter and it could be done here using the same transformer.

The high level modulation arrangement only requires the r.f. stages to operate in class C and as a result are much more efficient, and easier to develop. The audio amplifier can be a TDA2003A device rated at 7.5W into a 3Ω load. Otherwise maybe a TA7205AP i.c., as used in the old style a.m. CB radios, would do the job.

The high level modulation techniques is the system I am tempted to use, as most of the pieces are already available. The driver and output stages would be single ended and could use bipolar transistors or power f.e.t.s

Initial Designs

Initial designs have been done for the receiver unit, the v.f.o., and the pre-selector. These will need to be breadboarded to prove them and to ensure nothing has been overlooked. However, the most difficult part of the whole project on this occasion is the r.f. power amplifier.

There's two months before the next issue of DiBD and I hope there will be sufficient time for me to experiment with class A and class C power amplifier stages for Top Band, and to choose one by its merits. I shall then perfect the v.f.o., the pre-selector, and finally the receiver.

The Top Band project may run to three issues but will result in a v.f.o. controlled a.m. transmitter and receiver system, hopefully with 5W carrier power and 20W peak power rating.

If you wish to correspond regarding this article or previous ones subscribe to the list **pw-g4cfy-on@pwpublishing.ltd.uk** by sending a blank email with the word subscribe in the subject box. When you receive confirmation from the server you can send an E-mail to **pw-g4cfy@pwpublishing.ltd.uk** and your comments will be answered by myself or the *PW* team. Cheerio for now! ●

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Count on us!

In the Shop with Harry Leeming G3LLL

This month, Harry G3LLL sets out to answer the question 'What's the best antenna and which one has the widest bandwidth and lowest s.w.r?'

One visitor to my shop, Joe commented "I won't be buying any of these 3.5MHz whips Harry. For less money I can get one that is smaller and has a lower s.w.r., together with a wider bandwidth."

In reply I said "Okay, I can do better than that, have you tried one of these?" and passed him a dummy load! So, If you think that a low s.w.r. and a wide bandwidth are necessarily good things, read on.

The diagram, **Fig. 1**, shows a simple tuned circuit using a separate coil and capacitor. The sharpness of its tuning is known as its *Q*, this is inversely proportional to the losses in the circuit. Whilst a fraction of the losses in any circuit will be caused by radiation, in a simple circuit like this, losses will be mainly due to the coil. The more efficient the coil is, the higher the *Q* and the sharper the tuning.

A 3.5MHz band quarter-wave vertical antenna is shown in **Fig. 2**. This is also a resonant tuned circuit, tuned by the inductance of the wire and its capacitance to ground. The sharpness of resonance *Q,* will once again, depend on the losses. If the vertical conductor is of very low resistance and is mounted over multiple earths with hardly any resistive losses, the main loss of energy will be via radiation, known as its radiation resistance.

The input impedance will be about 35Ω, the same as the radiation resistance and the s.w.r. at resonance will be 50/35 (about 1.4 1). The radiation resistance will dampen the tuned circuit giving it a fairly low *Q*, hence the bandwidth will be quite wide.

If, however, thin steel wire was used for the vertical section, with just a short earth rod for the ground connection, there would be considerable resistive loses. If these were also 35Ω, they would act in series with the antenna wire, bringing the input impedance up to 70Ω at resonance. The s.w.r. would then still be 1.4 to 1 (70/50) but because the tuning was more damped, the bandwidth would be greater. This antenna would be less efficient however, as half of the output power would not be radiated but would disappear in resistive losses.

A typical simple 3.5MHz mobile whip is shown in **Fig. 3**. Because it's much shorter than a quarter wavelength, it is brought to resonance by the coil and adjustable section. Its radiation resistance will be very low, about 1Ω but there will be considerable resistive loses due to the resistance of the coil and, especially if the car that it was mounted on, is parked on rocky ground. At 3.5MHz a car is a small and poor ground plane.

If the radiation resistance was 1Ω, and the losses were equivalent to 49Ω this would add up to 50Ω and the s.w.r. would be 1 to1. Such a high loss resistance would give good bandwidth but the efficiency would only be 2% with 98% of the transmitter's output disappearing in the losses.

If resistive losses were reduced to around 10Ω by using a better coil, wound with thicker wire, together with parking the car on wet ground to improve the ground plane, the antenna would then be around 10% efficient. The s.w.r. of this simple arrangement would now be 5:1 at resonance and the bandwidth would be very much narrower than before.

There are, of course, many ways of improving the s.w.r., efficiency and bandwidth of a mobile antenna. These included such as using a tapped base coil to act as a matching transformer and a centre loading coil. All things being equal, however, the mobile antenna with the least resistive losses, will tend to have the highest *Q* and the narrowest bandwidth.

Which Rig Is Which?

Prior to discontinuing the FT-101E, Yaesu brought out a new, rather upmarket valved p.a. rig, the FT-901DM. The FT-901 was a completely new design, which used a pair of S2001 valves, (the Japanese equivalent of the 6146B) in the p.a. stage. Due to the advent of all-transistor TV sets this change of p.a. valve was necessary, as the 6JS6C valve, which Yaesu had previously used in the p.a. stage of all the early FT-101s, was soon to be discontinued by the manufacturers.

The FT-901DM used multiple plug-in circuit boards like the FT-101 series but incorporated new features. These included such as a digital display, a memory, automatic keyer, peak and notch filters, pass-band tuning and switchable a.m. and f.m. (The FT-901DM included all these features but some were omitted and were optional extras in economy versions FT-901 and FT-901D).

The FT-101, like most rigs of its era, had been a double superhet and this did

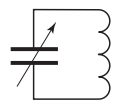

Fig. 1: A simple tuned circuit using a separate coil and capacitor.

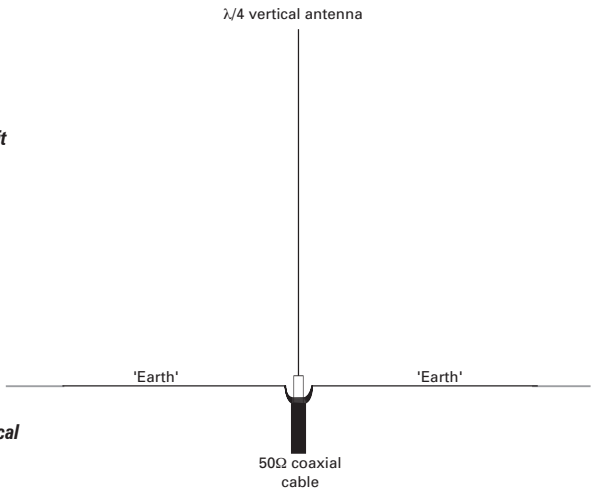

Fig. 2: A quarter-wave vertical antenna for 3.5MHz.

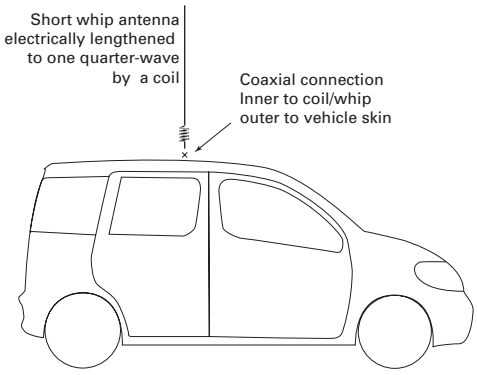

Fig. 3: A simple 3.5MHz mobile whip.

The FT-902 was an upgraded version of the FT-901 and featured an improved r.f. board and frequency counter.

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

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

make the receiver susceptible to overload. The FT-901 used only a single stage of conversion prior to the main selectivity and so was better at sorting out bands such as 7MHz, where weak Amateur signals occur near to powerful broadcasting stations.

Some time after the introduction of the FT-901, the new 24, 18 and 10MHz bands were announced. To cater for these, Yaesu upgraded the FT-901 to the FT-902, and as well as fitting the new bands they took the opportunity to replace the r.f. board and frequency counter with improved units at the same time. By this time, the S2001 valve was discontinued and so Yaesu had to go over to using a pair of American 6146Bs.

Antenna Tuning Problems

Antenna tuning units (a.t.u.s) have only a limited tuning range and in some cases they struggle if the load impedance is very high or very low. The answer to the problem that's often given, is to alter the length of the coaxial feeder to get a better s.w.r. – but is this the correct approach?

The s.w.r. of an antenna depends on the relationship of its feed impedance, to the characteristics of the feeder. If you feed a 14MHz band resonant loop antenna (which will have an impedance of about 125Ω) with good quality low-loss 50Ω coaxial cable, the s.w.r. on the feeder will be around 2.5:1 and there's absolutely nothing that you can do at the a.t.u. to alter this.

If the loss on the coaxial cable is low (see In the Shop August *PW)* and you measure the s.w.r. on the antenna side of the a.t.u., you **should** get a reading of 2.5:1, irrespective of the feeder's length. Altering the length of coaxial cable will not alter the s.w.r. but in some cases it may appear to change, as r.f. (flowing on the outside of the coaxial cable) can find its way into an s.w.r. bridge and cause it to give false readings.

While the actual s.w.r. will not vary, altering the length of the coaxial feeder can greatly alter the load that is presented to the a.t.u. If a feeder is electrically an even number of quarter wavelengths long, the impedance at one end will be exactly the same as at the other.

Solid core coaxial cable is electrically about half as long again as it is physically and so 3.3m of cable, is about a quarter of a wavelength on the 14MHz band. Connect twice this length of cable, (or four times this length, or any even number of quarter wavelengths) to the loop and the impedance at the a.t.u. end will be just the same as it is at the antenna.

Now, if you use an odd-number of wavelengths of coaxial cable to run from the a.t.u. to the antenna, then an interesting thing happens. The s.w.r. will still remain at 2.5:1 but the impedance at the a.t.u. end is no longer 2.5 times greater than the coaxial cable's impedance but it's **2.5 times** less than it. So, the 120Ω antenna impedance has been transformed down to an impedance of around 20Ω instead!

The s.w.r. will not have been altered but the impedance at the a.t.u. end can be set at anything between 125 and 20Ω just by trimming the coaxial cable. An antenna that is not resonant at the frequency in use, will also present a capacitive or an inductive load to the feeder. If the s.w.r. is not 1:1, exactly what reactance is presented to the a.t.u. and whether or not it is within the a.t.u.'s adjustment range, will once again depend on the length of the feeder.

In practice, trying to calculate what effect the feeder length might have on the matching capabilities of the a.t.u., is just too much like hard work. Trial and error methods by adding or subtracting one or more short lengths of feeder, let's say 1.5m lengths on 14MHz or 6m lengths on 3.5MHz, until things tune-up satisfactorily, is really the only way. It will not alter the antenna's real s.w.r. but it should enable you to tune the a.t.u. so that there is a 1:1 s.w.r. on the rig side of the a.t.u. and that the rig 'sees' a 50Ω load.

Balanced Output

Antenna tuning units with true balanced outputs, apart from the long-discontinued KW and SEM Z-Matches, are rather thin on the ground and most consist of an unbalanced a.t.u., which is fitted with an internal balun. These baluns are usually designed to match a 50Ω output to a 300Ω feeder line and as such many Amateurs think that they will be ideal for connecting to the length of ribbon feeder that goes to a G5RV,or to any other type of multi-band dipole – but they couldn't be more wrong.

A typical modestly price a.t.u. with balun, will be rated at about 300W but that is 300W into a matched load. A feeder with an impedance of 300Ω is often used as a tuned line, operating with a high s.w.r. ratio and typically the impedance where the line meets the balanced terminals of the balun in the a.t.u., can be anything from 10 to 3000Ω or more.

If on a particular band the impedance is 30Ω (for example), the current in the balun will increase by a factor of ten, if on an other band it is 3000Ω, the voltage will be ten times higher than anticipated. This means that if it is to safely withstand 100W, the balun in such a position should be rated at several kilowatts. Even if it is (and most are not), when operating outside its design impedance range it may well be quite inefficient.

My answer to the predicament is to follow the advice given many years ago by the editor of the long discontinued magazine *Ham Radio Today* and fit a 'Sorta Balun'. Never heard of one? More details next time. ●

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Feature

The Rochdale QRP Mini-Convention a continuing story

"Get interested in something. Shake yourself awake. Develop a hobby. Let the winds of enthusiasm sweep through you. Live today with gusto."
Dale Carnegie

Although a native of Lincolnshire and although I've worked in Nottingham and Birmingham, for the last 23 years I have lived in Rochdale, Lancashire. That far exceeds the amount of time I have lived anywhere else!

During the 23 years I have been Vicar of St. Aidan's church in an area called Sudden, on the edge of the town. It is a church with a good musical tradition; a large, well trained choir and a fine Father Willis organ.

About 20 years ago, it became evident that the organ needed re-building. It was a job that would require tens of thousands of pounds so, the inevitable fund raising began. Seeking to spread the load from the usual willing (but weary) givers, we looked at sources of income from beyond the church circle. My – half hearted – suggestion was that we could run an Amateur Radio event based at the church hall.

Rally Heyday

At that time Amateur Radio rallies were in their heyday and every Sunday most Radio Amateurs could find one or two within driving distance. But Sundays were out, for obvious reasons and I had grown tired of the sameness of radio rallies.

Fig. 1: David Stockton GM4ZNX examines a home-made transceiver during the Rochdale QRP Mini-Convention.

For me, the obvious way to run a local radio event was to link it with the G QRP Club and its accent on radio construction. If nothing else was achieved, I would find some useful parts and pieces of junk! So, through the G QRP Club and the Amateur Radio magazines, I announced that a G QRP Club Mini-Convention would take place on October 28th, 1989.

The event was to be a convention in that a programme of lectures would be added to the usual traders stalls. To follow the G QRP Club ethos, small and single traders selling components, surplus equipment and radio junk would be encouraged and traders of new commercial equipment would be turned away.

The plan was to put the traders in the church hall and hold the lectures in the church. I worked on an estimate of about 100 people turning up to what would be a rather specialist gathering in a modest sized venue. Helpers were recruited from G QRP officers and personal Amateur Radio friends.

The mini-convention exceeded all expectations. The attendance was double the estimate and the format seemed to please the attendees. So, what was intended as a one-off enterprise became an annual event! The convention now draws about 300 people each year including overseas QRP enthusiasts.

The Format

One of the problems of writing this article is that I have very little historical documentation of the Rochdale convention. The original format proved so successful that very little has changed over the years. All that I have to show for 18 years is one half-filled A4 folder to remind me of what we did in the previous year!

I am a great believer in not fixing what is not broken. The available space is not large, my time is limited, I have no commercial interest or ties and Amateur Radio is supposed to be fun so, the approach is purely k.i.s.s. (keep it simple stupid!).

Many radio rallies have elaborate catering facilities but the Rochdale convention relies on a few hard working wives who operate from a small but functional, kitchen. Much of the catering is based on one simple meal, the local

The Rev. George Dobbs G3RJV provides the background behind the popular event held in Rochdale ever year. George describes it as, "Eighteen years of Real Amateur Radio!"

Fig. 2: Johnny Appel SM7UCZ and his wife Birgetta (both on the right), socialise with Derry Spittle VE7QK (centre) and Henning OZ4XF.

delicacy of meat and potato pie served with mushy peas and red cabbage followed by apple pie. This is a fine local cuisine, eminently suited to Radio Amateurs seeking bargains and enlightenment. Other than that, snacks with tea and coffee are all that's available.

Amateur Radio traders always want a lot of space to display their wares! Every year most traders ask for more than one table and in spite of my standard answer, "I'll see what I can do," with the exception of one major component trader, everyone gets a single folding table.

The tables are arranged around the outside of the hall and the centre is filled with small tables and chairs for eating and socialising. This is part of the success as QRPers do like to meet each other and people can sit down, sometimes showing off their home-made equipment and always talking about what interests them.

The local radio club run a bring and buy stall in an adjacent room. Although a lot of the other stands are very similar with sales of used equipment, parts and an amazing array of surplus and junk.

From The Lectern

The mini-convention lectures are novel in that they are presented in the church from a fine oak lectern. In recent times, the lectern and microphone have been enhanced with a digital projector and screen.

The (perhaps) most unlikely people have found themselves taking on the format of a preacher in a church! The lecturers have been diverse and international. There are two regular speakers who have been present almost every year, **David Stockton GM4ZNX**, Fig. 1, presents his Open Technical Forum and *PW*'s own **Rob Mannion G3XFD**, conducts a regular Meet The Editor session.

Speakers from the UK have included well-known technical writers like **Ian White G3SEK**, **Peter Dodd G3LDO**, **John Hey G3TDZ** and **Ian Keyser G3ROO**.

Overseas lecturers have included notable Amateur Radio figures like **Roy Lewallen W7EL**, the designer of the EZNEC antenna software and **Paul Hardin NA5N**, of the VLA (very large array radio telescope) in New Mexico and an expert on propagation. Incidentally, the lectures aren't a bolt-on accessory, instead they are an integral part of the event.

Social Life

By nature, people with shared interests enjoy meeting each other. The social space at the convention allows attendees to sit down, enjoy a drink, some food and meet fellow QRP enthusiasts.

Faces are put to callsigns, favourite circuits are shared on scraps of paper, bargains are proudly shown off and annual meetings of friends take place. A surprising number of people arrange to meet others at the convention. "See you at Rochdale", becomes a common QSO exchange in the weeks leading up to the event.

The G QRP Club is a dispersed organisation, the officers come from all over the UK and the

Fig. 3: Counting the takings! Paul Hardin NA5N (centre), flanked by Derry Spittle VE7QK (left) and (right) Dick Pascoe G0BPS, Chairman of QRP Amateur Radio Club international (ARCI) busy in the vicarage after the convention.

members from all over the world. So, in theory, organising helpers for the event could be a problem. In fact, having helpers who travel long distances to offer their services has proved to be an asset.

A regular team of helpers, all QRP stalwarts, has grown over the years. Some stay at our house but most stay in the hotel across the road from the vicarage. We are lucky enough to have a large old house so it becomes the social centre for the gathered helpers. The activities at the vicarage form an important part of the convention for those who help to make it possible.

Three Days & More!

Although the convention only lasts for one day, the events around the vicarage last for three days and sometimes longer! Some helpers arrive on Thursday but Friday is the gathering day. Throughout the day, people check in at the hotel and come over to join us at home.

The early evening is spent setting out the hall followed by a shared meal. It's traditionally a large chilli using a special Texan spice mix sourced by **Glen Reid K5FX**. Glen is an old family friend who is a frequent attendee at the convention. Usually my wife, **Jo-Anna G0OWH**, dispenses chilli to over a dozen people and we settle down to an evening of Amateur Radio talk.

Saturday is the day of the convention and the helpers stay after it finishes to help clear the hall and restore the church for Sunday services. The weary helpers, with overseas visitors,

return to the vicarage for another tradition – a large Chinese meal.

One of our local Chinese take-away establishments benefits from the convention as suppliers of a Chinese banquet for around 25 people. Calling it a banquet is probably is probably talking-up the event, as in reality our large kitchen table (we can seat 12 around it) is filled with foil containers of food and everyone is issued with a polystyrene bowl and a fork!

The rest of the evening is spent talking radio and poking at pieces of equipment. On Sunday, many of the helpers join the congregation at St. Aidan's church and finish their trip with a shared lunch in the local hotel.

Amateur Radio Personalities

The Rochdale mini-convention has attracted a wide variety of QRP minded Radio Amateur personalities. From the beginning, rather curiously, it has attracted many overseas visitors.

Why they want to travel so far to a small scale radio event in a northern town in England has often puzzled me! Usually they comment that it's a unique event with a high social content.

Amongst the European visitors, **Johnny Apell SM7UCZ and his wife Birgetta, Fig. 2,** have probably been the most consistent. Johnny has frequently brought whole Swedish salmon and associated sauces to add to the food.

The late **Peter Halpin PH1PH**, for many years the G QRP Club Dutch representative visited the convention for many years up to his untimely death. **Dick Pascoe G0BPS**, **Fig. 3**, who is currently chairman of the American-based **QRP Amateur Radio Club International** (QRP ARCI) and his wife **Daphne** have attended and helped at every convention since it began.

Another surprise has been the number of visitors from North America. **Derry Spittle VE7QK**, designer of the Epiphyte QRP s.s.b. transceiver has attended most years from the beginning. Roy Lewallen W7EL, Paul Hardin NA5N, and Glen Reid K5FX, have already been mentioned above.

Fig. 4: Ken Evans W4DU and American QRPer K8DD.

Ken Evans W4DU, vice-chairman of the QRP ARCI has been a regular in recent years with other American QRPers like **K8DD**, **AC8W**, **K7RXV** and others I hesitate to omit. There must be something about the north-west of England radio parts and junk that appeals to the American heart!

The Rochdale QRP convention has certainly been a singular Amateur Radio phenomenon, not quite like any similar event. My time in Rochdale is drawing to a close as I retire next year (although, of course I shall continue writing Carrying On The Practical Way for *PW*!).

As I move away from St. Aidan's church, so will the convention. Plans are in hand for it to move to another venue and this may mean a different ethos but QRP enthusiasts are an adaptable species and it will, I'm sure, continue to prosper in the future. ●

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Carrying on the Practical Way

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This month, the Rev. George Dobbs G3RJV devotes his column to help you to start 'making it look good'. George has many ideas and suggestions to help you produce a project that looks its best!

"First appearance deceives many."
Ovid (Roman Poet 43-17 B.C.)

For me, part of the pleasure of home-brewed equipment is that it can look home-made! However, I may be in a minority because many home constructors take great pride in adding a professional look to their projects.

In fact, I use a different approach for projects that are made for fun and those that are made for permanent use. The latter, of course, require control labelling, perhaps with scales and a generally tidier appearance.

My comments may demonstrate that I'm perhaps not ideally suited to write about what follows – how to make an item of home-made equipment look good! Despite the possible disadvantage, all I can do is offer a few of my ideas on the cosmetics of home-made radio projects.

Suitable Housing

The first requirement is to find a suitable housing for the project. Those with metalworking equipment and expertise will be able to fabricate their own custom cases and I suspect that applies to few constructors (certainly not me) as I'm a poorly skilled metalworker.

Several constructors I know fabricate their own cases by using panels made from blank printed circuit board (p.c.b.) material. It's easier to work with than using most types of metal, although cutting straight edges requires some careful sawing. A mitre board can help to make the resultant cut more accurate.

I have successfully joined the sides of such cases with solder, using a high wattage soldering iron. Mounting little right-angled triangles of p.c.b. material at the corners helps to get the sides nicely aligned.

Another easy approach is to take the case of a piece of discarded commercial equipment and add a new front panel. In the past, I've often used p.c.b. material to replace a front panel. It can be cheaper and is certainly easier to work than a replacement metal front panel.

Most amateur constructors would probably prefer to use a new metal case for their pet projects. Unfortunately, commercially-produced cases can be very expensive. In fact, the cost of a case plus knobs and other panel mounted hardware can be greater than the cost of the electronics inside the case!

Like many other constructors, I have usually opted to use the clam shell type aluminium cases, which are available in a variety of sizes. One UK stockist is **JAB Electronics**. Although made from bent aluminium sheeting these cases are sturdy and rigid.

Easy To Work

Aluminium is relatively soft and easy to work. In fact the problem is that it's too easy to work and tends to show the scratches and marks of the less experienced metal worker.

It is difficult to drill an accurate round hole in an aluminium panel. A fast drill speed with a slow feed rate does help but the best method is to drill the hole under-sized and increase the diameter with a hand reamer. My best advice is that you should **never** (ever) begin to fabricate a control panel before you have laid out the actual controls to see if they'll fit! The more astute constructor will also consider ergonomics and choose to put controls and indicators in the positions that help the user to operate the equipment.

Assuming the front panel has been prepared the next stage is deciding on a finish and labelling that will be functional as well as attractive. Painting, by hand or spraying, is one option although do not expect car spray paint to stick to aluminium without a good priming layer (or layers as required).

Many seasoned constructors have their favourite way of preparing aluminium to take a durable layer of paint. Even so, it is likely that scratches or marks may show through the paint. For this reason, I used a method that does away with the use of paint on front panels. I use paper or thin card, to finish a front panel and I'll now briefly describe the process.

Panel Complete

When the front panel is completed remove all the controls. Place the front panel, face down, on a piece of white or lightly coloured paper or thin card; I find thin card is best.

Using a ball point pen from the back

side of the panel, mark out the perimeter of the panel and all the control and other hardware holes. Press down hard on the pen, so that the positions can be seen through the paper or card. Turn the card over to the front side and add the required labelling. This could be done with rub-down lettering, water-slide transfers, stencils or even by hand.

The next stage is to attach the false front and give it a durable finish. Carefully cut out the panel to exact size and lightly glue it on the metal panel using Pritt Stick adhesive. The front panel is protected from the elements and dirty fingers by adding a layer of clear plastic film.

The sticky backed plastic transparent library film is ideal for the task. Although using film does take a little care to prevent bubbles and kinks, the finish is durable.

Overlapping the film around the edges of the panel helps to keep the card in place. The final stage is to cut out the holes. This is best done from the front using a pointed modelling knife or scalpel. Care must be taken when tightening nuts on the controls to avoid twisting the card and film. Placing washers under the nuts is helpful, as is tightening from the back whenever this is possible.

These days many constructors use computer software and a printer to produce legends for their equipment front panels. When I use this method I follow a different approach. (I lay out the panel on the computer first and do a print on a piece of paper).

The paper may be taped on to the panel and used to mark out the positions of the holes with a centre punch. This is easier than attempting to get the spacing correct on the computer after drilling the panel.

There's various pieces of software suitable for making printable front panels. In the past I have often used *MS Publisher*, others use *PowerPoint* and the brave use *MS Paint,* which comes with all versions of *MS Windows*. Recently, I bought a copy of *Front Designer* by abacom; an excellent and reasonably priced program, which allows for custom scales and symbols.

Transferring Design

Several methods may be used to transfer the computer design to the actual front panel. Perhaps the simplest is to follow the thin card and transparent film method outlined above? I have also had good results by cutting out the printed design to the size of the panel and laminating the printed sheet using an electric laminator.

A method that I have begun experimenting with, is printing the design on to inkjet overhead projector transparency film. The *Front Designer* software will print a mirror image that shows through the transparency, so the printed side can be mounted towards the panel with the back providing protection.

Attaching the transparency face down to the panel is best done with pva (polyvinyl acetate) adhesive. Although it's milky when applied, the adhesive dries clear and transparent. As pva adhesive is water based, it can be diluted if required. The panel may be painted or covered with paper or card to form the background.

Pete Keirle, a *PW* reader in Somerset, sent me a couple examples of the attractive circuit board he produces, **Fig. 1**. They are built on Veroboard but looking from the top they appear to be professional boards with a component overlay.

Pete designs his overlay panels using *MS Paint* and prints them with an inkjet printer on photo quality paper. Because the component outlines in his self-made library of are larger than actual size, he scales them down with printer commands. The printout is attached to the top of the board using Pritt Stick adhesive, aligned to the holes by holding the board to a light. This process would work well with perfboard (my preferred method).

The example shown in the photograph is a precision 1kHz sine-wave oscillator. There was almost a risk of there not being a practice circuit in this month's column, so I have included the circuit of the oscillator, **Fig. 2**.

The project is the familiar Twin-Tee design with adjustment of the main parameters. Since Pete's circuit boards put mine to shame, I am sure many readers will outshine my front panel efforts! Cheerio until next month. ●

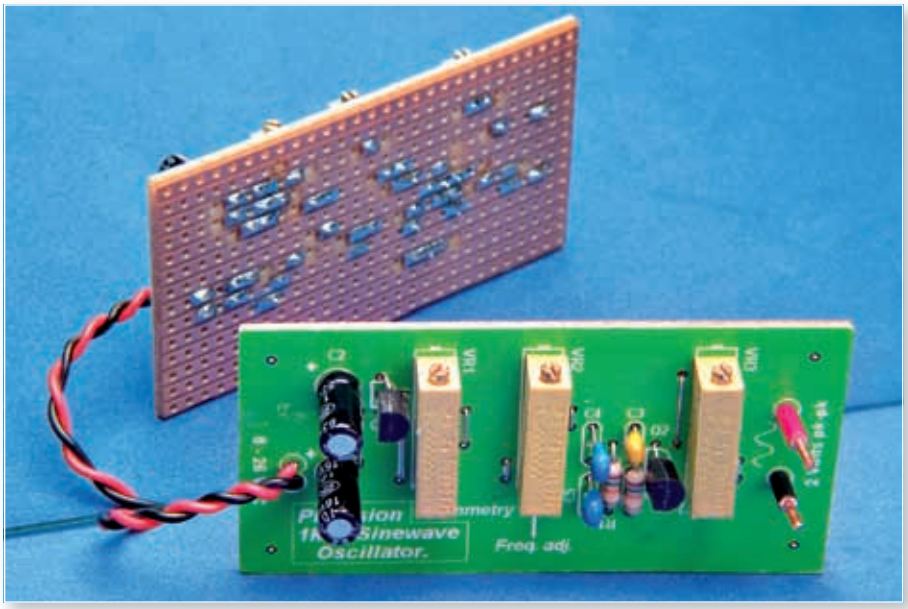


Fig. 1: Pete Keirle uses Veroboards to make a form of p.c.b.

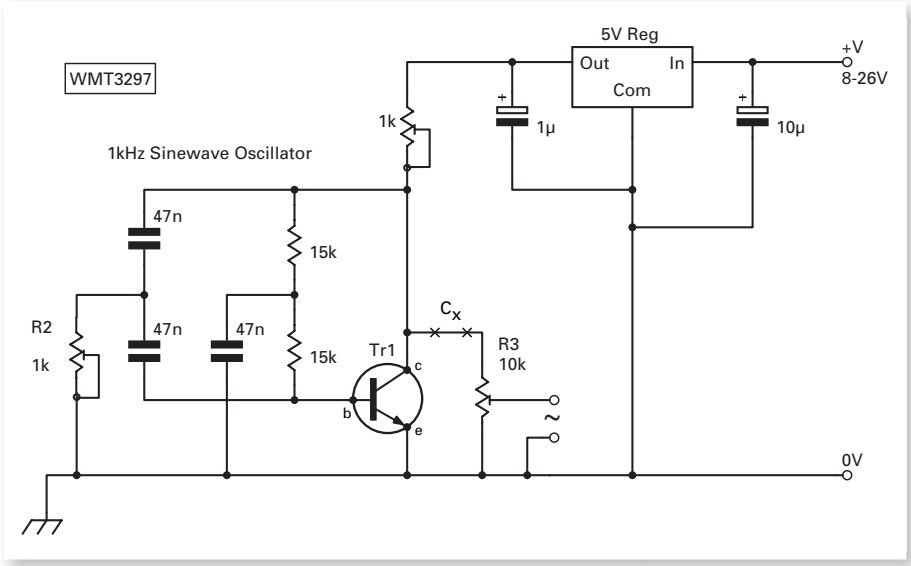


Fig. 2: The circuit of the Twin-Tee oscillator.

Project

Solid State CQ-Box

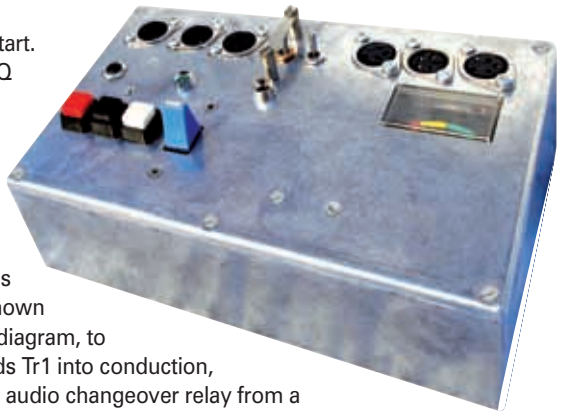
Many of the newer transceivers offer built-in digital recording systems to provide automatic rendering of those endless CQ calls that are often required in contests today! The *PW* QRP Contest in June is no exception! Many of the smaller more portable rigs, however, need some sort of add-on unit if your throat is to be preserved by the end of the day.

The unit I'm describing is the latest in a line of gadgets stretching back 15 years or so. The earlier ones involved cassette players. The last one, built in 1999, was solid state but was difficult to control and re-record the message. It also had only one message segment available, so I decided it was time for an upgrade.

The heart of my new system is the Milford Instruments Sound Card 1-480. This is a ready-made item using an ISD/Winbond speech storage chip controlled by a PIC and sadly it's not cheap at around £35.

Circuit Interconnections

The interface unit's circuit and interconnections, in **Fig. 1** and **Fig. 2**, controls the push-to-talk (p.t.t.) functions. If 'B' is grounded, the gate changes state and pin 3 of IC1 goes high, which causes pin 10 of IC2 to also go high, putting Tr2 into conduction, closing Relay 2 and operating the IC-706 p.t.t. contacts. Pin 3 goes high and also drives Tr3 into taking the End of Message (EOM) line 'A' low. This stops any CQ in progress or inhibits any start.



When a CQ message is replayed the green l.e.d. illuminates. And 5V is taken from the l.e.d series resistor, as shown on the block diagram, to 'M'. This sends Tr1 into conduction, operating the audio changeover relay from a normalised microphone condition into CQ audio. At the same time, pin 5 of IC1 goes low causing IC2 output to go high and operates the p.t.t. relay.

The exclusive OR stage (XOR) IC2 combines the p.t.t./microphone and the p.t.t./MSG states and ensures, if for any reason both go high, the output at pin 10 drops to low. This stops the p.t.t. to the '706 rig.

The CQ audio is taken from the ISD pin 14 by single ended feed to 'J'. The 10kΩ 'stands it off' from the balanced output of the chip and the 10nF blocks any d.c. Further attenuation and matching are by the 1kΩ and 12kΩ. Some finer trimming is provided by the 4.7kΩ variable. The 10μF capacitor blocks the d.c. polarising volts for the electret microphone coming up the IC-706 audio lead.

The second set of contacts on relay RL2 are for future control of a 70MHz transverter. These are brought out to a 3.5mm socket.

Shown as an inset in Fig. 1 are the components for providing d.c. polarising voltage to the external microphone capsule. These are designed for my '706 and the electret microphone and could be different for other transceivers.

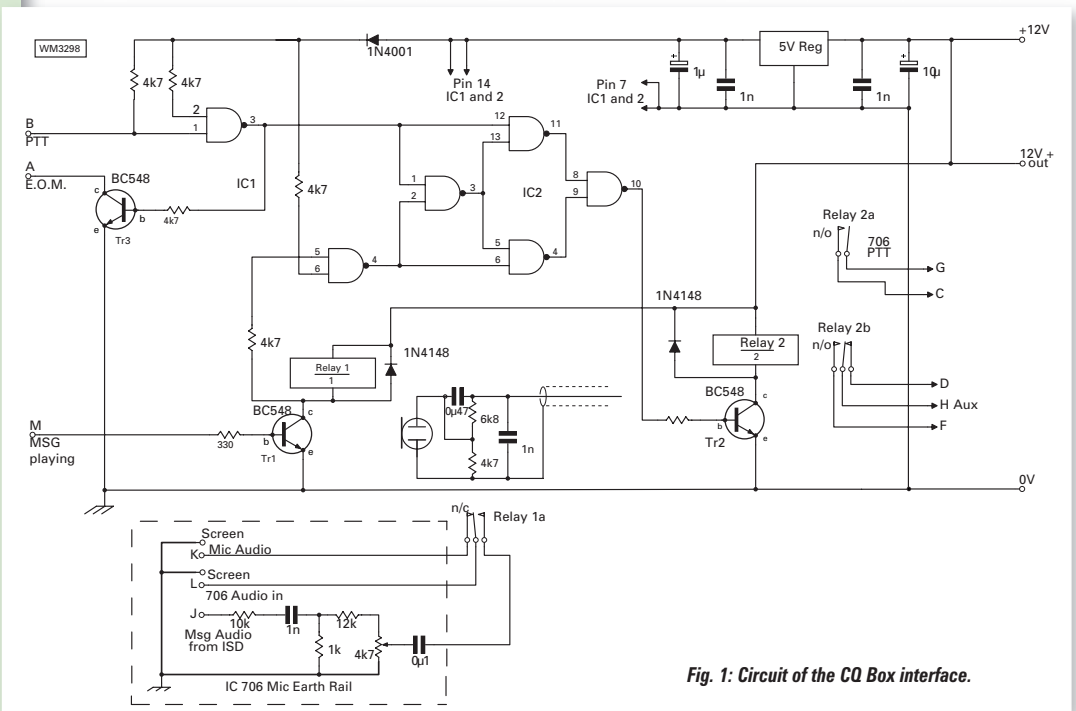


Fig. 1: Circuit of the CQ Box interface.

Earth Systems

Just a little note here about 'earth' systems on radios. The IC-706 would appear to have three!

a) The main +12v and -12v supply rail

Tony Crake G0OVA likes the idea on contesting but hates having to repeat a CQ call, seemingly endlessly. So, here's his answer – a CQ–Box that does it for you!

b) The system earth for p.t.t.
c) The screen of the microphone lead

On my interface design all three of these earth systems are kept apart. I have found it is best not to mix them up or some disappointing results may occur such as a buzz or r.f. instability.

My CQ-Box, **Fig. 3** and **4**, was made to go with my IC-706MkIIG, so to fit other rigs you'll have to change the pin-out wiring where applicable. To this end, there are no dedicated pins shown on the connectors in the block diagram. The main illustration shows a meter and three 4-pin DIN sockets on the right-hand-side. Any of these items may be omitted if they're not required.

After recording, you may need to review the message on the internal speaker. As the green l.e.d comes on it will cue up the p.t.t. line! The switch S2 is mounted alongside the REC/REP control isolates the p.t.t. line and prevents this potentially embarrassing moment.

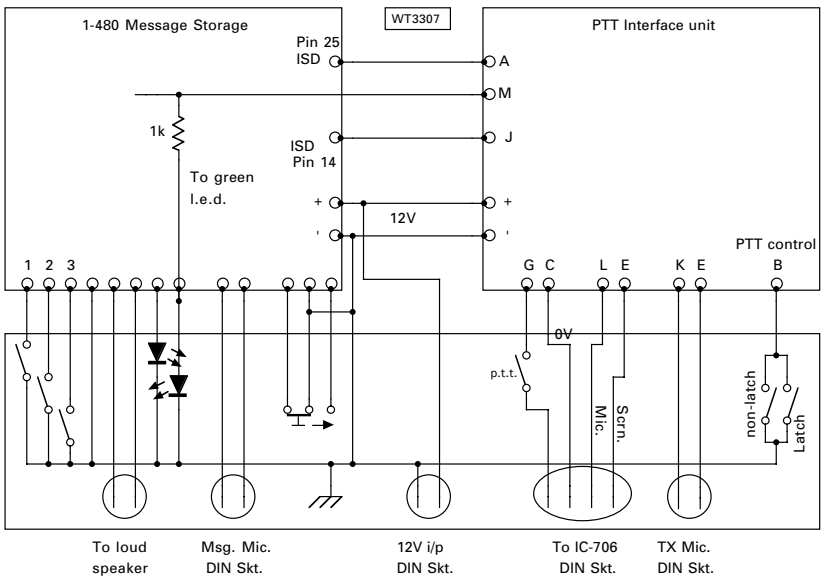


Fig. 2: The interconnections of interface and recording chip system.

Two Microphone Inputs

Eagle-eyed readers will now wonder why there are two microphone inputs? (One for the IC-706 and one for the message board).

It involves quite a lot of circuitry to achieve only one, as the ISD data sheets shows the input circuit as floating and balanced. (I could have used the analogue-out on pin 21 but this buzzed like mad when fed back into the '706).

My next thought was to build a separate microphone amplifier and feed this into the high level input on the storage board. And then arrange things to feed the '706 but it was all getting out of hand! Two separate sockets are therefore used and you have to change them over. I thought it better to sacrifice convenience for integrity of quality!

Interface PCB

Given that the circuit isn't too complex, it could be constructed on Verobard. However, I chose to make a p.c.b. for the interface **Fig. 5**.

The selected components are placed on the board surface and a very light sketch of the interconnections made onto the top side. Then holes were drilled for the components using a piece of Veroboard as an accurate spacing tool and jig.

Next, I took a digital photo of the board top showing the holes and rough interconnection lines. Using an image manipulation program (use your favourite one) make a mirror image of the layout and print it out.

Clean the board and degrease it, then using the mirror image printout, join up (on the copper side) all the interconnect lines to the pre-drilled holes with an etch-resist pen. Finally, etch the board as usual.

Using the top component view insert and solder all items. Through pins can be seen at the lettered terminals but were not used in the final wiring. They are very handy for testing and checking, however!

There are some items to install on the underside of the board.

a) On IC2 a 'jumper' between pin 13 and pin 3
b) Also on IC2 pin 9 and pin 4
c) and the two points marked 'X'
d) IN4148 diodes across the Relay coils

Solid Box

I used a nice solid metal box but you could use a (cheaper) plastic one. The internal message monitor speaker was a surplus unit from an old radio and came with the bracket on it. The photograph of the unit shows the p.t.t. key I used that may be difficult to obtain. Instead, you can use two buttons (like the message buttons) one latching and one non-latching.

I used a piece of ribbon cable to connect to the trackside of the

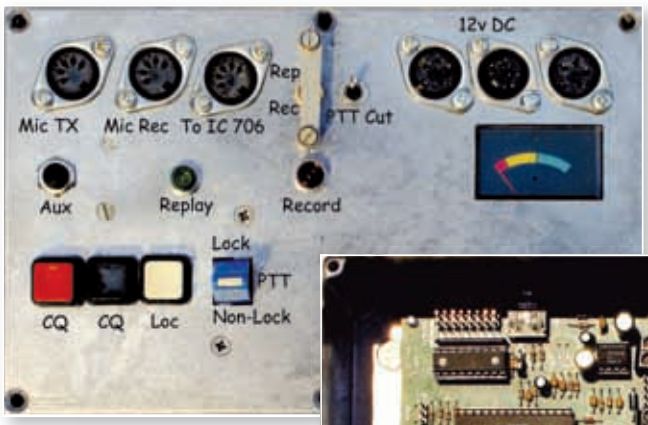
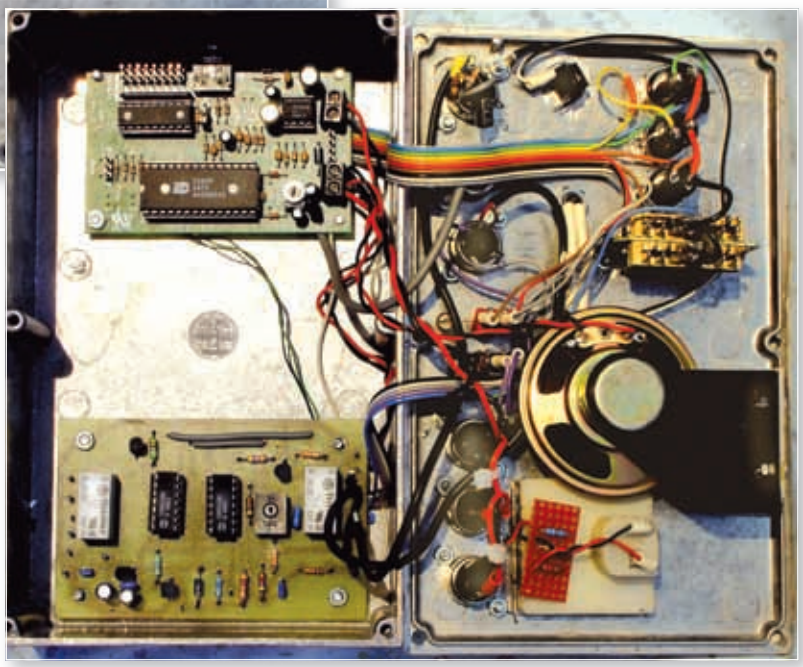


Fig. 3: The front panel of my CQ Box prototype.

Fig. 4: The CQ Box opened up.



b) Remove the two l.e.d.s. Attach black wire to green l.e.d trackpoint and white wire to the red l.e.d trackpoint.
c) Grey wire goes to the earth track behind the l.e.d.s. (This serves as a shared earth for the P/R switch and the l.e.d.s).
d) At the P/R change-over, brown wire is record and the red is replay. At this point it's a good idea to remove the supplied jumper from the other side of the board.
e) Blue wire is the earth side of the 'message cue' buttons and is bonded at the far end to the front panel lid.
f) Thin purple wire is the EOM from ISD pin 24 to 'A' and brown is the feed from the l.e.d series resistor to 'M'.
g) White wire at the top of frame is the audio feed from ISD pin 14 to 'J'.
h) Finally, I've used the screw terminals for the LS feed and as a splitter point for the 12V d.c. feeds.

Testing The Unit

When testing the unit, do not install the 4011 chips yet. Connect to 12V and see if the regulator is putting out 5V. If correct take a flying lead from the IN4001 and dab this voltage onto 'M'. Relay RL1 should close. Next, try the 4.7kΩ resistor feeding Tr2, RL2 should now close. Disconnect and install the 4011 chips.

Earthing 'B' should close RL2. If it doesn't, check with a digital voltmeter that pin 3 of IC1 and pin 10 of IC2 are high. Apply 5V to 'M' and RL2 should close, if not check pin 4 is showing high.

If all seems well wire-up all units using the block diagram as a guide.

Setting Up

Just a bit more testing to do! I have a second IC-706, which, providing the antenna is removed and the 20dB pad inserted, makes a fair monitor. Of course, headphones on the monitor receiver are essential.

First, check operation using f.m. to see if the output is 'clean' and check for buzzing or humming. Comparison with the original hand microphone is a good idea. Then try a message replay. Try adjusting the 4.7kΩ variable to see what the range is. (It may be that the 12kΩ resistor needs altering).

For operation with s.s.b., take the compressor function out and reduce the '706 microphone gain to mid-way. The ISD Chip has compression applied in the microphone pre-amplifier already and the trick is to apply enough for your 'contest' voice – but not too much to compress the message out of recognition. You want your CQ calls to be answered favourably!

I spent a lot of time juggling compressor levels, microphone gain and the 4.7kΩ variable to achieve a balance.

The loudspeaker can be turned well down in contests so that it's just in the background. It can get on your nerves listening to yourself!

Finally, you need a helpful local station with a good pair of ears to have a critical listen. When all is well some contest CQ calls can be recorded. Incidentally, I intend to make one long one, one shortish one and one good phonetic rendition of my locator square. ●

Parts list

1 x Eddystone Box. Suggest Maplin N93BQ £6.99
1 x Milford Instruments ready to go 1-480 £35.00
4 x Push Buttons Momentary. Suggest Maplin FF96
1 x Push Button Locking. Suggest Maplin YW41
2 x SP DT Min toggle Switches
1 x Small 50mm (or less) Loudspeaker
2 x BT 47 Relays DP c/o 12v Coil
2 x Led in Bezel Mounts 1 Red 1 Green
1 x 3.5mm socket for AUX. Control (IF required)
3 x DIN Sockets 5 pin 180 (or other connector of your choice)
1 x DIN Sockets 4 pin (or other d.c. connector of your choice)
1 x PCB Mount 4.6k pot
2 x 14 pin IC holders
15 x PCB pins for terminals
2 x 40111BE CMOS Chips
3 x BC548 or similar NPN.
1 x 5 volt Reg 78LO5 or similar
2 x IN4148 1 x IN4001

Resistors
1 x 330, 12k, 10k, 1k
5 x 4.7k

Capacitors
2 x 10n, 2x0μ1F, multilayer/ceramic plate or similar
1x1μF, 1x10μF
|Ribbon cable, miniature screened audio lead

Apart from where indicated most of these components were originally sourced from SYCOM, PO Box 148, Leatherhead, Surrey KT22 9YW.

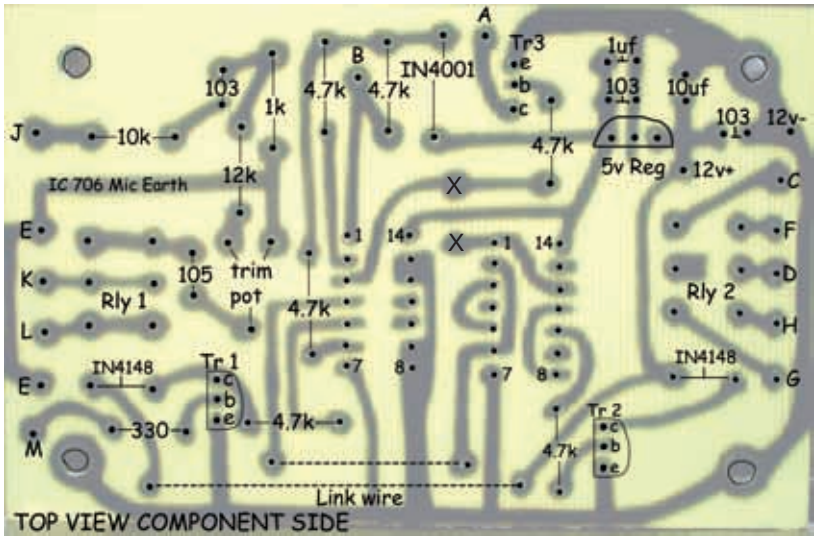


Fig. 5: The edited digital picture of my prototype p.c.b. using the method outlined in text.

References

www.milinst.com
www.windond-usa.com

Velleman Kit and interface *Radcom* Dec 1998

I recommend a look at the Milford and Winbond websites and read all available information. The data sheets on the Winbond site for the ISD2560 chip are on a PDF format and very helpful. Follow the supplied directions and record and replay some test messages just to get a feel for it.

Happy CQing and see you in the the next *PW* QRP contest!

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Antenna Workshop

Gerald Stancey G3MCK asks how efficient is your a.t.u. and is it worth improving on that figure?

Most Radio Amateurs rarely give their antenna tuning unit (a.t.u.) a second thought – provided that it works! By using the word 'works', I mean that it transforms the load from the antenna system into a 50Ω load for the rig, doesn't arc over and doesn't get too hot. However, more attention to this item may improve both signal strength and the station's DX capability.

Typical Efficiencies

I'm aware of a.t.u.s that give typical efficiency ratings similar to those shown in **Table 1**. But what do these efficiency ratings mean? A loss of 1dB is probably not worth bothering with, as this is the lowest change in volume that can be detected by ear under the best conditions. The ARRL's *Antenna Handbook* says that a change of one or two dBs in the antenna system's efficiency usually isn't worth worrying about.

A 3dB change in level is readily detectable as a change and is a useful increase in signal strength. An increase of 6dB may be what you can get by adding either an amplifier or a beam antenna to your dipole driven from your 100W station. You could get a change of 10dB, comparable to the improvement of adding both an amplifier and a beam to your set-up.

So, with the improvements I've mentioned, I hope that you'll now agree that it's worthwhile looking at the efficiency of your a.t.u. Making a decent a.t.u. is usually a lot cheaper than buying an amplifier!

Straightforward Efficiency

In principle a.t.u. efficiency is very straightforward. All you do is measure the power going into the a.t.u. (Pi) and the power going out (Po), then the ratio (Po/Pi) x 100 is the efficiency of the a.t.u. However, making the measurements may not be easy and there's always the question of errors and accuracy. (But for the moment we'll ignore these inaccuracies).

Table 1.

Eff.(%)	Loss(dB)
80	1
50	3
25	6
10	10

First, let's look at the easiest power to measure, and this is the power flowing into the a.t.u. – Pi. If the a.t.u. is correctly adjusted it will present a resistive load (usually 50Ω) to your rig. This means that if you measure either the current flowing into the a.t.u. or the voltage across the input of the a.t.u. you can calculate Pi. If you have a forward power measuring meter in-line from the rig to the a.t.u. you can obtain this figure directly.

Finding the output power, Po, is more tricky, as the load presented to the a.t.u. will almost certainly contain a reactive element. This means that you have to know the nature of the impedance as well as the current flowing through it, or the voltage developed across it. For example, let's assume that the load impedance is 50Ω. This consists of a resistive component of 40Ω in series with a reactive component of 30Ω.

If 1.5A flows through into the reactive load then the power dissipated in the load is 1.5x1.5x40 = 90W as power is only developed in the resistive part of the load. If the feeder to the above load is 50Ω coaxial cable, then the s.w.r. in the cable feeding that load will be 1.7:1. This figure is obtained by using a *Smith Chart*. An impedance bridge or antenna analyser could also be used to find the particular resistive and reactive values for the load impedance.

If you are applying 400W into the a.t.u., this will not provide a very good efficiency (22.5%, 6.5dB loss) and it would be advantageous to improve it. The best solution is to build a single band a.t.u. and spend some time optimising it.

The designs for the most efficient a.t.u.s were probably created in the 1930s. The illustration, **Fig. 1(a)** shows a typical design to match a rig into a low impedance load. The coils for these units were made using heavy gauge wire and use a big high quality capacitor. If you used one yourself you can, when matching into higher impedances, use the layout of **Fig. 1(b)**. You can experiment by changing the inductance of both coils and the degree of coupling until you have maximised the current in the load for the same power being fed into the a.t.u.

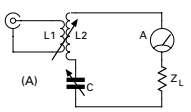

Fig. 1(a).

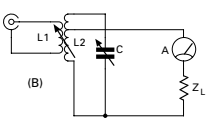

Fig. 1(b).

A good rule of thumb for L2 is to start with 0.25μH of inductance and for C, 1pF of capacity per metre of wave length So, on 7MHz you can start with 10μH and 40pF.

More Complex

Let's now look at a more complex situation namely, the case of an a.t.u. feeding a random bit of wire. The problem is to actually measure the load impedance. My answer is that you shouldn't bother!

I'll assume that your a.t.u. has a low efficiency, which you'll want to improve. If so, you are going to have to make a new a.t.u. Hence, all that's necessary is to compare the efficiencies of the old a.t.u. and new one.

Comparing the efficiencies is done simply by measuring the currents going into the bit of wire when using each a.t.u. Again, you'll have to experiment with the new a.t.u. to maximise the current into the bit of wire. (Remember, you must have the same input power for all the tests).

Note: You may not know the efficiency of either a.t.u. However, you will know that you'll have done your best and you can assess the improvement that you have made.

Accuracy & Errors

All measurements have errors and these can be misleading. For example, assume that you can measure Po and Pi with 10% accuracy. Should you understate Pi by 10% and overstate Po by 10%, then the a.t.u. whose true efficiency is 80%, would show as being 100% efficient.

Accurate r.f. measurements are not easy to make but the comparative current method, as described above, for use with end-fed wires is probably the best to use in every case. Using this method Pi doesn't come into the picture.

But are the improvements worth the effort? The answer to that question is up to you to decide but the figures in Table 1 show that there may be scope for you to make dramatic improvements. A friend, who is a keen DXer, has worked the lot using just 100W. He does though, have six mono-band a.t.u.s, where each one is optimised for the band in use.

Each mono-band a.t.u. is used with his doublet antenna and is relay selected when the band is changed on the rig. It really is a large piece of kit as small-size and efficiency don't always go hand-in-hand. But his achievements say it all!

Well there you have it! You can make up your own mind and optimise your antenna system as you want to. ●

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From Clandestine Radio to Early Television Recording

Valve & Vintage

The brown dust-coat clad figure indicates that it's Phil Cadman G4JCP on duty in the vintage shop this month. He's got much to chat about this month with topics ranging from Clandestine radio operations to early television recording!

A hearty welcome to the Valve and Vintage 'shop' – this month appropriately bedecked with bunting and flags – on the 75th anniversary of *Practical Wireless*. I'd like to congratulate the Editor, the Publishers and everyone associated with *PW* on a magnificent achievement.

Right, that's my hat 'tipped' in the direction of the Editorial chair, so now on with the column! Last time, I asked if anybody had any information about wartime clandestine radio operations. My request brought a response from **Charles Wilson M0CDD**, who very kindly sent me some extracts from a book written by **Pierre Lorain**. In his book, *Secret Warfare*, Monsieur Lorain provides answers to some of the questions I posed.

Briefly, continuous wave (c.w.), rather than amplitude modulation (a.m.) or modulated continuous wave (m.c.w.), was used by both the clandestine station and the home (normally the UK) station because when operating simple equipment under difficult conditions, Morse code was found to give the greatest accuracy. That's still true today, of course, a point which won't be lost on Radio Amateurs.

Consequently, regenerative detectors – as used in the **Paraset**, a clandestine transceiver that I specifically mentioned – did have to oscillate in order to make the transmission from the home station audible. This was a serious problem with receivers having no r.f. stage, as the weak signal produced by the detector and radiated by the antenna, could allow enemy authorities using sensitive direction finding equipment to locate the clandestine station.

Indeed, Lorain says, "the radiation from the Paraset could disturb broadcast receivers within a hundred yard radius. And for this reason, wherever possible, Parasets were removed from city networks and used in the field where receiver radiation would have less dangerous consequences." Very interesting indeed.

Thank you Charles and I shall certainly try to get a copy of Lorain's book myself.

Pre-war TV Transmissions

Also last time, I asked if anyone remembered receiving pre-war television sound transmissions from Alexandra Palace. These were broadcast from November 1936 until September 1st, 1939 on 41.5MHz, and were heard well outside the expected service area, even as far away as South Africa and the east coast of the USA. The high sunspot numbers prevailing at that time helping considerably, I'm sure!

Ron Andrews GW3NLN wrote to tell me that although he didn't hear any pre-war transmissions, he did hear the 41.5MHz transmissions when stationed in Berlin during the Airlift (1948 –1949). This was while Ron was doing his National Service with the Royal Signals. (Thank you for the 'signal report', Ron. Much appreciated).

I was also contacted by **John Tuke G3BST**. He says he never saw or heard pre-war 405-line TV either but between 1932 and 1935, he did see 30-line TV being demonstrated at an electrical shop belonging to **John Ferguson G6FS**. The transmissions were made on the medium waves, broadcast by the then National programme on 261.1m after normal programmes had finished. (Yes, the video bandwidth was so low a normal sound transmitter could be used!).

The picture John saw was three inches (75mm) square, and used the mirror-drum scanning system. (Thank you very much, John. Your memories of early TV were fascinating!).

Indeed, John's E-mails led me to find out a little more about those early TV transmissions and I discovered that there's another 75th anniversary we should be celebrating. On the August 22nd,1932, the BBC began its 30-line public television service, just one month before *PW* first appeared.

I also came across information about recordings of 30-line television. These were on phonograph records, as the bandwidth needed for 30-line pictures (at 12.5 frames/second) is well within the audio frequency spectrum.

Television Test Discs

Most recordings were test discs sold so the television viewer could check and align their TV set outside the very limited broadcasting schedule. (Reminds me of the old colour Trade Test transmissions which were broadcast outside normal programme hours on BBC2).

One particular disc – the **Major Radiovision** Test Disc – was sold by Selfridges and was advertised in *Television* magazine in 1934. Note, that periodical wasn't in any way related to the modern *Television* magazine, this one, which was originally entitled *Practical Television*. Actually, *PT* was yet another one of F.J. Camm's magazines, which originally

appeared as a four-page section within the December 9th, 1933 issue of *PW*!

The original *Television* magazine was first published in March 1928 and was described on its cover as: The Official Organ of the Television Society and declared itself to be the world's first television journal.

I also came across what's become known as the **Silvatone Recording**, which is the earliest known recording of broadcast television. Made in 1933 by a private individual in his own home, the disc contains a four-minute recording of *Looking In*, the first television revue. See **http://www.tvdawn.com/silvaton.HTM**

Editorial note: *This site is absolutely fascinating and I thoroughly recommend a visit!* ***G3XFD***.

It seems incredible that, but for a home recording on a ten-inch (25.4cm) aluminium disc, we would have almost no idea what those pioneering TV shows were like. Interestingly, the recording shows that even in those early days, television programmes were distinctly different in style to radio and film productions.

However, what's not apparent from the recording (and this was new to me) the mirror-drum camera used for the production projected a flying spot of intense light around the studio and banks of photocells picked up the reflected light. So the studio was in darkness except for a brilliant flashing light. It's amazing the performers managed to perform!

Recorded On Film

Before the advent of video tape recording, the only way to record high definition TV was to use film. Given the cost, the space/environmental requirements to store film, much live television was never recorded and has been lost forever.

Even when programmes were videotaped, the tape was very often wiped and used again. I'm sure everyone is aware that nowadays, radio and television companies encourage people to send in personal recordings of 'lost, believed wiped' programmes.

Digital data reduction techniques and the DVD (and its would-be successors) have made storing programmes more practicable, so it's now imperative that all existing recordings of previously 'lost' programmes be copied for future generations to enjoy. And, of course, to also generate income for the TV and radio companies through selling the recovered programmes on CD and DVD!

Audio Tape Recoding

My first technical interest was not radio but tape recording. Having been given a Fidelity Argyll Minor tape recorder when I was still quite young, I took to recording people and radio programmes and even TV sound.

As the cost of recording tape was prohibitive in those days, I wiped my one and only tape many times and so lost all my early recordings. Later on, when my budget stretched to acquiring more reels of tape, I did keep some recordings.

Consequently, I still have some 'time-shifted' sound (and TV sound) recordings from the late 1960s and early 1970s, including a few minutes of Radio Amateurs operating on-air. Many old tapes in my collection are in poor condition and I intend to transfer them all to CD in the coming months (years?). One tape, from 1970, has been played all the way through and a test dubbing made to MiniDisc (another recording format now apparently obsolete).

One Radio Amateur recorded on the tape is **Stan Hemmings G8SR**, a friend who sadly became a Silent Key some years ago. What's the point of all this you may ask? In answering, I'm drawing attention to the fact that we have photographic images of long gone people and places and we have old radio and electronic equipment (almost) in abundance but what about sounds?

Certainly there are recordings of broadcasts, as I've already mentioned but what of individuals? Modern camcorders are (inadvertently, almost) capturing sounds and the voices of people but how many archive recordings exist of ordinary people? Do you know what your grandparents or great grandparents sounded like? I'll bet you have pictures and maybe some family heirlooms. But have you their voices on tape?

I can date one recording on my tape to the day. It was made on the last day of 1970, and contains a complete edition of *DX Jukebox* (or was it *Juke Box*), a programme for DXers and short wave listeners broadcast by **Radio Nederland Wereldomroep** in Holland. Anyone else remember **Jim Vastenhoud** and **Harry van Gelder**? And PO Box 222, Hilversum, Holland?

Radio Netherlands weren't the only international broadcaster providing a special programme for DXers and broadcast radio enthusiasts. At the same time, Radio Sweden had *Sweden Calling DXers,* Radio Station HCJB from Ecuador broadcast *DX Party Line,* Radio Canada had the *Radio Canada Shortwave Club,* and even the BBC had its *World Radio Club.*

In fact, there were many DX programmes being regularly transmitted at the beginning of the 1970s. A contemporary *World Radio and TV Handbook* lists over 25 such programmes from different broadcasters. Sadly, no such DX programmes are listed today, none, which are actually broadcast over the radio anyway.

Phil Cadman G4CJP
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Right at the end of my tape, there's a ten-minute extract of a World Radio Club programme. One of the programme's presenters will be familiar to readers of 1970s *PW* I'm sure: **Halvor Moorshead**. Also mentioned as being a guest on a forthcoming special programme was **Pat Hawker G3VA**.

Oh and as well as the DX programmes themselves, most broadcasters sent out free printed fact sheets and guides specifically for DXers and short wave listeners. Yet out of all the DX programmes, *DX Jukebox* was my favourite, but all were interesting and very informative and they were so much more technical than anything broadcast today. I still miss them!

So, dig out those old reel-to-reel tapes or cassettes and have a listen. Do they have any radio programmes on them? The s.w.l. and DX-related programmes are of great interest.

Do you have recordings of Amateurs in QSO, particularly those who are now Silent Keys? Maybe you recorded a well-known Amateur giving a talk to your radio club. How nice (for example) it would be to actually hear **Louis Varney G5RV** talking about his G5RV antenna.

Historians have finally realised the value of early home movies, which show life much as it really was, untainted by any broadcaster's editing department. Sound recordings are important too and ought to be preserved before they're lost.

Surviving 75 Years

Finally, I must say, going back to the number of radio, TV and electronics magazines that have come and gone over the years, it really is remarkable that *PW* has survived for 75 years. Perhaps it's because the editorial policy hasn't changed much over the years even if the magazine's audience has?

Maybe there's just a little bit of old F.J. in *PW*'s current Editor? So once again, many congratulations and I wonder what the next 75 years will bring? **73 and good DX!**

Editorial note: Immediately after he'd prepared his column for this issue, Phil G4JCP entered hospital for a major heart operation, undergoing double bypass surgery. At the time of writing this tribute, Phil is recovering from the operation and I'm sure all our readers will join the *PW* team in wishing him good health in the future.

Rob G3XFD

VHF DXer

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David Butler G4ASR has reports of Sporadic-E openings on all v.h.f. bands and a tremendous 4600 kilometre contact on the 70MHz band.

Although the weather was very poor during June I am pleased to report that propagation during that month was very good on all the v.h.f. bands. Despite few tropospheric openings it was Sporadic-E (Sp-E) propagation that created much excitement on the 50, 70 and 144MHz bands. It's surprising just how much fun can be had from a layer of ionisation!

The 50MHz band was open every day throughout June and during this period there were at least 15 days of transatlantic propagation to North and South America. There were also four days when E-layer propagation existed over the pole to Japan. The 70MHz band was also in good shape, with Sp-E openings on most days throughout the month.

Ionisation was quite intense at times with 144MHz openings being reported on 13 days during the period. One of the best days for Sp-E propagation was on June 25th with the 50MHz band being open to Japan around 0900UTC followed by a huge opening to North and South America and the Caribbean area, which lasted for over 13 hours. During the evening, an exciting 70 to 50MHz cross-band contact was reported between England and Canada and earlier in the day there were three separate Sp-E openings on the 144MHz band to stations in Italy.

The 50MHz Band

Stations reported a terrific amount of DX activity on the 50MHz band every day during June. Much of the traffic was via single or double-hop modes with contacts being made all over Europe and the nearer reaches of Asia and Africa. Some of the more unusual European stations being contacted from the UK included 3A2MD (Monaco), 4U1ITU (ITU Geneva), C31BO (Andorra), HV0A (Vatican City) and LX2007L, a special callsign from Luxembourg to celebrate the European capital of culture 2007.

Other contacts included the African stations of 3V8SS (Tunisia), 7U5CI and 7X0RY (Algeria), CN8SG/M (Morocco), SU1SK (Egypt) and the Middle East stations of 4X1IF (Israel), A61Q (United Arab Emirates), A71EM (Qatar), EK6TA (Armenia), JY4NE (Jordan) and TA2ZAF (Turkey). At times the Sp-E path linked into a trans-equatorial propagation (t.e.p.) path enabling QSOs to be made deep into Africa with the stations of 5H3EE (Tanzania), 5T5SN (Mauritania) and C52T (The Gambia).

Openings to Japan (JA) were reported around 0930UTC on June 24th to the stations of JN1FNC and JA3FYC and at 0910UTC on June 25 to JA5AIE. On the following morning a two hour opening between 0700-0900UTC was reported by stations in Scotland and northern England. Signals were quite strong peaking up to RST 559 at times and included the stations of JE1BMJ, JA7WSZ, JH7MSB, JH7XRZ and JL8GFB. To end the four day spell of extraordinary over-the-pole propagation, the station of JR0EQQ was worked by operators in southeast England around 0845UTC on June 27th.

Some of the best 50MHz openings were over the transatlantic path to stations in North and South America. Propagation was reported on 16 days during the period with particularly good openings being reported on June 20th, 22nd, 25th, 26th and 27th. The opening on June 20th, commenced at 1435UTC when the station of G3ZSS (Surrey IO91) heard V26HS (Antigua FK97) peaking 5&3 on 50.115MHz. As with many openings of this type, the signals started off quite weakly and then gradually increased in strength.

Over the next three hours many operators in southern England reported DX stations on s.s.b. peaking up to 5&9 over paths in excess of 7000km. Operators in the UK reported making contacts with FJ5DX (St. Barthelemy, French West Indies FK87), HH4/W3CMP (Haiti FK39), HI3TEJ (Dominican Republic FK49), V44KAI (St. Kitts FK87) and the Puerto Rico stations of NP4A, WP4G and WP3UX (FK68).

Fig. 1:The 9-element Vargarda Yagis at the QTH of David Butler G4ASR.

A four hour transatlantic opening was reported on June 22nd between 1525-1925UTC. The opening was quite widespread in the UK with stations as far apart as MU0FAL (Guernsey IN89), GM8IEM (Scotland IO78), GD0TEP (Isle of Man IO74), MW0HMV (Wales IO71) and G3VYF (England JO01) all participating in the fun.

The DX being worked in the continents of North and South America included the stations of FY1FL (French Guiana GJ35), HH4/W3CMP, HI3TEJ, NP3CW, WP3UX, KP4EIT, NP4A, WP4G, PJ7TM (Netherlands Antilles FK88), PZ5RA (Surinam GJ25), UT1FG/MM (GJ63), VP2EDH (Anguilla FK88), V26HS and V44KAI. Towards the end of the opening some stations found a path open to Canada with the stations of VO1HE and VO1MP (Newfoundland) being contacted.

An excellent 50MHz opening was reported on June 25th, which lasted for over 13 hours. The station of K1TOL (USA FN44) was the first to be heard at 1020UTC and the last one of the day at 2345UTC, was KM1E (FN53). In between these times were dozens and dozens of American and Canadian stations and other DX goodies such as FJ5DX, KP4EIT, PJ7TM,VP2EDH, 8R1WD (Guyana), FM5AA (Martinique) and FP5CJ (St.Pierre & Miquelon). In another transatlantic opening that occurred between 1745-2145UTC on June 28th, the

stations of CO8DM (Cuba FL11) and TI8II (Costa Rica EJ79) were contacted as well as numerous stations in Canada and the USA.

The 70MHz Band

The Four Metre band was open for long distance Sp-E contacts on many days throughout June creating much excitement, even for those stations with low-power frequency modulation (f.m.) equipment. Of course, there still aren't many European countries with access to the 70MHz band but a few national societies are making good progress in this respect.

One such result was that the organisers of the Nordic VHF Meeting held this year in Norway. They obtained a temporary permit for 4m operation for the duration of the meeting that was held on June 8th to June10th, 2007.

Using the callsign **LC0VHF** on 70.150MHz, the group running 25W into a 9-element Yagi, made a number of QSOs with stations in G, GD, GI, GM and GW, Denmark (OZ), Ireland (EI) and Slovenia (S5). Unfortunately, there was no Sp-E propagation to Norway during the weekend, so all contacts were made using FSK441 or JT6M data modes via meteor scatter. The UK contacts included the stations of G0CHE, G0GMB, G1OAR, G4DEZ, G4FUF, G4IGO, G4YTL, G7CNF, GD0TEP, GM4AFF, GM4ISM, MM0DQP, MM5AJW, 2M0BAE, GW8ASD, GW8IZR and MW0HMV.

Last month, I mentioned that Portuguese stations permission to use the band had come to an end. However, at the beginning of June came the good news that CT-stations had been granted access for another three month period ending on August 31st.

The stations of CT1FFU, CT1HZE and CT1JAD seemed to be the only Portuguese operators active, making many f.m. and s.s.b. contacts around the UK during Sp-E openings in June. Other DX contacts made during this period included the stations of OZ2LD, OZ3ZW, OZ7IS (Denmark), SV1DH, SV2DCD, SV9GPV (Greece), S51DI, S54M, S59MA (Slovenia), ZB3B (Gibraltar), 9A1Z, 9A3SO and 9A6R (Croatia).

During a Sp-E opening on June 22nd there was a flurry of excitement when **OY1CT** (Faroe Islands IP62) appeared on the band. He was a new country for many operators and managed to make a number of c.w. contacts with stations in southern England and Wales.

During the evening of June 25th a remarkable cross band contact was achieved between the 70 and 50MHz bands. **Nigel Coleman G7CNF** (Somerset IO80) reports that at 2135UTC he made a c.w. contact with the station of **Mike Smith VE9AA** (Canada FN66) over a 4612km path. Nigel operated on 70.102MHz using a Yaesu FT-2000 transceiver driving a home-made transverter and 160W amplifier into a 7-element YU7EF Yagi.

At the QTH of VE9AA a Trio TR-751A transceiver was used in conjunction with a Spectrum transverter and a modified Cushcraft A50-6S Yagi. The 70MHz signal from G7CNF was received in Canada with a 449 report, whereas the 50MHz signal from VE9AA running 100W into a pair of 8-element Yagis was received with an RST 599 report. Nigel mentions that he had no indicators to show that the 70MHz band was open to Canada, other than that the 50MHz band was full of 5&9 signals from Canada and the USA at the same time.

The QSO, however, was not the first time that a transatlantic cross-band contact has been made. The first authenticated QSO was achieved 27 years ago, at 1627UTC on November 17th, 1980 when the 70MHz station of **Gordon Pheasant G4BPY** contacted the 50MHz station of **Andy McLellan VE1ASJ** over a distance of 4591km. A year later, on November 4th, 1981 the trans-Atlantic path was broken again with the Canadian station of VE1ASJ making cross-band contacts from the 28MHz band with the 70MHz stations of G4JCC at 1356UTC and GW4HXO, for the first GW, at 1422UTC.

Further cross-band contacts were then made on December 8th, 1981 with VE1ASJ, this time on the 50MHz band, completing QSOs with EI6AS, EI6DT, G2AOK, G3APY and GW3MHW. However, all these contacts were made via F2-propagation at the peak of the Sunspot cycle. What makes the contact between G7CNF and VE9AA particularly interesting, is that it was accomplished via multi-hop Sporadic-E at Sunspot minimum. Congratulations to both stations!

The 144MHz Band

The first 144MHz Sp-E opening of this summer season was reported on May 13th to the Balearic Islands (EA6) followed by further Mediterranean opening on May 27th to France (F), EA6 and on May 28 to EA6, F, Italy (I), Malta (9H) and Spain.

There were 13 days of Sp-E openings during June with 144MHz contacts being made from the UK to stations located in Austria (OE), Bulgaria (LZ), Canary Islands (EA8), Ceuta & Melilla (EA9), Corsica (TK), Croatia (9A), Greece (SV), Hungary (HA), Italy (I), Macedonia (Z3), Malta (9H), Moldova (ER), Morocco (CN), Portugal (CT), Romania (YO), Sardinia (IS0), Sicily (IT9), Slovakia (OM), Slovenia (S5), Spain (EA), Ukraine (UT) and Yugoslavia (YU).

At my QTH (Herefordshire IO81), in a Sp-E opening on June 19th I made s.s.b. contacts with the 144MHz stations of IK0BZY, IK0SMG, IK0RWX, IW9HII (Sicily) at 1980km, TK5JJ (Corsica), YU1IO (Yugoslavia) at 1920km and 9H1TX (Malta) at 2265km. I was using a new antenna system consisting of an array of 4 x 9-element Vargarda Yagis, as shown in **Fig.1**. By the way, the new UK importer for these antennas is Charlie Christie GM1TGY (**clchristie@tiscali.co.uk**). On the following day, June 20th, I made further 144MHz contacts with the Portuguese stations of CT1BYM, CT1EPC, CT1HZE (on 145.525MHz f.m.), CT2JJB and EB7AEY (Spain).

Deadlines

That's it for this month. Although it's now essentially the end of the Sporadic-E season you should still find the occasional opening on the 50 and 70MHz bands. 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

75 Years Celebration - The 1930s

Every month during 2007 I'm celebrating the 75 years of *Practical Wireless* by looking at recollections or notable achievements and this time around I'm looking at events around 1932 - the year that *PW* was born!

At the beginning of the 1930s there were a number of stations active on 56-60MHz, the Five Metre band. There were three main types of receivers; super-regenerative, straight and superheterodyne. Although the superhet was more sensitive and selective, it was often difficult to receive signals other than those transmitted from a stabilised oscillator.

Most transmitters used self-excited oscillators or resonant line oscillators, both types being unstable due to vibration and heating effects. Even the swaying of the antenna in the wind would cause the frequency to vary. In order to get transmitters and receivers on the same frequency crude wavemeters were constructed, calibrated by means of Lecher lines about 10m (35ft) long. The simple wavemeters would then be passed around local stations so that they all could get on similar frequencies. It was rumoured that a number of 5m bands existed depending on which wavemeter you used!

In the 1930s, the term 'ultra-high frequencies' was generally accepted as relating to frequencies lying between 30 to 300MHz. Wavelengths below 1m were referred to as micro-waves or centimetre waves. In 1931, Guglielmo Marconi carried out microwave experiments using wavelengths of around 50cm, equivalent to 600MHz. This resulted in the opening during 1932 of the world's first microwave radiotelephone link between the Vatican City and the summer home of Pope Pius XI, a distance of about 25km.

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

HF Highlights

Carl Mason GW0VSW rounds up the latest news from the h.f. bands with the help of your reports.

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Never give up on a QSL card was **Colin Evans GW0IRP's** advice in reader's reports last month and it seems that he is not the only one! American Amateur **Gabriel Fuentes KP4BJD** was pleasantly surprised when he received a QSL card from **WA6DDR/KM6** (Midway Island) for a contact he made using s.s.b. on 14MHz on the May 29th,1963.

Gabriel say's "The operator Ronald Mcentire retired from the US Navy soon after the QSO and his callsign is now **K4RBM**. Mac visited the Dayton Hamvention for the first time this year and enjoyed himself so much it seems to have sparked his interest in Amateur Radio all over again. Enough, that is, to catch up with some old QSL cards he had not answered and 44 years after our QSO a card finally arrived. This proves that there is hope for those who have enough patience and wait!" Now, I am sure that many of you out there will have been in a similar position and have waited a long time for confirmation of a contact. If you have a similar interesting story or can beat 44 years then please let me know and I will include the best in a future issue.

Operation Delayed

Not all DXpeditions go to plan, as with the recent one in June to Agalega Island (3B6). Team leader **Witek Onaczyszyn SP9MRO** and his team had some problems with their catamaran, *Josephina,* on their way and had to head to St. Brandon Island (3B7) instead. Their catamaran had lost one of its two engines together with a sail, which was torn due to high winds and very heavy seas. All are now safe and the catamaran was towed by a fishing vessel called *Covadis* to the Island of Raphael, which makes up the St. Brandon Islands group.

Raphael Island looks rather like a football pitch and is home to a large colony of birds as well as two buildings. One building is occupied by the Coastguard and the other by the meteorological services. The team had only one generator and two wideband G5RVs but managed to obtain permission to operate as **3B7SP** while their catamaran was repaired. I hope that some of you managed to work them. If you did then the QSL route is via SP9SX and more details and further updates can be found at **http://3b6.godx.eu/**

Mount Athos Pirate

I have mentioned **Monk Apollo SV2ASP/2** in this column several times over the past few years. Active recently using s.s.b, c.w. and some RTTY he has made over 1500 QSOs but it appears someone else, with nothing better to do, has been operating c.w. using his callsign while Monk Apollo was actually transmitting using voice! He is now receiving cards for c.w. contacts made between 2300 on May 16th and 0200UTC on May 17th.

If you worked SV2ASP/2 on the key during this period I am sorry to say you worked a pirate. Monk Apollo is very busy at the moment helping to build three big cisterns for the monastery on Mount Athos and he does not foresee any further activity for a while.

Island Renamed

The Japanese Geographical Survey Institute announced on June 18th that the name of the Pacific island of Iwo Jima (the name means Sulpur Island) AS-030, which was the site of the famous Second World War battle, has been reverted to its original pre-war name of Iwo To. An official map with the new name will be released on September 1st.

Iwo To is one of the Volcano Islands 1800km (1118 miles) south of Tokyo, which form part of the Ogasawara Islands Group JD1. It last erupted in 1982, though none of the recent activity has been explosive. (Just small reactions to the mixture of magma and the surrounding water.)

Franz Josef Land QSLs

Some of you may be waiting for a QSL card from **Eugene R1FJT**. Well, his logbook will be heading back to mainland Russia with a member of the ornithological expedition on Franz Josef Land EU-019 until August 15th. The QSL manager **Victor Gorokhov UA4RC** will then begin processing the card requests and mailing out the QSLs as soon as he receives the log.

You may also be interested to hear that Eugene monitors and operates a beacon on 24.898 and 28.012kHz every day from 1830UTC at intervals of 15 minutes, so keep a good ear open if you are around at this time.

DX News

This month's DX News begins in East Africa and Burundi where **Siegfried Presch DL7DF** will be leading a team operating as **9U0A** between late evening local time on September 26th and noon on October 9th. All h.f. bands will be used with c.w. and s.s.b. - there will be one station devoted to RTTY, PSK31 and SSTV. There will be a special emphasis on the lower bands and digital modes and the pilot station for this DXpedition will be operated by **Bernd Koch DF3CB**.

The QSL route will be via DL7DF and the bureau or direct to Sigi Presch, **Wilhelmsmuehlenweg 123, D-12621 Berlin, Germany**. More information and an online log will be available at **www.dl7df.com/9u/index.html**

If you need Bahrain in your logbook, listen out for **Juma Al-Kuwari A92GT** who has been active on 21MHz s.s.b. around 1800UTC. All QSLs via **EA7FTR**. Closer to home now and Portuguese operator **Marques Manuel CT1BWW** will be active using the call **CQ4IPY** from September 8th until the 14th, during the 4th International Polar Year. Activity and will be on all bands from 3.5 to 28MHz using c.w., s.s.b., RTTY, PSK31 and SSTV with all QSLs going to his home call.

Also listen out for the Croatian special event station **9A07P**, which will be active until December 31st to celebrate the city of Djurdjevac. Operating can be expected on all bands using all modes and a special QSL card will be printed with the story of Djurdjevac on it. All QSLs will automatically be sent via the bureau.

In the Balearic Islands **Jorge Gorrin EA8TL** will be operating portable /**EA6** from his mobile home until August 24th as he visits Ibiza and Formentera Islands. He will be using an Icom 706 MkIIG and 100W using Eco Veicolare mono band antennas for the 3.5, 7, 14, 18, 21, 24 and 28MHz bands s.s.b. only and you can QSL via his home call.

Finally, in Poland **Marek Tomczyk SP3VT** and **Rysiek SP-0106-W** will be active as **SN1LH** from Czolpino Lighthouse (ARLHS POL-002) on the August 18th and 19th.

They'll be on most h.f. bands depending on conditions QSL via SP3VT.

Ex-pat Down Under

In New Zealand **Vince Lear ZL1VL** (ex G3TKN) thought it time he made another contribution to HF Highlights from his part of the world. Vince says "I have found a significant down turn in propagation to Europe compared to this time last year, though I am hoping that things will improve as we go towards the equinox period. Long Path openings on 7MHz from G to ZL seem to nearly always favour stations on the South Islands and I can often hear them working into the UK with signals that to me up here in Dannemora, Auckland that are virtually unreadable."

"If you look at the Great Circle bearings to New Zealand there is a large difference between UK to Auckland and say to Christchurch on the South Island. The long path and short path signals to Auckland take a more polar route and I believe we suffer more auroral absorption here. This was evident on a 10MHz QSO to G last month that had very pronounced auroral flutter on the signal. Since arriving in Auckland I have noticed much better propagation to mid and Eastern Europe and also witnessed some interesting antipodal focusing effects where the odd EA in Southern Spain will appear for a short time at quite good strength while no other European signals are audible. My operation here is virtually 100% c.w. running an Icom 756ProII and Alpha 99 amplifier. However, due to living in suburbia, I have never yet run more than 100W! The antenna is a 40m corner fed Delta Loop with its apex at 11m (38ft) I look forward to working *PW* readers when propagation allows."

Your Reports

On to your reports now and the log of **Chris Colclough G1VDP,** Nuneaton who managed to fit in a short holiday to Cornwall despite some atrocious weather. This forced him to cancel a proposed Lighthouse operation though he did manage to do some fishing! On his return home, Chris tried the lower h.f.bands but conditions were not good and only one s.s.b. contact was made on 3.5MHz with CQ0ODX (Portugal) at 2134UTC using a Yaesu FT-1000 Mark V Field with UK Ranger Linear Amplifier at 400W to an inverted trap dipole by Moonraker.

Martin Addison 2E0MCA in East Finchley, North London said "You know how bad the band is when IT9RYA is only being received at '55' and everyone seems to be complaining of the static noise and depth of QSB." His 7MHz contacts included HG200B (Hungary) 0718, DF2GN/P (Germany) 0744, IR2IPY (Italy) 1836, TM0A (France) on Aix Island EU-032 at 1913 and LG5LG (Norway) at 200UTC using a Yaesu FT-840 with a Heil Pro-set Plus microphone and a folded half size G5RV.

How long have you waited for a QSL card to arrive?

Peter Leng G0SVO worked J28JAon 14MHz.

The 10 & 14MHz Bands

In Worcester Park, Surrey, **Eric Masters G0KRT** used a Kenwood TS-570DG with SGC-230 tuner and 5W QRP to a W3EDP antenna logging 10MHz stations OM5OA (Slovak Republic) at 2001 while a little earlier and using 100W Eric worked CT3FT (Madeira Island) AF-014 at 0655UTC. Both contacts were made on the key!

Chris G1VDP found conditions on the 14MHz band "slightly better" with 9A4KW (Croatia) 1403, HB0/DL1ARS (Lichtenstein) 1530, SV9CVY (Crete) EU-015 at 1815, LZ1YG (Bulgaria) 1857 and SY8AN (Greece) on Antiparos Island EU-067 at 1949UTC all making his s.s.b. log.

In Biggleswade, Bedfordshire **Owen Williams G0PHY** managed voice stations VP8LP (Falkland Islands) SA-022 at 1915 and slightly later YV5SSB (Venezuela) at 2202UTC using a Yaesu FT-747 and 100W to an inverted L antenna. Eric G0KRT managed RX3DOR (European Russia) for a two-way QRP QSO at 1945UTC.

Also on the band was **Peter Leng G0SVO** in Gosberton, Lincolnshire who used a Yaesu FT-1000MP MarkV at 100 - 400W to a G5RV working s.s.b. calls EN80AL (Ukraine) 1028 QSL via UT8AL, 3XM6JR (Guinea) 1136 QSL via UA6JR, A61TX (United Arab Emirates) 1907 QSL via W4JS, HB0/DL1GDS (Lichtenstein) 1910 and JW/OZ0R (Svalbard) EU-026 at 2104UTC.

In Trelewis, Mid Glamorgam **Leighton Smart GW0LBI** spent some time operating QRP once again running just 5W c.w. from a Ten Tec Century 22 into a 55m (180ft) sloping long wire antenna. Contacts included 3Z50KRC (Poland) 1900, RA6YF (European Russia) 2100 and K2MGR (USA) Kurt in Bainbridge, New York at 0058UTC

Preferring the digital modes, reporter **Lee Carberry M0HOK** in Stockton-on-Tees has been using low power PSK31 this month. No times were given but running just 2.5W he worked IK0TYZ (Italy) and DL1OLS (Germany) before dropping his output to 1.5W to log DL/PE1NAR using his Yaesu FT-817ND with a simple dipole cut for the band and only 3m (10ft) in height.

The 18 & 21MHz Bands

On 18MHz, Peter G0SVO used 400W to find JK1UVP (Japan) at 1525 followed later by LU1ECZ (Argentina) at 1917UTC. Chris G1VDP managed one QSO with 9X0VB (Rwanda) before moving to 21MHz and a slightly better band to work CT1EUB (Portugal) 0810, SY8AN (Greece) again at 1132 and EA6AZ (Balearic Islands) Menorca EU-004 at 1134UTC.

The 28MHz Band

It is always good to see the higher bands opening and this month a few of you were able to operate on 28MHz. Leighton GW0LBI fired up his Yaesu FT-100 and with a mono band vertical found EC5RN (Spain) at 1600 and DL8KAC (Germany) at 1836UTC while Martin worked Nigel G6SFP on short skip in Chalfont St. Peter at 1254UTC.

Eric G0KRT used 5W c.w. again and lists UX5XB (Ukraine) 1606, HA8FK (Hungary) 1752, P33W (Cyprus) AS-004 at 1803, S51F (Slovenia) 1807 and EA1FAQ (Spain) at 1810UTC while his 50W F.M. log included F1GHX (France) 0947, DL4DOR (Germany) 1812, SM6X (Sweden) 1902 and OZ4NA (Denmark) at 1931UTC.

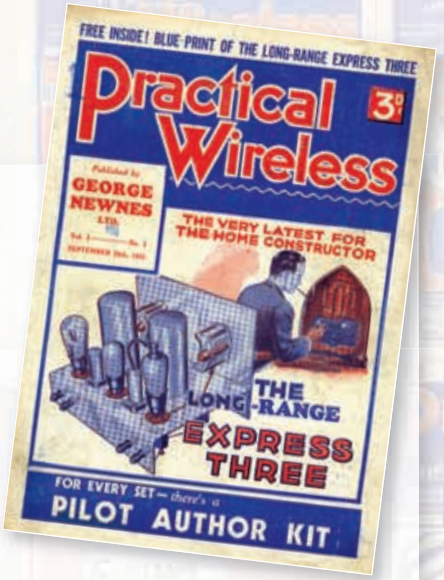
Also active was Peter G0SVO who lists s.s.b. calls YO2KHG (Romania) 1512, OH1JO (Finland) 2110, YZ1AU (Venezuela) 2113, TA3J (Turkey) 2119, SP9LJD (Poland) 1921 and OZ3BEN (Denmark) at 1932UTC whilst the voice logbook of Chris G1VDP showed TA3D (Turkey) 1457, A45WD (Oman) 1608, C31JM (Andorra) 1620, HZ1IK (Saudi Arabia) 1626 and T77M (San Marino) at 1629UTC.

Signing Off

Well that's about it for another month and many thanks to all our reporters for their logs. Hopefully, I have not missed out any of your reports this time around! Unfortunately, due to a recent house move, I have had problems with internet access and a broken foot has made it difficult getting to the local Internet café.

As usual, my thanks also go **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**

Introduction



September 24th, 1932 – the very first issue of *Practical Wireless* magazine.

On behalf of everyone – past and present – involved in the publishing of *Practical Wireless*, I, as the present Editor spotlight the very first issue of the magazine we now love and enjoy so much. Even though most of us regard *PW* as a rare survivor, I wonder how many of you know that when *PW* first appeared the publishing boom in wireless hobby magazines had almost subsided to a whisper? However, despite its late arrival, the magazine survived and thrived, so let's now take a look at some of the reasons why perhaps *PW* is celebrating 75 years!

After a truly fascinating journey through the history and heritage of *PW* we've finally arrived at No. 1, published on September 24th, 1932. And even though the magazine has managed a remarkable 75 years, I wonder if any of the staff in 1932 fully realised what a phenomenon the Practical series of titles was to become?

For many of us who have, literally, grown up with the magazine the founding Editor **Fred Camm** was unique. His original work can be seen in many publications produced by George Newnes from as far back as the early 1920s. Mr Camm's superb illustrative style approach (he was originally trained as a model and engineering draughtsman) could be seen at work in many of the hobby wireless magazines in the really busy and booming decade between 1920-1930.

It's my belief that F J Camm can never be bettered in his prolific output and pioneering work for hobby-based technical journalism. Those of us who have followed in his footsteps can never imitate the man himself but we can carry on the tradition.

To help us understand why *PW* was so successful I'll now look at some notable articles and projects that were published in the first issue and republished this month. Some of the written English may look quaint and ponderous nowadays but the ethos we aim to promote today is just as evident in the text that was published in 1932.

Round The World Of Wireless

The first edition of Round The World Of Wireless was to set a trend that ran for many years. The mixture of brief stories, some factual, with others that were somewhat unusual always included the occasional either odd or really quirky item thrown in for good measure and amusement!

One item covering the incredibly rapid growth of Russia's internal broadcasting network is of special interest. This growth eventually culminated in the huge system that enabled literally anyone around the world, equipped with a short wave receiver, to hear the news from Moscow. I have memories of the very powerful Radio Moscow transmissions being received over a telephone line in Scotland!

Another item, mentioning the problems within Spain, was in effect foreshadowing the civil war that seemingly became a prelude for the Second World War and the mushrooming use of broadcasting for propaganda purposes. I think it's ironic that these stories – probably chosen just because they caught the eye of the new Editor – turned out to be prophetic. The many hundreds of Round The World Of Wireless editions that followed over the years often covered remarkable events. However, just how prophetic they were can sometimes only be seen from our viewpoint in history.

Long Range Express Three

One of the problems associated with some of wireless hobby magazines published during the 1920s was the lack of tried and tested designs. The publication of the Long Range Express Three in the first edition of *PW* aimed to overcome this problem.

The editorial approach was aimed at having at least one, possibly two and occasionally three tried, tested and approved projects in each issue. Whether or not Fred Camm himself actually did design some of the projects published under his name cannot be verified nowadays.

However, what can be taken for granted is that F. J. tried his utmost to ensure that the major projects stood a very good chance of working, despite the fact that the majority of constructors reading *PW* would have been very inexperienced.

Kit Reviews & Projects

Personally, I think that modern day readers will find the Lissen kit review we've chosen for republishing to be rather amusing. Bearing in mind how new the *PW* title was, it's not difficult in 2007 to realise how nervous and uncertain the editorial staff were when preparing the text for their new venture. The rather ponderous wording, aiming-to-please and trying to assure their readers of good intentions, stands out clearly in the Lissen kit review as they tried their best for the reader and manufacturer.

However, it must be clearly obvious to anyone reading, from our viewpoint, that the Long Range Express Three project was dear to the hearts of the Editorial staff. In fact, I urge readers to read the introduction words for the project. Every earnest word was direct from the heart and the tradition continues in *PW* where the 2007 Editorial team is dedicated to you and the magazine.

Rob Mannion G3XFD

Practically Yours

75 years of Heritage & History

September 24th, 1932

First Issue of *Practical Wireless*

Round the World of Wireless
Interesting and topical paragraphs.

The Lissen SkyScraper
A new radio (from 1932) from Lissen is reviewed.

The Long Range Express Three
Percy Ray describes a fine and ultra-modern variable Mu screened-grid detector and pentode set.

Looking Back
September 24th, 1932
Snippets from the first issue of *Practical Wireless*.

Is Your Set Off Colour?
Some reasons why your television reception may gradually fall below standard and how to restore its lost 'tune'.

Using a Pentode
'Pentamp' says when using a pentode valve, a tone control is a valuable refinement.

PW 75th Anniversary Commemorative CD

If you've enjoyed this nostalgic trip back to the very first issue of *PW*, make sure you don't miss out on the opportunity to get a piece of *Practical Wireless'* history – **for free** – all you pay is the a postage and packing handling charge.

This month, we are giving you the opportunity to get hold of a very special CD containing the **first five issues** of *Practical Wireless* in PDF format plus a selection of other 'famous' electronic reprints from our history, including: *More Out of Thin Air, Practical Power Supplies and PW Interactive* – A selection of useful articles and information.

To get your **free** CD you will need to fill in the special coupon on page 9 of this issue and send it in with a £2 coin to cover P&P and handling. (Full details on page 9).

Don't miss out – this CD WILL become a collectors' item!

- **September Issue:** ***PW* Launch in 1932**
- **October Issue:** Pre-*PW* Radio Days
- **November Issue:** Pre-*PW* Radio Days
- **December Issue:** Pre-*PW* Radio Days

Every month during this eventful year we have been taking a look back at a decade of radio reading in this special 16-page supplement but this month we celebrate the very first issue of *PW*.

Round the World of Wireless

A New Idea in Radiogram Cabinets
A cleverly designed Radiogram cabinet is shown above, in the open and closed positions. The cabinet is of the ordinary small table type and the top portion houses a turntable and pick-up. This lets down after the manner of a flap, permitting the gramophone to be used. The receiver is mains operated and fitted with a Magnavox moving coil loudspeaker.

Forty-four More Russian Stations!
According to reports from Moscow the Soviet Union intends to build during 1933 44 more broadcasting stations, totalling an output of 380kW. Russia already operates 57 wireless transmitters. The new super-power stations at Sverdlovsk, Minsk and Kiev, which have been planned on similar lines to that of Moscow (Trades' Unions) will be ready to take over the radiation of daily programmes by the end of this year.

What a Medley!
Although no definite date has been fixed, listeners to the Danish programmes via Kalundborg may hope to hear during the autumn and winter months, a series of concerts in which Eskimo musicians and singers will take part. The relay will be carried out from the Julianahaab wireless telegraphy station in Greenland.

Ladies Only!
Contrary to the principle adopted by other Continental countries, with the exception of one male official at Milan, the Italian broadcasting studios only employ women announcers. With the opening of Bari, they now number a round dozen.

Lucky German Scholars!
In Germany the normal listening tax of 2 marks (roughly 2s. 6d.) has been reduced to 9d. per month in the case of schools utilising their receivers solely for the reception of educational broadcasts.

Where the Mormons Are!
With the completion of its 50kW transmitter, KSL., Salt Lake City, (Utah), USA, will be one of the highest powered station in North America. It will start operations by the end of September, when it joins the Columbia Broadcasting system by linking up with WABC, New York. The wavelength is 265.5m. (1,130kc/s).

Other USA stations to work shortly on increased power are: WHAS, Louisville (Kentucky), 366m; WCCO, Minneapolis, 370.4m and WCAU, Philadelphia, on 256m.

High-Power Transmitter for Alexandria
The Egyptian Government has placed a contract with an Italian concern for the supply of an high-power transmitter to be built at Alexandria and to be similar in type to the one recently erected at Coltano. It is to be used for both telegraphy and telephony and may eventually take over a radio programme service.

Egypt possesses four small privately owned broadcasting stations, namely: Radio Helioplis (270m.); Radio Szabo (504m); Amir Farouk (321m); and Port Said (285m), the latter being operated by an Anglo-French association, the Radio Club of the Isthmus of Suez.

Do You Listen to Buenos Aires?
Under favourable conditions broadcast programmes from three of the principal studios in Buenos Aires (Argentine Republic) can now be picked up between 1.30 and 3.0 a.m. British listeners report reception of LR4, Radio Splendid (303m); LR3, Radio Naçional (316m); and LR2, Radio Prieto (330m) .

Transmissions from Buenos Aires are also relayed at regular intervals to the United States and re-transmitted through WABC, New York and the Columbia network.

Spain's Status Quo
Although on four different occasions schemes have been put forward for a complete reorganisation of Spanish broadcasting system, it is hardly likely that any of the proposals put forward will mature in the immediate future. Dissension amongst the radio authorities in Spain has arisen owing to the fact that the plan suggested called for centralisation and full control of the network by Madrid.

Barcelona and the province of Catalonia insist upon complete independence and freedom of action. As at present conceived, Madrid would eventually possess a 120kW station, allotting to Barcelona and other provincial cities transmitters of lower power.

SOLVE THIS!

No. 1.
A Weekly Wireless Problem

Three books will be awarded each week for the first three correct solution opened. Mark envelopes Problem No. 1, and send to The Editor, Practical Wireless, Geo. Newnes, Ltd., 8-11 Southampton Street, Strand, London, WC2. To reach us not later than September 26th.

Brown owns a wireless set, and being troubled by chronic motor-boating decided to introduce a decoupling device. He accordingly fitted a Spaghetti resistance and condenser – the actual values he chose being 100,000 Ohms (Ω) and 2mfds (μF). The detector valve was the one he chose for decoupling, and this was coupled to the next valve by an R.C.C. unit. When the alteration was complete signals were very much reduced – in fact, almost inaudible. Wiring was okay. – what do you think was the reason?

Poor Pentodes!
There is a growing tendency to use pentode valves for doing any sort of job except the one for which they were designed! There is, however, considerable scope in the new season's battery pentodes for using them as combined detector output.

Don't Try This!
In some ways I admire the man who admitted to a valve manufacturer that he had tried unsuccessfully to mend one of their valves. He mentioned that he had little difficulty in soldering the filament but he broke the grid.

When asked (with a suppressed smile) how he intended to replace the bulb, he said that he would not have worried about that, as he would have protected the electrodes with a wooden box!

The Berlin Show
I was not very impressed by the Berlin Radio Show, except by its size; one hall alone had over 500 stands in it. There was one item of particular interest, however, which took the form of a kind of valve with innumerable grids; the idea is that the two anodes are connected across the output of an eliminator when the grids proved the various voltage tappings. The great advantage of this is that the voltages of the tappings do not vary with the current drawn as is the case with the conventional arrangement.

A Show Note
At the Show I noticed no less than ten kits, 211 different three-valve mains sets, only two four-valve battery sets and, incidentally, only one five-valve straight portable.

A New Spanish Custom
I often hear people grousing about their electric light mains for one reason or another, but they do not know when they are well off. I am designing a gadget for a harassed friend who is in Spain and has an AC supply, but when it fails (which is often) the company switches over to DC and bang goes the mains transformer in the unfortunate radio set.

The Variable-Mu
The variable-mu valve has come to stay and listeners who are troubled with swamping from a powerful local should fit one if it is humanly possible. – JACE.

The Lissen Skyscraper

The well-know firm of Lissen, Ltd., have been making wireless components practically since the inception of broadcasting in this country and their progressive policy has contributed in no small measure to the efficiency and reliability of the home-constructed set.

It was, therefore, with pleasant anticipation that I erected the kit of components (complete down to the last screw) by means of the really well-done wiring diagram supplied with it. I should like to give a word of praise concerning the manner of presentation of this wiring diagram. Attractively produced in colour, a great amount of effort must have been put into it and a mere glance as it suffices to indicate that the firm at the outset intended to produce a thorough job.

The attractive lines of the new Lissen Skyscraper Three Consolette may be gauged from this photograph.

A Simple Set to Erect

It is but the work of an evening to erect the set and it worked straight away without tedious tuning-up. I gave a kit of parts to a raw Amateur to erect and in point of fact he had never made a set before. He had no difficulty whatever and did not worry me as to where this or that went.

Upon connecting the set on to my aerial I tuned in Regional at full volume and it is in no sense of flattery but purely because I wish to accord praise to a worthy article, that I say at once that this famous factory has really surpassed itself in producing the Skyscraper kit.

Before continuing with my description of the actual test, may I explain that the Lissen Skyscraper constructor's kit employs the new Lissen shielded coil in conjunction with a screen grid detector and pentode circuit.

A Lissen metallised h.f. valve is used in the first stage, the second stage is a Lissen Det-valve and the output valve is the Lissen economy power pentode valve. The transformer is, of course, the well-known Lissen Hypernik. All of the components are mounted on an aluminium chassis, fitted with a neat and attractively finished panel.

Fitted for a Gramophone Pick-up

The receiver is fitted for the use of a gramophone pick-up and terminals are provided for the addition of an extra loudspeaker if required. The Consolette kit, complete with valves and a specially matched loudspeaker, costs £6 5s. and the table model £5 5s.

The kit alone, exclusive of cabinet but complete with the three valves, costs 89s 6d. I must accord my meed of praise to the cleverly-designed cabinet; it is well made and beautifully finished, and coupled with the very modern lines of the set itself it should meet the most exacting requirements.

Over Forty Stations

Reverting now to my test, in one evening I received over 40 stations, the weakest of them being at comfortable loudspeaker strength. Over a half of this number were foreigners, from which it will be gauged that the set reaches out.

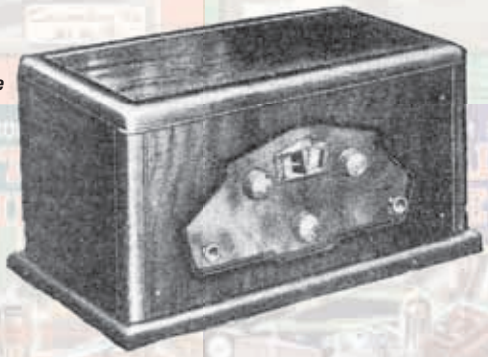
No difficulty whatever was experienced in separating any of the stations, either British or foreign and in no instance did I experience jamming. The tuning is delightfully easy and selective – no finicky knob-twiddling – and the reaction is smooth; it does not come on with a bump and weak stations can be 'built-up' to comfortable volume without distortion and without working too near to the point of oscillation.

I welcome the lead, which Lissen have given in providing a **complete** kit – a much better arrangement than leaving the inexperienced Amateur to choose his own valves, etc., only quite wrongly to blame the set when really the valves are to blame. I welcome, too, the provision of pick-up terminals, for more and more listeners aretending to combine radio with the gramophone.

I repeat – a splendid kit, which will satisfy the most exacting requirements.

F. J. C.

Another style of cabinet for the Lissen Skyscraper – the Table Model.



Rear view, showing battery space, built-in speaker, dual range shielded coil, Lissen valves, etc.

Issue 1
1932

Kit: The Lissen Skyscraper
Makers: Lissen Limited, Worple Road, Isleworth, Middlesex.
Specification: All-metal chassis, shielded coils, screened grid, detector and pentode valves, metal panel, two styles of cabinet – all-in Consolette and Table model. Pick-up terminals fitted. Complete with valves, matched speaker and cabinet (walnut). Constructional chart in two colours included.

COMET

HF antennas for any location

Comet H422 in use at GB0SH Strumble Head Lighthouse with Matthias M1DCV and Oliver MW3SDO.

H 422
4 Band Rotary Dipole

Features

• Frequency bands	7, 14, 21, 28 MHz
• Impedance	50 ohms nominal
• Input connector	SO239
• Power rating	1kW PEP
• Maximum wind speed	35m/sec
• Length	10.4m (straight), 7.4m (V)
• Weight	5.4kg
• Suitable mast dia	38-62mm

Put out a bigger signal with this NEW 4 Band trapped dipole. Use it as a fixed or rotary antenna. Rotate it to put the maximum signal where you need it and to reject interference from the sides. Use it as a Vee or straight dipole from as low as 10ft high! With high quality Japanese construction the H422 handles 1kW PEP with ease. It's ideal for home or portable operation.

• Includes 2kW Balun for optimum pattern and match to 50 ohm coax.

£169.00 P&P £10

CWA 1000
Trapped Dipole

• Operating bands	80, 40, 20, 15, 10m
• Maximum power	500W PEP
• Total length	19.9m

A beautifully engineered Japanese Antenna covering the main HF bands (WARC bands with a tuner). Supplied with all fittings, balun and insulators.

£79.95 P&P £10

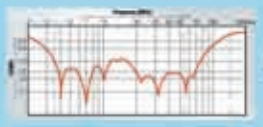
CHA 250B
Wide-Band Vertical

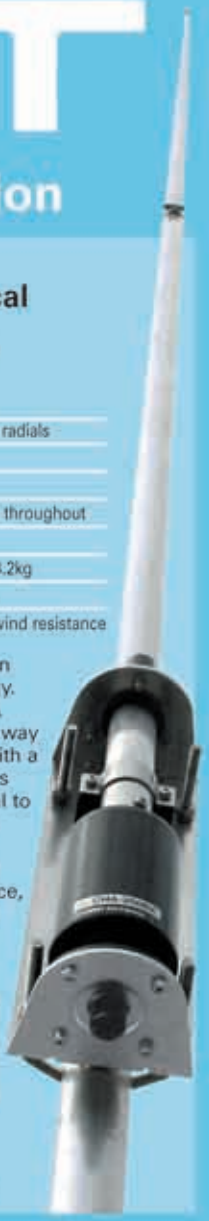
Covers 80m to 6m with no ATU and no gaps

Features

- Mounts at any height - needs no radials
- Transmit 80m through to 6m
- Receive 2 MHz - 90 MHz
- Transmit VSWR better than 1.5:1 throughout
- Rated at 250W PEP
- Only 7.2m high, weighs a mere 3.2kg
- Great performance on all bands
- Very low visual impact and low wind resistance

An absolute breakthrough in amateur antenna technology. The brand new Comet CHA 250B vertical covers all the way from 80m through to 6m with a VSWR of less than 1.5:1. It's probably the easiest vertical to install, simply mounting on any pole and requiring no radials. If you are restricted for antenna installation space, the CHA-250B could be the perfect answer.





£299.95 P&P £10

HF Antennas

VA-250	HF base aerial for 3.5-50mhz	199.00

VHF/UHF Base Antennas

GP1	144/430 MHz 3.0 / 6.0dbi 1.25m	49.00
GP3	144/430 MHz 4.5 / 7.2dbi 1.78m	59.95
GP6	144/430 MHz 6.5 / 9.0dbi 3.07m	89.95
GP9	144/430 MHz 8.5 / 11.9dbi 5.15m	129.95
GP15N	50/144/430 MHz 3 / 6.2 / 8.6dbi 2.42m	89.95
GP98	144/430/1200 MHz 2.94m long	129.95

Mobile Mag Mount Antennas

M24M	144/430MHz 1.7 / 4.17dbi 0.48m Long	24.00
M72S	144/430MHz 1.7 / 3.5 dbi 0.52m Long	24.95

HF Mobile Whips PL259 Fitting

CHS7	7MHz 1.6m long 250W	29.95
CHS10	10MHz 1.05m long 250W	29.95
CHS14	14MHz 0.95 long 250W	29.95
CHS21	21MHz 0.95m long 300W	29.95
CHS28	28MHz 0.95m long 300W	29.95
CHS50	50MHz 0.95m long 300W	29.95
HA035	3.5MHz 1.13m long 120W	39.95
HR50	50MHz 2.13m long 200W	39.95
UHV4	28/50144/430MHz 100/200W 1.39m long	69.95
UHV6	7/21/28/50144/430MHz 100/200W 1.9m long	79.95

VHF/UHF Mobile Whips PL259 Fitting

CA285	50/144MHz 1.32m long	24.95
CHL350	28/50MHz 2.16m long 200W	39.95
SB14	50/144/430MHz 1.08m long	39.95
SB15	50/144MHz 1.53m long 120W	39.95
SBB2	144/430MHz 0.46m long 60W - black	19.95
SBB4	144/430MHz 0.92m long 60W - black	29.95
CSB7500	Super Beam mobile whip 144/430Mhz	41.95
CSB7700	Super Beam mobile whip 144/430Mhz	49.95
CSB7900	Super Beam mobile whip 144/430Mhz	59.95

Handy Antennas

CH99	BNC Tele Whip 70-1000MHz 195-1135mm L	14.95
CHF8	16 3.5/28/50MHz 74cm L 10W or Yaesu FT817	39.95
RX5	144/430/900MHz 44cm L 8W SMA	26.95
RX7	144/430/900MHz 44cm L 8W BNC	27.50
SH95	144/430/1200MHz 37cm L 10W BNC	27.95
SMA3	144/430/900MHz 25cm L 10W SMA	22.50
SMA99	70-1000MHz 1.1mm max L Telescopic SMA	14.95

Mag Mounts SO239 fitting

MG4M	110mm dia. c/w 4m cable + PL259	24.95
MGM58	89mm dia. c/w 4m cable + PL259	16.95
MGSRM	78mm dia. c/w 4m cable + PL259	22.95

Antenna Mounts

RS6	Roof Rack Mount - adjustable	15.00
RS550	Roof Rack Mount - deluxe adjustable	15.95
RS700	Gutter Mount adjustable	15.95
RS730	Trunk lip Mount adjustable	19.95
RMS	Magnetically mounted Gutter Clamp	25.00
WS1M	Window Mount deluxe SO239 plug	39.00
WS1B	Window Mount deluxe BNC plug	39.00
CMT650	Radial extension Mount - for HF whip antennas	39.00

Car/Caravan Mounts

MCB11	Base pole & stand	52.95
CAUBR	Trailer Mount - for HF whip antennas	39.00

Cable Assemblies

3K054M	4 metre cable SO239 to PL259 plug	24.50
HM10	1 metre cable SO239 socket to BNC plug	8.50
3D4M	4 metre cable SO239 to PL259 plug	15.50

Duplexers

CF360A	28/50Mhz w/leads SO239 - PL259/PL259	34.00
CF416A	144/430MHz w/leads SO239 - PL259/PL259	27.50
CF416B	144/430MHz w/leads SO239 - PL259/N male	28.50
CF503C	50/144MHz Sockets SO239 - PL259/PL259	34.00
CF530C	50/144MHz w/leads SO239 - PL259/PL259	34.00
CF530A	50/430MHz w/lead PL259 - SO239/SO239	34.00
CF416OB	144/430MHz Sockets SO239 - PL259/PL259	29.00

Triplexers

CFX431A	144/430/1200MHz N socket/PL259/N/N	46.00
CFX514N	50/144/430/MHz SO239/PL259/PL259/N	47.95

Baluns

CBL30	Balun (1:1) 1.7 - 30 MHz 1kW	21.95
TF400	Current balun 1.3 - 500MHz 400W	59.00
TF1800	Current balun 1.3 - 500MHz 1.8kW	69.00
TF5000	Current balun 1.3 - 500MHz 5 kW	79.00

Low Pass Filters

CF30H	Low Pass Filter 32 MHz 2kW	79.95
CF30MR	Low Pass Filter 32 MHz 1kW	29.95
CF30S	Low Pass Filter 32 Mhz 150 Watt	19.95
CF50MR	Low Pass Filter 57 MHz 1kW	29.95
CF50S	Low Pass Filter 57 MHz 150W	19.95

Line Noise Filters

TRF15	AC/DC line filter 15amp	64.95
TRF20	AC/DC line filter 20amp	69.95
TRF30	AC/DC line filter 30amp	89.95

Dummy Loads

D21M	Dummy Load DC- 600 MHz 100W PEP	18.50
DL1500C	Dummy Load DC- 600 MHz 1.5kW PEP	169.00

Earphones

H20F	Clip over earpiece - Yaesu Icom etc	12.50
H20K	Clip over earpiece - Kenwood	12.50

Lightning Arrestors

CS400P	Lightning Arrestor DC- 500MHz 500W	17.95

SWR/Power Meter
CD300H
1.8 - 30MHz 30/300/3kW
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2 way Antenna Switch
CSW201G
SO239 sockets DC- 600 MHz 1.5kW
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2kW Balun
CBL2000
1.7 - 60 MHz 2kW 50 Ohm 1:1
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The Long Range Express Three

It is far easier to design a good set than to invent a good name for it; we have titled this The Long Range Express in an effort to convey that the set will receive distant stations and that you may quickly tune them in. If we have failed to convey this to you, we certainly have not failed to do what we set out to achieve so far as the set itself is concerned.

The set was designed to incorporate the new Cossor variable mu valve and as a result of many weeks testing and matching we have finally arrived at the design shown here and which, we feel fully justifies the headline at the top of this page, The Set of the Year. For we are not indulging in extravagant language when we describe it as a go-getter. Station after station is brought in as the two tuning controls are operated.

Most modern battery sets appear to be designed for those many listeners who cannot afford mains-driven receivers and seldom for listeners who cannot use electric sets because their house is not equipped with electric light. This receiver is definitely designed as a first-class battery set to meet the demand for a really efficient instrument for use with batteries and is not a set designed to spare the last penny. On the other hand, expense has been kept within very reasonable limits.

The set described here has been developed on up-to-the-minute lines and contains refinements that are seldom met with in a battery set, while it is probably true to say that so many refinements have never before been included in one receiver.

Many constructors are under the impression that real tone and volume are not to be expected from a battery-driven set but this is not true of the Long-range Express Three, which achieves remarkable reproduction owing to the tone correction and other advanced features described below.

Outstanding Features

The constructor will naturally be interested to know what points of design make the Long Range Express Three such an outstanding receiver. First of all, the set has been definitely designed around valves, each picked to perform a separate function and not the reverse way, which is too often the case. A moment's reflection will show that the characteristics of a valve cannot be made to suit the circuit to any extent, but it is possible by careful design to make the circuit suit the valves.

Starting a survey of the set in a logical order, attention is first drawn to the aerial coil, which has the distinction of having a separate winding for aerial and grid. This arrangement keeps the dial readings reasonably constant with various types of aerials and also minimizes some forms of local interference, whilst, in addition, tuning is considerable sharpened.

The screen-grid valve takes the form of a variable mu valve, which gives perfect control of volume and permits selectivity to be adequately controlled, while distortion on the local station, so common with the ordinary S.G. valve, is completely avoided. The next point to engage attention is the detector valve, which employs shunt-fed transformer coupling, permitting the transformer to give correct bass response – a feature that is at once apparent when listening to the Long Range Express Three.

It should be fully understood that this arrangement give absolutely true bass and not the boom effect associated with many foreign receivers. It may be pointed out that this arrangement also has the effect of making reaction delightfully smooth when used in conjunction with a well-designed coil.

The Output Stage

This is of considerable importance and reference to the theoretical circuit will show that considerable care has been taken. A pentode is used to ensure a really generous output for a low value of h.t. consumption, while a centre tapped output choke is provided in order to match the impedance of the average loud-speaker to suit the correct load of the valve.

All loud-speakers, except moving coil types, have characteristics that make them unsuitable for use with a pentode valve, which is the reason why the enormous advantages of this type of valve are not generally realised. This fact has been taken into account in the design of this set, and the necessary compensation fitted, which takes the form of a resistance and condenser connected across the loud-speaker terminals. A pentode valve should never be used without this tone compensator

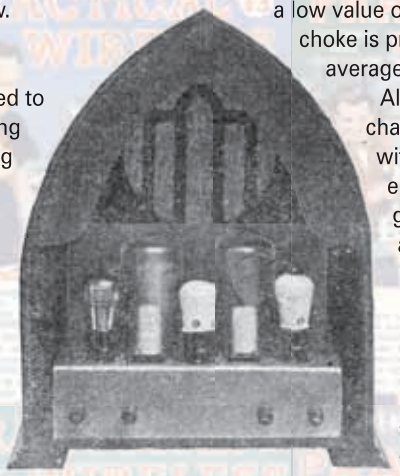


Fig. 1: Rear view of the very attractive cabinet of the Long Range Express Three, showing the neat arrangement of the chassis.

A fine and ultra-modern variable-Mu screened-grid detector and pentode set, incorporating the very latest components. It has very wide range, plenty of power, and knife-edge selectivity. It has been specially designed by our experts and is described here by Percy Ray.

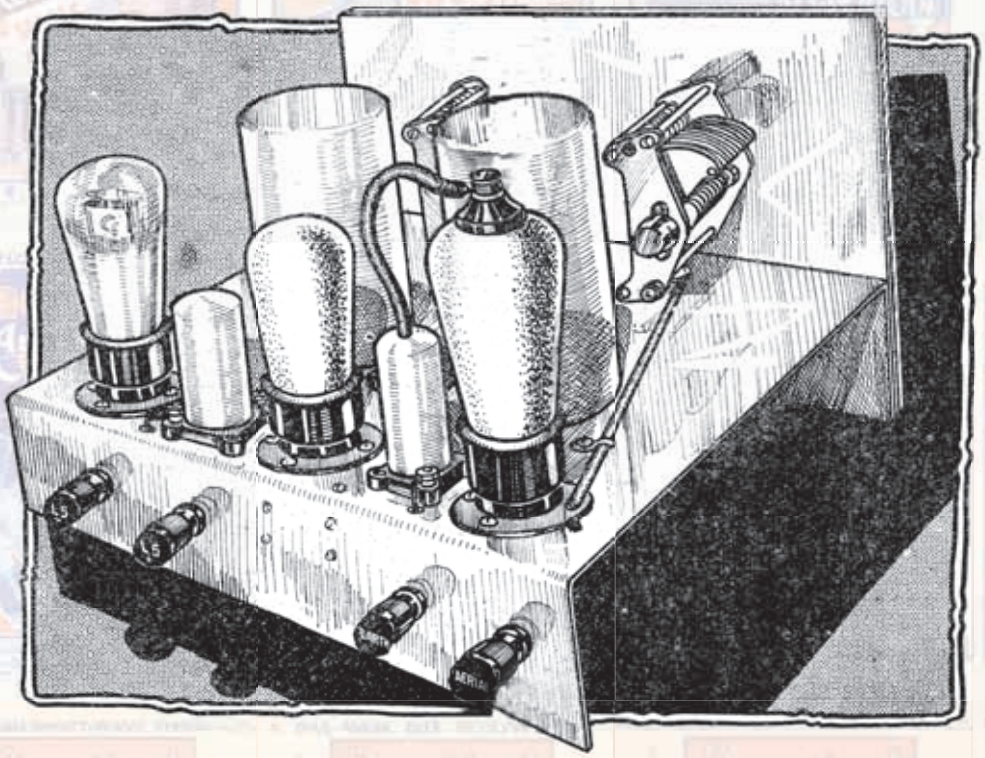


Fig. 2: Perspective view of the set, showing the simplicity of the above-chassis wiring and lay-out. Compare this sketch with the photograph below.

unless a moving coil type of loud-speaker is used.

After explaining the details of this receiver it will not be necessary to warn the constructor that it is absolutely fatal to change any of the components or to vary the layout a single inch. Arrangements have been made to have available a metal chassis ready drilled with perfect accuracy, so that every Long Range Express Three that is built will give the same remarkable performance as the designer's original.

The blue print available will naturally be the chief guide to assembly, but there are one or two points that should be carefully noted, as accidents may occur or part of the assembly may have to be pulled down to obtain access for fitting certain components, unless the correct order of procedure is preserved.

The Assembly

Begin by mounting the valve-holders, taking care to fix them with their terminals in the position shown on the blue print, also not overlooking the fact that the five-pin holder has to be at the end nearest to the loud-speaker terminals.

It is advisable not to fix the coils until all other components are secured in position, as there is danger of pulling one of the leads and cutting the insulation on an edge of aluminium; the reason for the flexible leads is to obviate the uncertainty of small terminals in impossible positions, which is a fault found with most other coils.

Next, complete the top of the chassis, being careful to mount the standard choke with countersunk head screws, otherwise one of the underside components is prevented from laying flat.

When all the top components are fixed, with the exception of the coils, the lower side of the chassis may be commenced but do not attempt to reverse this order. The two Wearite chokes earth their metal cans by means of an eyelet on one of the fixing holes, it is therefore imperative that these eyelets should not be interfered with, but that a screw of the correct size be used.

Next, mount the coils in position; access is obtained by removing the can from the base, which is detached by a small rotary movement like removing an electric lamp from its holder. When the coil leads have been slipped through their corresponding holes in the base and the latter bolted in position, the cans should be replaced and turned firmly to lock them in position; it is advisable to connect the leads to their respective points so that they are out of the way. As it is difficult to make a join in these leads, make sure that the correct lead is selected and measure twice before cutting.

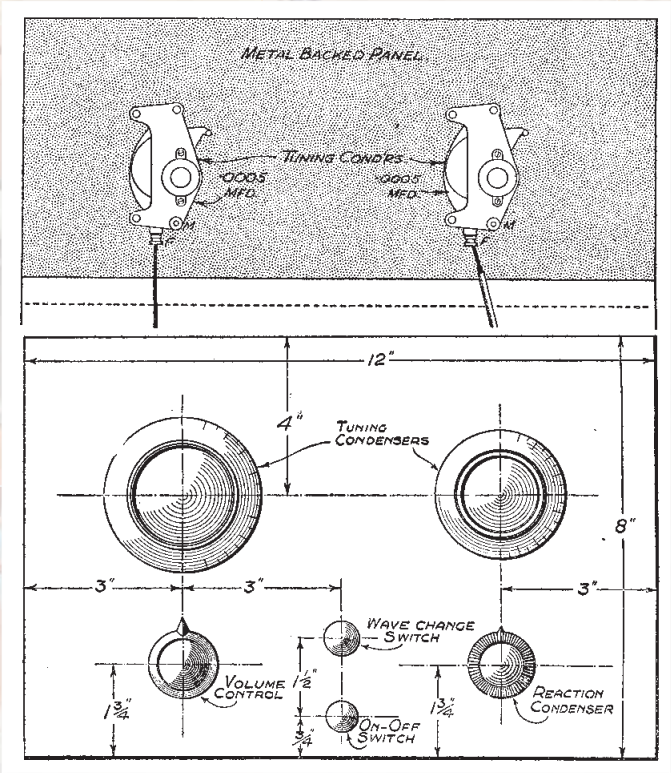


Fig. 3: These diagrams show (top) back of panel and (below) front of panel arrangement of controls.

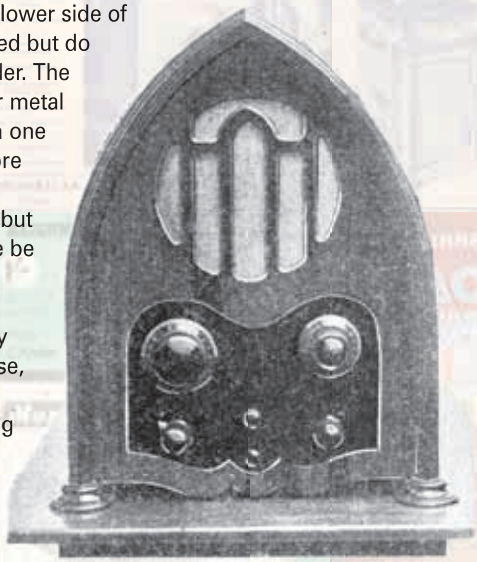


Fig. 4: This photograph very clearly shows the extremely attractive lines of the Panel and Cabinet of the Long Range Express. The two larger dials are the tuning condensers, the top centre knob is the wave change switch, the lower centre the on-off switch, the left lower knob the volume control, and the right lower knob the reaction condenser.

Wiring-Up

The wiring-up can now be commenced; the valve holder legs will only comfortably take one piece of Glazite, which should be used for making the connections, so when making the connection between the three positive filament legs a single piece must be used. Many of the leads are taken to the chassis, and in some cases the nearest point has not been taken; there is a reason for this, so do not be tempted to vary the connecting points shown.

When the internal connections are completed and checked, the flexible battery leads can be added, the actual length being governed by the individual requirements but in general it may be remarked that too long leads are as troublesome as unduly short ones.

On The Ether

Next, make sure that all connections are quite in order, as a mistake may be expensive. If satisfied that everything is exactly in accordance with the illustration, connect the accumulator, grid-bias battery and, lastly, the high tension battery; with the exception of h.t., this order is the safe sequence.

Now insert the valves in their correct order and connect the lead from the choke to the top terminal of the variable mu valve. Insert the h.t. – plug, connect aerial, earth and loud speaker and switch on the set will be ready for its first run on the ether. A fuse is not fitted, as these components usually fail to give the protection they should, and it is better to be without a fuse and use adequate care than rely on a fuse which fails.

Set the wave-change to the waveband required – in for long and out for short. Set reaction condenser to minimum (plates out of mesh) and volume control to maximum. Tuning is, of course, effected by the main tuning condensers. If the station is too loud, reduce it by means of the volume control: if, on the other hand, it is not loud enough, use the reaction, remembering to make a point of slightly readjusting the tuning condensers after making an adjustment to the reaction.

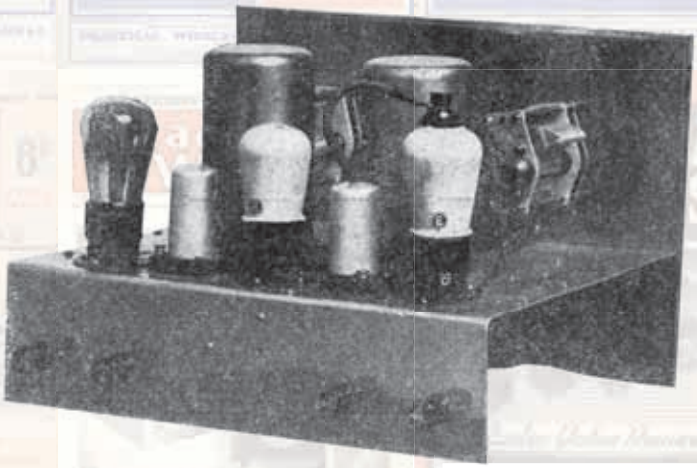
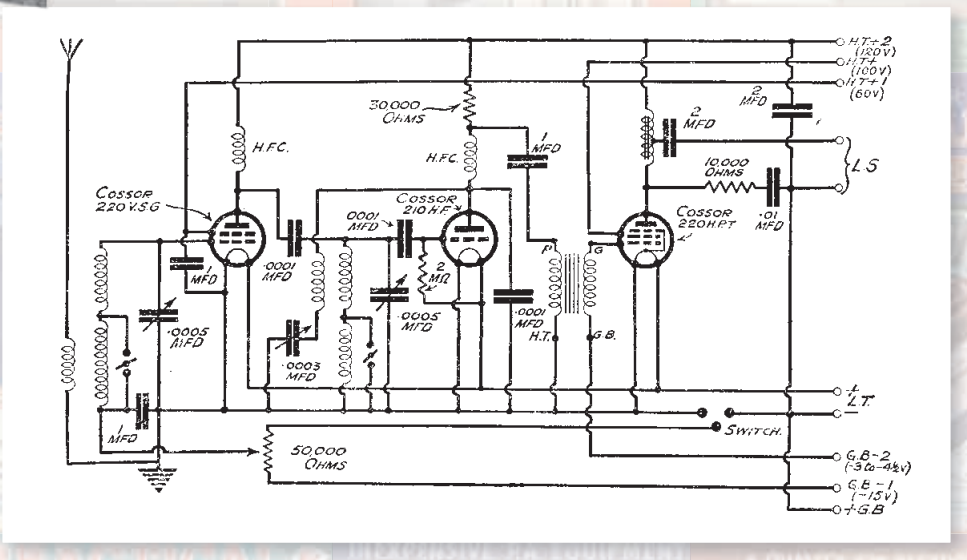


Fig. 5: Three-quarter rear view of the chassis.

List of components for the Long Range Express Three (Variable Mu, Screened-Grid)

2	Polar No. 2 .0005μF. Arable Condensers.
1	Pair Annoy Coils. Weartite Standard Screened h.f. Choke.
1	Wearite Special Screened h.f. Choke.
2	T.C.C. .0001μF. Type S. Fixed Condensers
1	T.C.C. .000μF. Upright 3-clip type Fixed Condenser.
1	T.C.C. .01μF Type S. Fixed Condenser.
1	mfd. Mansbridge Type Condr. (Lissen).
2	mfd. Mansbridge Type Condrs. (Lissen).
1	Dubilier 30,000Ω. 1W fixed resistance.
1	Dubilier 10,000Ω. 1W fixed resistance.
1	Lissen 2MΩ grid leak.
2	Clix 4-pin chassis mounting valve holder.
1	Varley Nicore II, No. D.P.2, l.f. Transformer.
1	Wearite 16 Henry 15Ma. l.f. Choke.
1	Wearite Ganged Wave-change switch.
1	Lissen Precision .0003μF Reaction condenser.
1	Lissen 3 point On and Off switch.
1	Lewcos 50,000Ω. Potentiometer.
4	Bulgin Panel Pointers.
4	Clix Spade terminals (Aerial, Earth, l.t.+, l.t.-).
6	Clix Wander Plugs (G.B.–2, G.B.–1, h.t..+, h.t.+1, h.t.+2, G.B.+).
3	Coils Lewcos Glazite.
1	Paroussi Long Range Express Three 16 gauge metal panel (12in. by 8in. and baseboard 12in. by 13in.).
1	Bulgin 7-way battery cord.
1	Celestion Soundex Moving Coil Loud speaker.
2	Ediswan 60V, super capacity h.t. batteries.
1	Lissen 9V grid bias battery.
1	Ever Ready 2V 80 ampere hour l.t. accumulator.
3	Cossor Valves 220 V.S.G., Metallised.210 h.f.. Metallised.220 H.P.T.
1	Osborn No. 235 Cabinet.



Circuit diagram of the Long-Range Express Three.

To Separate Stations

If two stations are overlapping, proceed as follows: turn the volume control down until the unwanted station has nearly disappeared – do not worry about the wanted one – and then by increasing the reaction and careful retuning the wanted station will return clear of the interference, it is all possible. This procedure applies to the elimination of a powerful local station, which is a relatively simple matter compared with the difficulties found with an ordinary s.g. set. The constructor will now be able to reap the reward of the few hours spent in tuning in a feast of stations and enjoying the quality and volume that is usually associated with all-mains equipment of high quality.

This month we look back at the very first PW!

News, Views and Memories from September 24th, 1932

Issue 1
1932

A Fuse Tip

In many sets a flash-lamp bulb is connected between the h.t. negative and l.t. negative to act as a fuse. Sometimes this bulb is fused and a spare one is not at hand when the set is wanted in a hurry for a particular item. In such cases there is no need to short the bulb holder or to alter the wiring of the set. All that is necessary is simply to remove the wire connecting the negative of the h.t. battery to h.t. negative terminal from this terminal – and join it instead direct to the l.t. negative terminal.

Radio Ramblings Fans at Radiolympia

I wonder what the exact risk figures were that must have been calculated by the publicity department of that enterprising valve firm who distributed fans to every 'fan' that wanted one during the first few days of Radiolympia? It was a master stroke of publicity and proves that British manufacturers are far more awake than certain people have us believe. Of course, it might have been cold and wet, we have had Augusts like that and as the fans must have been printed and made weeks before the exhibition, it was a decided 'feather in the caps' of those responsible. As it was, everybody carried one and it was so hot that representatives of rival firms had no qualms about giving free publicity to their competitor so long as they managed to keep moderately cool themselves.

A set in a hat! One of the novelties seen at the recent Wireless Exhibition.

Programme Mixing

How often have you listened to a radio play and wished that background of soft music was available? Or has not the occasion often arisen when you have played on your gramophone some dramatic speech or recitation and would have preferred a light musical accompaniment. These effects are possible if you possess a radio gramophone and the outlay necessary is for a component known as a fader. This is a Potentiometer with a centre tap and when connected in the circuit it is possible to arrange that radio signals are faded out to nothing and gramophone music is brought up to full volume by the mere rotation of one control. Or by suitably rearranging the connections, the two reproductions may be mixed to provide the effects mentioned in the opening sentences.

Shielding Transformers

Many transformers and chokes are supposed to be sufficiently shielded by their own covers but it is often found in practice that these covers are sadly lacking in shielding properties. One result of this is that in a mains operated set, you will get a hum owing to the circuits interacting with one another.

To properly serve as a shield the cover of the component should be of much thicker material than that generally used. The usual precaution to place transformers – for instance – the power transformer and any nearby inter-valve transformer – at right angles to one another goes a long way to avoiding trouble. However, and if you are not sure about it you might try connecting the inter-valve transformer by means of leads a few inches long, so that you can shift it about and turn it in different positions until you get the best results.

Camouflaging the Loud Speaker

No doubt many listeners have felt on occasions that the loud speaker could be less obtrusive and some manufacturers have also felt the same thing as is evidenced by more than one design. On the continent some quite ingenious ideas have been developed to dispense with one orthodox form of loud speaker in order not to mar the appearance of a room furnished in the ultra modern continental style. To assist readers who would like to experiment in this direction we may mention the following ideas:

The sounding board of a piano (that is the portion below the keyboard) will be found roomy enough at one end to accommodate a fair sized speaker. Provided this does not deal with too much power, the slight vibrations of the piano strings, which are set up will add tone to the reproduction. Naturally, if too much volume is used, the reproduction will suffer.

Some forms of easy chair or settee will have room at either the back or under the seat to take a moderate size of cabinet speaker. Of course, if kapok, hair or similar filling is used this idea is impracticable. Some of the box spring types of furniture will, however, permit this idea being carried out.

No doubt other ideas will present themselves to readers and it will often be found that the illusion of reality is greatly improved owing to the non-appearance of the wireless apparatus.

A selection of what was happening in the amateur Wireless hobby in the week of September 24th, 1932 – reprinted from very first issue of *Practical Wireless* – how much do you remember?

Test Voltage and Working Voltage

Most manufacturers have now abandoned the foolish practice of giving only the test voltage of their condensers and instead state the more useful working voltage. But even this can be misleading, for although the working high tension voltage of a mains set is, say 250V, it does not follow that a condenser having a working voltage of 250V is suitable. This is because the actual voltage when the set is first switched on and for some time after, is probably twice the normal figure.

It gradually falls to the nominal voltage as the valve heaters reach their working temperature but until this point is reached there is a negligible load on the high tension supply. When ordering condensers for use in an a.c. set it is thus always wise to specify those having a working voltage twice that of the set. Cheap components of foreign manufacturers should be carefully examined, whatever voltage is stamped on them, for it is rarely of significance whatsoever.

Cinema Projector Transformer

The firm of Radio Instruments (RI) are well known as makers of l.f. transformers and a new component recently introduced by them is the cinema projector transformer. This is designed to be used with the well-known home cinemas, which are on sale in this country but which are made abroad and consequently designed to operate at 100V or so. It is usual to employ a wire-wound resistance when connected to mains of higher voltage and as users of this apparatus have no doubt experienced quite a large amount of heat is radiated by the voltage-dropping resistance.

The new RI Cinema Projector Transformer.

The new transformer will therefore be found to be a useful substitute for the resistance and being furnished with a protected plug, will be quite safe to handle. Two models are manufactured, both suitable for mains voltages of 200-250 but one giving a 300W output and the other a 600W output .The price is £2 10s and £4 10s respectively.

Radio Luxembourg

The new 200kW Radio Luxembourg transmitter has started its preliminary tests on 1,275 metres, despite international protests regarding the choice of a wavelength. A young German woman, who is a fluent speaker of five languages, has been specifically engaged as studio announcer.

The Compagnie Luxembourgeoise de Radiodiffusion, who are owners and operators of this super-power station, will devote the Sunday programme hours entirely to broadcasts sponsored by British commercial firms. Publicity transmissions are also to be carried out on weekdays for French and German concerns. As no tax payable is by listeners in the Grand Duchy of Luxembourg the expenses of running the service will be entirely defrayed by revenues secured from advertisements.

Cut this out each week and paste it in a notebook.

Practical Wireless Data Sheet No. 1

The sizes marked with an asterix(*) are those chiefly used in wireless construction. The tap drill and clearing drills may be obtained in sizes 1 to 60, No.1 being .228in., dia. and No.60 .04in. dia. Beyond No.1 drill size letter drills from A to Z may be obtained. A being .234in dia., and Z .413in. Dia.

No.	Dia.	Tap Drill No.	Clearing Drill No.
*0	.236	12	15/64
1	.209	19	4
*2	.185	26	13
3	.161	30	29
*4	.142	34	28
5	.126	40	30
*6	.110	44	35
7	.098	48	40
8	.087	51	44
9	.075	53	48
10	.067	55	51
11	.059	57	53
12	.051	62	55

Gilbert Radio Service Tool

A tubular spanner accommodating a 2BA nut at one end and a 4BA one at the other; a 1/8in blade screwdriver and a 1/2in screwdriver recessed to take slotted terminals. These articles are combined in one tabular casing provided with a fountain pen clip so that the tool may be conveniently carried in the pocket.

A 6BA nut may be adjusted by reversing the recessed screwdriver and inserting it in the outer container. This is a very valuable little tool for the amateur constructor and, with a nickel-plated finish, costs only 2s. 6d.

Is Your Set Off Colour?


Is Your Set Off Colour?

In this article a member of our technical staff gives some of the reasons why your reception may gradually fall below standard after your receiver has been in use for some time and tells how you may restore its lost 'tune'.

If you ask the average listener, "How's the wireless going?" how often do you get the reply, "Oh, not too badly but it doesn't seem quite so good as it used to be"! In other words, how often do you find a set, which has been in use, say a year, functioning as well as when new? Very rarely, I suggest. And the reason is not simply because the valves are not new or because the h.t. battery is running low.

Admittedly, these are amongst the most obvious causes but, on the other hand, the valves and batteries may have just been renewed or a mains unit may have taken the place of the latter and still the set is not so loud or clear as at first! Where then shall we look for the cause of this subtle falling-off in quality and power? Well, there are three causes which contribute more than anything else toward poor reception of this sort. They are DUST, DAMP and DIRTY CONTACTS!

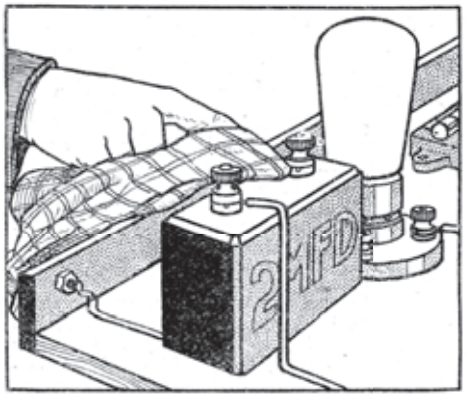


Fig. 1: In dusting, particular care should be taken to clean between the various terminals.

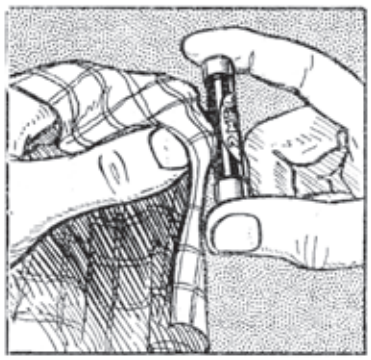


Fig. 2: To dust the grid leak remove it from the clips. Also, dust between the clips before replacing it.

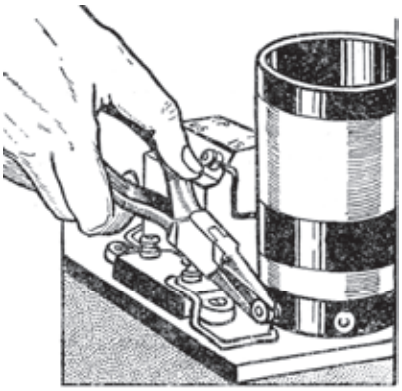


Fig. 3: After dusting see that no terminals have worked loose.

The Effects of Dust and Damp

In the early days of radio, when sets looked horribly scientific and bristled with exposed valves, coils, crystal detectors and terminals and so on, we were taught that dust and damp were the chief enemies of good reception and accordingly always kept a duster handy.

Nowadays, however, this fact is hardly mentioned, with the result that sets are often placed near the window to receive all the dust and rain that happens to blow in. I think this is partly because most modern sets, owing to their being enclosed, **appear** to be weatherproof.

That they are not necessarily water proof I had very strikingly brought home to me a short while ago. I was asked to examine a set, which the owner said was working very poorly, although he had done everything possible to keep it in good order. The batteries, he informed me, were well up and the aerial and earth connections in good order. Then I switched on. The set certainly sounded very wheezy, so I looked inside. It was full of dust and smelt rather musty. It was then that I noticed the state of the aerial coil.

The coil was of cotton-covered wire on a cardboard former, and was actually covered in **mildew!** This was, of course, an extreme case and yet the set had not been left open. It had merely been standing for a couple of years right under a window, and the dust and damp had somehow found its way through the hinges of the lid and back.

A Surprising Fact!

It is really astounding how dust will accumulate in a set that has apparently a close-fitting door to the case. There are, I know, quite a number of commercial sets, which are genuinely dust-proof but if your set is home-made or of the kit type, or has to be opened frequently for adjustments, it is almost certain to get dusty.

The reason that dust is injurious is because it forms a partial conductor. Dry dust does not conduct very readily but it is usually associated with atmospheric moisture, which gives it definite conducting properties. Thus a layer of damp dust over your set has much the same effect as would an infinite number of high-resistance grid leaks joined between all the various terminals. Each grid leak sneaks a fraction of your set's power.

While on the subject of dust and damp from without, let me mention that in the case of battery sets and portables, dampness may also come from within. Spray from the accumulator is well known, but how many people realise that the h.t. battery is only dry in name?

As a matter of fact, the h.t. battery wouldn't work if it were really dry: therefore it should always be scrapped before it gets to the stage where the zinc cells inside are eaten through and the salts ooze out and moisten the cardboard container.

Fortunately, this state does no usually set in until the voltage has dropped below a working figure and the battery is discarded on that account, although I have seen old batteries used in conjunction with a new one with the idea of boosting the voltage. This practice cannot be too strongly condemned!

The Cure

If your set is not giving its best, it may be due to one of the foregoing causes or due to dirty or faulty contacts, and a complete cure can usually be effected by giving it a little tuning-up. First of all, disconnect all leads, at the same time noting where each was joined, unless they are all marked and then take the set out of the cabinet.

Dust the set thoroughly, taking particular care to clean between all the terminals, especially those which are close together (see **Figs. 1** and **2**). The best way to remove dust from the vanes of the variable condensers is to blow it out with a bicycle pump or with a pair of bellows.

Having completed the dusting it is just as well before proceeding further, to dry the whole thing in front of the fire or to stand it in a warm gas oven (after the gas has been extinguished). Do not allow it to get hot, as excessive heat will warp Ebonite and melt the wax used in fixed condensers. If the gas oven is used it is best to leave the door on the jar to avoid condensation, which, needless to add, would have disastrous effects.

Go Over All Connections

Before returning the chassis to its case inspect all the connections, checking that all the terminals are screwed down tightly (a twist with a pair of pliers will do) and examine the contacts of the switches (see **Figs. 3** and **4**). The filament switch is often a source of trouble, as after constant use little splinters of metal rub off the electrodes and cause a bad contact.

The symptoms are crackling when you switch on or when you touch the switch and sometimes you have to switch off and on again before you get proper reception. Cleaning the switch carefully with a non-fluffy rag will make all the difference. In the case of a mains-operated set you may also be using a standard tumbler switch (of the same type as the house lighting switches) for switching on the mains. These are not always above reproach and it will pay to see that the contacts are clean and springy. Switch off at the meter (mains) before touching this switch, however.

Cleaning Spade Terminals

The receiver should now be replaced in the cabinet and reconnected. It is best to remove wander plugs and spade terminals from the aerial and battery leads and refit them.

This particularly applies to the l.t. leads where an accumulator is used, as although it is not noticeable until the covering is removed, the wires often corrode just where they join the terminal owing to the action of creeping acid and acid fumes (see **Fig. 5**).

Don't Forget the Aerial and Earth

Finally, let me say just a word or two about the aerial and earth system. If they have been in use for any length of time, the leads should be examined and all connections to both lead-in and lightning protection switch re-made. **Fig. 6** shows the points needing attention. The wire usually becomes very brittle at these points, and if you have enough wire to spare it is best to cut off the old ends and re-scrape the strands and join up again.

If necessary, re-make the joint between the earth wire and the earth tube or whatever connection you have (see **Fig. 7**).

The porcelain insulation of the aerial lead-in tube should also be wiped over with a cloth. See also that it has not been painted over, as may have happened if the house has been redecorated. Painters seem to delight in daubing insulators!

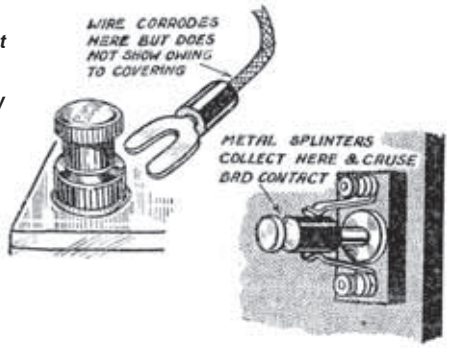


Fig. 4: A frequent cause of poor reception is dirty filament switch contacts.

Fig. 5: Why you should re-make terminal connections. Corrosion due to acid-creeping extends up the wire under the insulation.

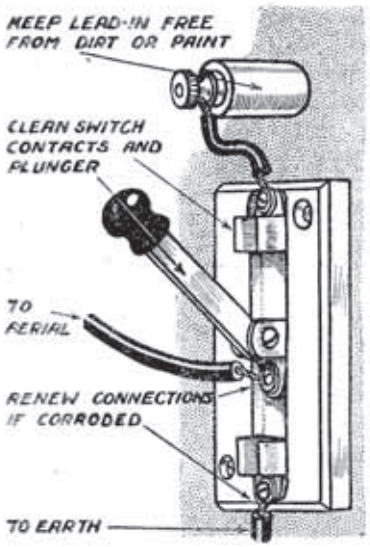


Fig. 6: A typical lead-in system with earthing switch, showing points needing occasional attention.

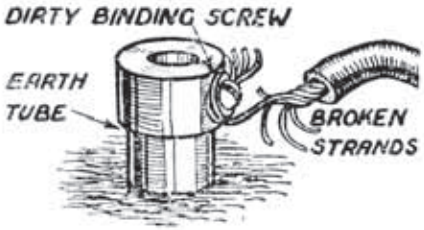


Fig. 7: Some likely causes of a poor earth.

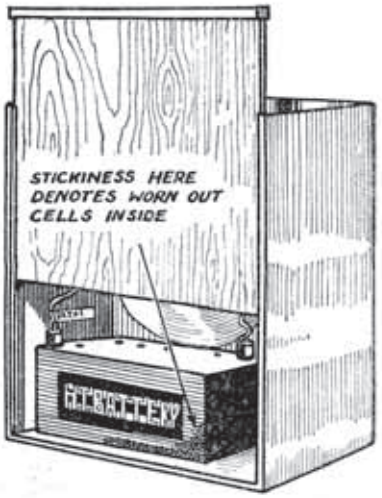
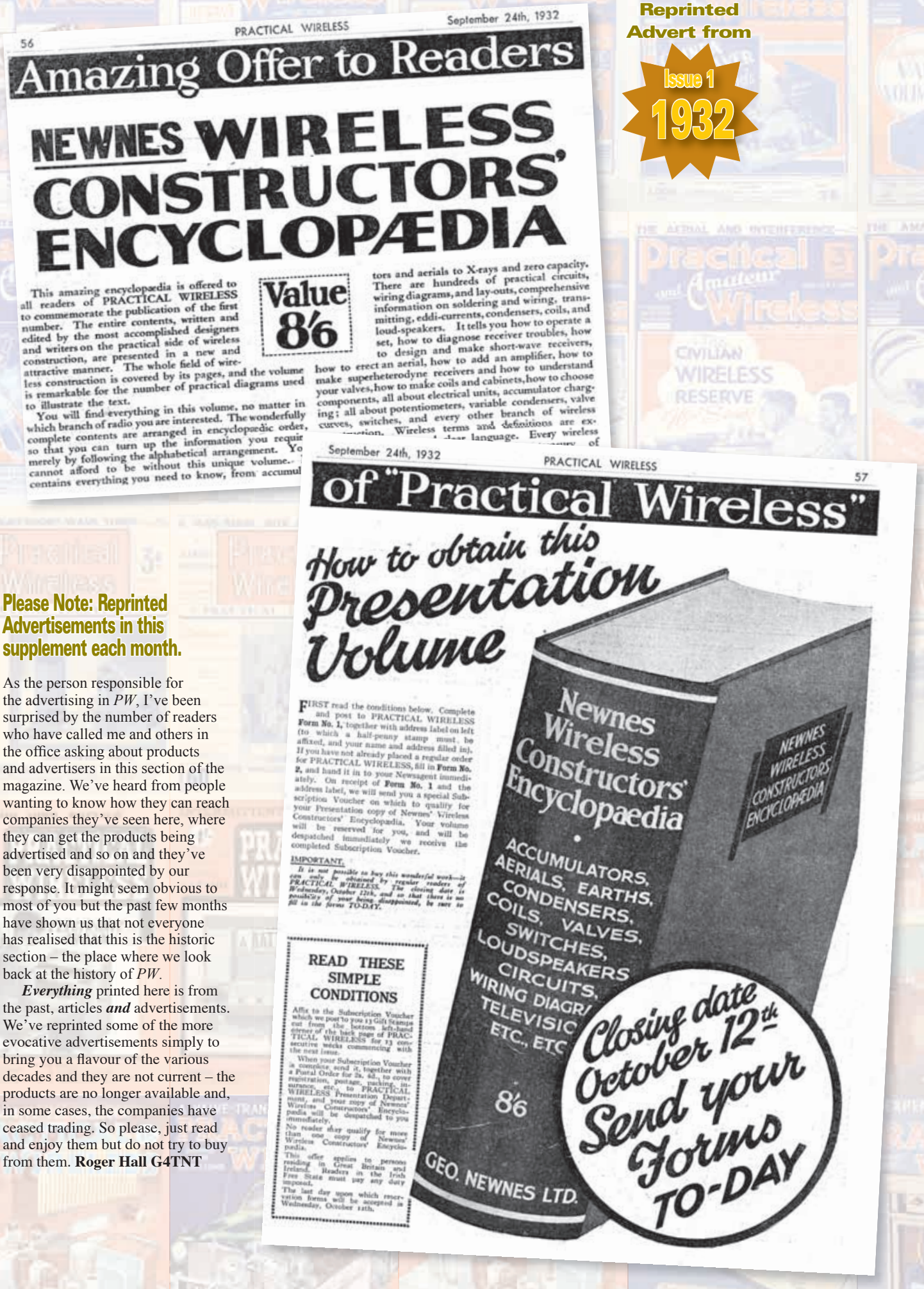


Fig. 8: Stickiness on the outside of the h.t. battery means deterioration and will cause harm if left in your set in such condition.

Now lower your aerial, clean the insulators, and haul it up again. If you pull it tight it will probably be several feet higher in the middle than previously. This is one of the many little things, which, taken together, will bring your reception back to its pristine brilliance. Having finished, you will now be able to sit down and listen to a set that has regained its lost youth!

Reprinted Advert from Issue 1 1932



56 PRACTICAL WIRELESS September 24th, 1932

Amazing Offer to Readers

NEWNES WIRELESS CONSTRUCTORS' ENCYCLOPÆDIA

This amazing encyclopædia is offered to all readers of PRACTICAL WIRELESS to commemorate the publication of the first number. The entire contents, written and edited by the most accomplished designers and writers on the practical side of wireless construction, are presented in a new and attractive manner. The whole field of wireless construction is covered by its pages, and the volume is remarkable for the number of practical diagrams used to illustrate the text.

Value 8/6

You will find everything in this volume, no matter in which branch of radio you are interested. The wonderfully complete contents are arranged in encyclopædic order, so that you can turn up the information you require merely by following the alphabetical arrangement. You cannot afford to be without this unique volume. It contains everything you need to know, from accumulators and aerials to X-rays and zero capacity. There are hundreds of practical circuits, wiring diagrams, and lay-outs, comprehensive information on soldering and wiring, transmitting, eddi-currents, condensers, coils, and loud-speakers. It tells you how to operate a set, how to diagnose receiver troubles, how to design and make short-wave receivers, how to erect an aerial, how to add an amplifier, how to make superheterodyne receivers and how to understand your valves, how to make coils and cabinets, how to choose components, all about electrical units, accumulator charging; all about potentiometers, variable condensers, valve curves, switches, and every other branch of wireless [illegible]. Wireless terms and definitions are explained in clear language. Every wireless

September 24th, 1932 PRACTICAL WIRELESS 57

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It is not possible to buy this wonderful work—it can only be obtained by regular readers of PRACTICAL WIRELESS. The closing date is Wednesday, October 12th, and so that there is no possibility of your being disappointed, be sure to fill in the forms TO-DAY.

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No reader may qualify for more than one copy of Newnes' Wireless Constructors' Encyclopædia.

This offer applies to persons residing in Great Britain and Ireland. Readers in the Irish Free State must pay any duty imposed.

The last day upon which reservation forms will be accepted is Wednesday, October 12th.

Please Note: Reprinted Advertisements in this supplement each month.

As the person responsible for the advertising in *PW*, I've been surprised by the number of readers who have called me and others in the office asking about products and advertisers in this section of the magazine. We've heard from people wanting to know how they can reach companies they've seen here, where they can get the products being advertised and so on and they've been very disappointed by our response. It might seem obvious to most of you but the past few months have shown us that not everyone has realised that this is the historic section – the place where we look back at the history of *PW*.

Everything printed here is from the past, articles ***and*** advertisements. We've reprinted some of the more evocative advertisements simply to bring you a flavour of the various decades and they are not current – the products are no longer available and, in some cases, the companies have ceased trading. So please, just read and enjoy them but do not try to buy from them. **Roger Hall G4TNT**

The pentode was the 'latest thing' in 1932!

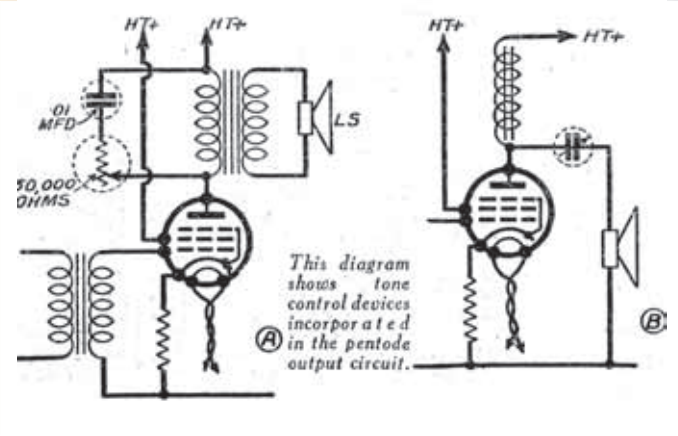
Using a Pentode

By Pentamp

When using a pentode valve a tone control is a valuable refinement.

Most amateur-made sets are not fitted with a tone control and the addition is well worthwhile. A tone control is most desirable when a pentode is employed in the output stage, because this type of valve tends to emphasise the high notes, so making reproduction rather screechy.

The two systems shown in A & B, however, are equally applicable to either pentode or ordinary three electrode valves, and although indirectly-heated valves are illustrated the same connections apply equally well to battery-fed ones.



This diagram shows tone control devices incorporated in the pentode output circuit.

Diagram A shows a 50,000 ohm variable resistance and .01μF. condenser connected in series across the primary winding of the output transformer. Decreasing the circuit resistance gives a gradual cut-off to the higher frequencies, so making the lower notes more prominent.

The resistance and condenser are equally effective, whether connected across the primary winding of an output transformer, across an output choke, or across the terminals of a directly-fed speaker. Diagram B illustrates a less common form of tone control and applies when the speaker is connected on the choke-capacity principle.

With this form of coupling it is usual to employ a fixed condenser of about 1μF but experiment shows that low-note reproduction is often improved by reducing the capacity of the condenser to about 0.25μF tone control can therefore be obtained by using, say, three condensers of 0.1μF, 0.15μF. and 0.25μF and so arranging them that they may all be connected in parallel or that one, or two, can be used separately.

The connections will be as follows: connect one terminal of each condenser to the plate of the output valve and take each of the other terminals to those of a rotary switch of which the slider is joined to the loud-speaker. The switch should be wired so that capacities of 0.1μF, .025μF or .05μF can be obtained by using the first condenser by itself, putting the first two in parallel or by connecting all three in parallel.

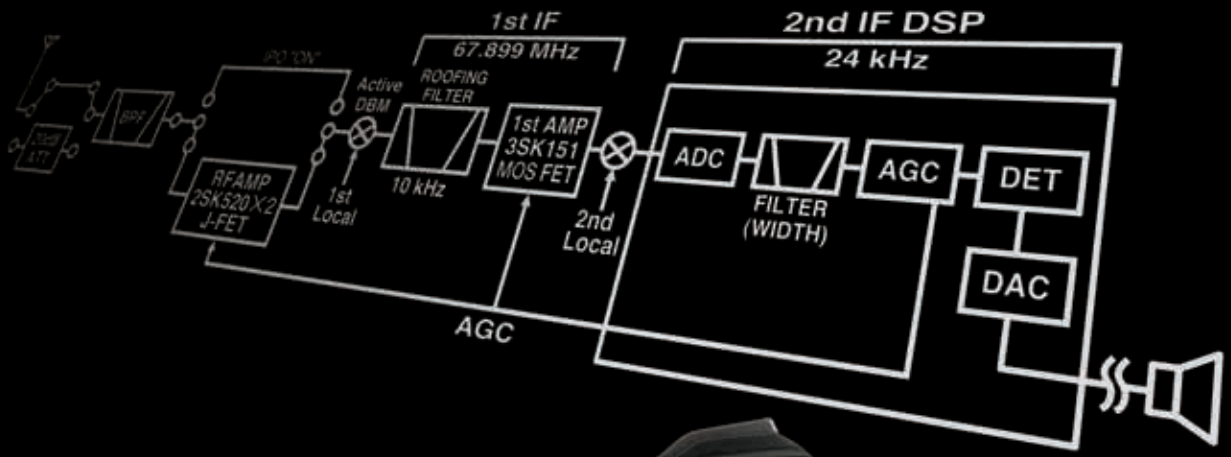
In addition to the above schemes, special types of pentode output transformers and chokes are obtainable. These enable the impedance of the valve to be correctly matched.

Reprinted Advert from Issue 1 1932

FT-450

HF/50MHz 100W All Mode Transceiver

World Class Performance in an easy to operate transceiver, with Yaesu's unique IF DSP



Available Now from £639.95 (inc VAT)

The FT-450 may be fitted with the optional automatic internal antenna tuner, the ATU-450.
The FT-450AT has the ATU-450 already installed.

YAESU

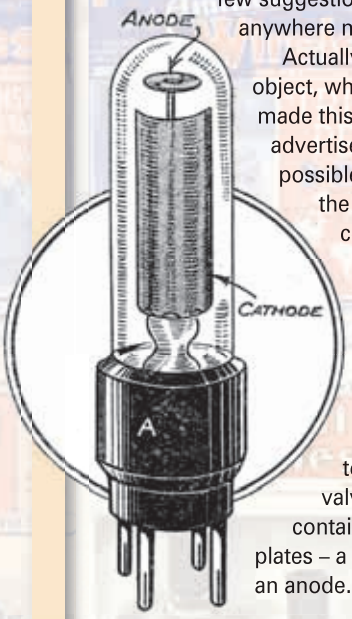
www.yaesu.co.uk

New technology in reported in *Practical Wireless* back in 1932

The Photo-Electric Cell

A great deal of interest has been aroused in the past few months by the animated show-window attractions, which are operated by the passer-by placing his hand over a small object on the window. It is quite amusing to hear some of the theories put forth as to "how it's done" – very few suggestions being anywhere near the mark.

Actually, the little object, which has made this type of advertisement possible is known as the Photo-electric cell, one type of which is illustrated here. The cell consists of a small glass tube – very similar to a wireless valve – and it contains two metal plates – a cathode and an anode.



The standard method of connecting the photo-electric cell.

In the type illustrated, an ordinary valve-base is fitted, the anode being joined to the anode pin and the cathode to the valve pin. The glass envelope is not evacuated but contains a gas. The peculiarity of this cell is that when a light is applied to the cathode electrons are emitted and if a positive potential is applied to the anode (as in a wireless valve) these electrons are attracted to the anode.

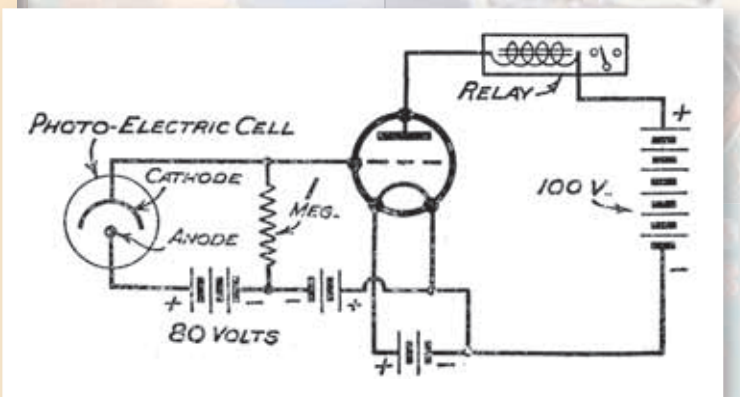
The circuit shows how the P.E.7 may be arranged in the grid circuit of a small l.f. or power valve, so that the application of any light on the cell will operate the relay in the anode circuit of the valve. If the cell connections are reversed the method of operation is also reversed, that is, a light shining on the cell will give a steady current in the anode circuit of the valve, holding the relay closed and, on the light source being interrupted, the relay will open.

There are a great many uses to which this cell may be put, amongst which may be mentioned burglar alarms, switching on or off lights at predetermined times or giving warning of the arrival of a customer in a shop. The enthusiastic amateur may devise many interesting experiments, which will be made possible by the operating of a relay by means of light control.

One or two suggestions may perhaps be given before closing these notes. A 60W lamp is most suitable for this particular cell and it should be arranged, with the circuit shown, at a distance of 3ft or so,and then gradually brought toward the cell.

If, before the lamp has been brought to the required distance from the cell the relay is operated, then it is necessary to reduce the cell potential. Alternatively, if the lamp has to be brought closer than 6in. before the relay is operated then the resistance across the grid circuit must be increased in value.

Where it is desired to operate the relay with only a weak source of light, the grid-bias should be lowered until the anode current is brought just below that value required to operate the relay. A slight increase in current caused by a weak light on the cell will then be sufficient to work the relay. Where any special requirements are to be met and any doubt is felt as to values of either applied potentials or resistance of relay, etc., the engineers of the B.T.H. Company will supply the necessary information.



The B.T.H. photo-electric cell showing the shape of the electrodes.

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Rob's chance to air his views!

Topical Talk

This month, thanks to a letter from a remarkable reader, Rob Mannion G3XFD is able to devote Topical Talk to a *PW* article published in 1933 and pay tribute to the 92 year old reader and author!

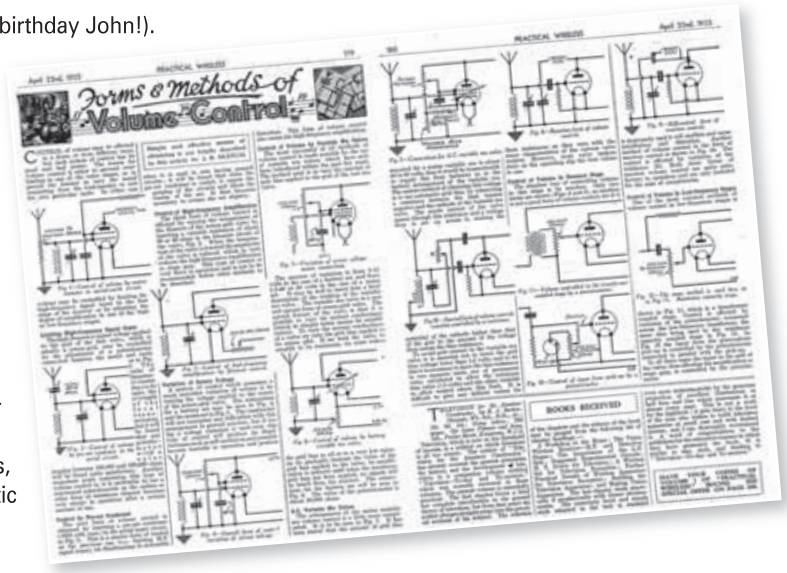
Although we work closely with our present day authors and know most of them very well, it's a fact of life that the majority of *PW* authors who wrote in the 1950s, 1940s and the pre-Second World days were mostly unknown to us – until the letter from **John Sketch GW3DDY** arrived!

With the exception of **Gordon King G4VFV** (now enjoying retirement at his home in Brixham, Devon) I have had few opportunities to get to know authors who wrote for *PW* in the golden age of hobby radio magazines. Gordon first wrote for *PW* in the 1940s and was a prolific author and is a great friend but John GW3DDY is an even more remarkable survivor and a link with *PW*'s earlier history.

Telephone Chat

I had an enjoyable telephone chat with John in his home in Cardiff. Speaking to him I realised that he was at least 91 years old due to the clues in his letter! However, I soon found out that he was about to celebrate his 92nd birthday on July 2nd, 2007. By the time you read this he would have enjoyed the day! (The *PW* team hope you enjoyed the birthday John!).

Sounding as though he was only in his late 50s, John seems a truly remarkable man and we hope to have his story in *PW* in the future. His writing skills (he thinks he received around 1 shilling – 5p for the 1933 article) led to other ideas, including romantic novels!


Forms & Methods of Volume Control

During our telephone conversation John told me that he considered that his ideas and circuits (as reproduced on this page) from 1933 as archaic and not worth considering. However, as I pointed out – the very first circuit featuring a potentiometer in the antenna circuit – can still be used today as a simple gain control!

I hope readers will enjoy the look back at John's work as much as I did. I'm sure that the story of his life with radio (including special radar work in the Second World War), will also be of great interest when its published in *PW*. Thank you John!

Rob Mannion G3XFD/EI5IW

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