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Icom IC-703



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October 2003

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YAESU FT-2800M

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SATURDAY 18th OCTOBER 2003

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Run by Bill & Betty
Jaycee Electronics



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 - *Trade stands & refreshments in adjacent hall
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**W&S 2004 RADIO
COMMUNICATIONS
EQUIPMENT GUIDE**
352 FULL COLOUR PAGES
PACKED WITH EXCITING PRODUCTS

carr: £1.50 £2.95



NEW PRODUCTS!!!

NEW HEIL QUIET PHONES

**Active Noise Cancelling
Headphones**

Ambient noise drops away as you switch
NR unit on. Amazing reduction! Fitted 3.5mm
1/4" jacks. Requires 1xAA battery.

£99.95 B

NEW YAESU FT-8800R

**Dual Band
Mobile 50/35W
AVAILABLE
SEPTEMBER**

NEW VX-2R

Dual Band Ultra Compact FM Handie.
The VX-2R is unbelievably small yet
provides 1.5W on 144MHz and 1W
on 430MHz (3/2W with external supply).
General coverage receiver 0.5-
999MHz, which includes AM medium-
wave & FM broadcast bands plus
AM aircraft & UHF TV bands.

COMING SOON



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ICOM IC-756 PRO II £1999 C



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

ICOM IC-7400 £1249 C



HF/VHF 100W
transceiver. Features
large LCD with
spectrum scope, auto
ATU and same DSP
system as IC-756PRO
II.

ICOM IC-706 IIG DSP £789 C



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

ICOM IC-703 NEW £599 C



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

ICOM IC-718 £499 C



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

ICOM IC-910X with 23cm £1249 C



Icom's all mode VHF/UHF
transceiver with 23cm.
Large clear LCD with lots of
facilities. 100W on VHF and
75W on UHF, 10W on 23cm.
IC-910H version £1149

KENWOOD TS-2000 £1599 C



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

KENWOOD TS-870S DSP £1399 C



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

KENWOOD TS-570DGE £849 C



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

YAESU FT-1000 MKV £2349 C



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

YAESU FT-1000 FIELD £1749 C



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

YAESU FT-897 NEW £989 C



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

YAESU FT-857 NEW £799 C



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

YAESU FT-847 £1199 C



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

YAESU FT-817 £539 C



160m - 70cms. Up to 5W output all
modes. Ours includes battery
and charger. **Add £110 for DSP ready fitted.**

**bhi DSP Module
now available!**

£89.95

NEW DSP Module

There is **NO** new FT-817 DSP! The fact is that the UK
manufacturers, bhi, (of whom we are their largest distribu-
tor), have produced a lovely 4-stage DSP module that can
be fitted inside the FT-817. The module costs £89 plus a
fitting charge of £25 for retro-fitting to existing models. This
includes installing a mini switch and LED on top cover.

NEW FT-817 Clip on metal front support stand.
In stock now £19.95 +£1 P&P

LINEAR AMP UK RANGER 811H £895 C



HF linear amp 160-10m
including WARC bands.
Drive 10-100W, output 800W
(max) CW. Soft start on
switch-on. Compatible with
all modern 100W HF rigs.
Silent running Papst fan.

AMERITRON AL-811 XCE £799 C



Ideal 600W HF Linear more
than enough for the full UK
limit. 160-10m including
WARC bands. Uses 3x 811A
low-cost valves. Matches all
modern 100W solid state HF
rigs. Silent running cooling fan.

PHONE FOR EXPERT ADVICE ON ANY ITEM



GENERAL ENQUIRIES:
01702 206835/204965
FREEPHONE ORDERLINE:
08000 73 73 88



carriage charges: A=£2.75, B=£6, C=£10

ICOM IC-2725E NEW £309 C



The Icom IC-2725 dual band FM transceiver is proving very popular. Easy to install, the controller is separated from the main unit - great where space is limited.

ICOM IC-207H £249 C



Great budget price dual band FM 50W/35W transceiver. Simple band operation. Front panel detachable from main unit if required.

ICOM IC-2100H £229 C



2m 55W FM mobile. Commercial grade, rugged construction. One piece die-cast aluminium chassis. Selectable green or amber display.

YAESU FT-8900R NEW £349 C

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



YAESU FT-2800M NEW £159 C

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



YAESU FT-1500M £179 B

Remarkably small and compact, yet built like a Battleship! Should last for years.



KENWOOD TMD-700E £449 C



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

KENWOOD TM-V7E £359 C



A lovely cool blue display, easy with 50/35W output. 50W/35W plus 280 memos and five storable operating profiles.

KENWOOD TM-G707E £289 C



If you are looking for simplicity and low cost, here's the answer. 2m & 70cm with detachable front panel and "Easy operation mode." GREAT!

IC-E208 NEW £319 B

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 *512 memories *FM narrow capability *104x2 DTCS, 50 CTCSS tone squelch *16 DTMF channels *HM-133 remote control mic *Packet ready for 9600/1200bps-mini DIN or 1200bps-mic socket *Supply 13.8V



YAESU VX-7R NEW £299 B



6m/2m/70cm

Available in Silver or Black



The VX-7R is the best outdoor handie ever. The case, keypad, speaker and connectors are all sealed against water damage. Wide Frequency coverage from 500kHz to 900MHz the VX-7R is ideal for monitoring a variety of broadcasts. The display is a dazzling 132x64 dot matrix providing easy-to-read frequencies and information plus pictorial graphics.

YAESU VX-110 £109 B



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

ICOM IC-E90 NEW £269 B



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

ICOM IC-T3H £129 B



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

KENWOOD TH-D7E £319 B



DATA COMMUNICATOR

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

KENWOOD TH-F7E £259 B



WITH EXTRA WIDE RX COVERAGE

• 144-146MHz Tx/Rx: FM
 • 430-440MHz Tx/Rx: FM
 Up to 6W out with Li-ion battery and "scanner" style coverage from 100kHz to 1300MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

KENWOOD TH-G71E £199 B



If you want an excellent 2m/70cm dual-band then you can't go wrong with the TH-G71. Fully functional with three power levels, 200 memories, CTCSS tone encoder/decoder, illuminated keypad and backlit LED.

MOTOROLA T-5512 £69.99 B



Motorola Dual Pack PMR-446 Recreational 2-Way radio
 • No Licence Fee or Airtime Charges
 • 8 Channels and 38 Codes
 • 3km Range
 • Lightweight
 • Water Resistant
 • Handsfree use (VOX)
 (with optional accessory)
 • Supplied with 2 belt clips

MOBILE ANTENNAS

WATSON ANTENNAS (PL-259 base type)

Comes with coax & BNC

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

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

MOBILE BASES

WATSON



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

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

BASE STATION ANTENNAS

DIAMOND

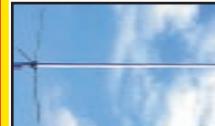


VHF/UHF Dual Bander

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

CHECK OUR WEBSITE FOR FULL DIAMOND RANGE

WATSON



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

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

WATSON SAFE-2-WAY NEW £89.95 B

AT LAST !! A HANDS FREE SYSTEM THAT REALLY WORKS!



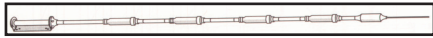
*Widely used commercially *Approved to Pan-European Standards *True Hands-Free *Noise Reducing *Acoustic Tailored Mic *Remote (3m) Latching PTT *Boom mic (3m) with Velcro *Adjustable gain *Adjustable Time-Out *Powered from rig mic socket *Ready made rig leads (£14.95 extra) *Also matches handhelds.

The **Safe-2-Way** mobile Interface is made for Watson in the UK by the same company that equips UK Police and Emergency services with similar units. Purchase the ready-made lead to match your radio and tuck the unit out of sight. The plug-in PTT and boom mic both have 3m leads for dressing around vehicle. Don't risk your Licence or people's lives! Drive with **Safe-2-Way**.

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

VERTICAL ANTENNAS

HUSTLER



6-BTV. HF 6-band vertical

6-BTV NEW	80-40-30-20-15-10m 1kW PEP	£239.95	C
5-BTV	80-40-20-15-10m 7.64m 1kW	£209.95	C
4-BTV	40-20-15-10m 6.52m 1kW PEP	£169.95	C

CUSHCRAFT



MA5V HF 5-band compact vertical.

MA5V	20-17-14-12-10m 250W PEP	£229.95	C
R8	40-30-20-17-15-12-10-6m 1.5kW	£529.95	C
R6000	20-17-15-12-10-6m 1.5kW PEP	£349.95	C

HORIZONTAL BEAMS & DIPOLES

CUSHCRAFT



MA-5B - Best Selling 5 band Mini-beam

Cushcraft prices increasing soon - Buy now!

MA-5B	10-12-15-17-20m 4 el. Yagi 2kW	£349.95	C
A4-S	10-15 & 20m 4 el. Yagi 2kW	£599.95	C
A3-WS	12 & 17m 3 el. Yagi 2kW	£399.95	C
X-7	20/15/10m 7 el. Yagi 2kW	£699.95	C
TEN-3	10m 3 el. Yagi 2kW	£219.95	C

RADIO WORKS



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

CW-160	160-10m 76.8m long	£139.95	C
CWS-160	160-10m 40.5m long	£134.95	C
CW-80	80-10m 40.5m long	£99.95	C
CWS-80	80-10m 20.1m long	£119.95	C
CW-40	40-10m 20.1m long	£94.95	C
CW-20	20-10m 10.36m long	£84.95	C
CW-620	20-6m 9.7m (32ft) long	£94.95	C
G5RV PLUS	80-10m with balun 31m (102ft) long	£64.95	B

MOBILE ANTENNAS

HUSTLER

Standard Resonator 400W (mast sections not included)



RM-10	10m 150-250kHz	£19.95	B
RM-11	11m 150-250kHz	£19.95	B
RM-12	12m 90-120kHz	£19.95	B
RM-15	15m 100-150kHz	£19.95	B
RM-17	17m 120-150kHz	£24.95	B
RM-20	20m 80-100kHz	£24.95	B
RM-30	30m 50-60kHz	£26.95	B
RM-40	40m 40-50kHz	£26.95	B
RM-80	80m 25-30kHz	£29.95	B

ALL HUSTLER ACCESSORIES IN STOCK - PHONE FOR QUOTE

MFJ-902 NEW £69.95 B



*3.5-30MHz (80 - 10m)
*150W
*Mobile and portable use
*SO-239 sockets
*Size w112x77x58 mm
*Weight 450g

The MFJ-902 uses real air variable capacitors (600V, 322pf) and three stacked powder iron toroids especially designed to handle power - not just QRP!

It is ideally suited for use with the IC-706MKIIG, FT-100D and FT-817 and other small rigs. Its got to be the world's smallest 150W, 80-10m antenna tuner. Operate anywhere, anytime with a quick easy set-up. The possibilities are endless. Tune out SWR on your mobile whip from inside the car. Operate with an antenna from within an apartment or a wire dropped from a hotel window. Its just as great for DXpeditions or Field Day. You can rely on it wherever you go! Its easy to pack away in your briefcase, suitcase or backpack.

MANSON EP-925 PSU £99.95 C



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

*Dual analogue meters *Over current protection *Large power terminals for rigs *Quick snap connectors for ancillaries

WATSON FC-130 Frequency Counter £59.95 B



SPECIAL PRICE

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

MFJ-461 Morse Code Reader £84.95 B



*Stand alone unit *Built-in mic *32char high contrast LCD *Automatic speed tracking *Serial port *Built-in speaker *9V PP3 (not included)
Simple PC program available (user supplies disk)

bhi NES10-2 & NES-5 DSP Speakers



NES10-2

£99.95 B

*Speaker with built-in DSP noise filters *Dip switches for 8 filter settings (NES10-2) *DSP settings preset, no user adjustment (NES-5)

*Plugs directly into 3.5mm speaker socket *Handles up to 5 Watts input *Max 2.5 Watts output *Requires 12V at 0.4 Amps max



NES-5

£79.95 B

bhi NEIM1031 £129.95 B



NOISE ELIMINATING IN-LINE MODULE

* Noise attn -20dB (typical) * Noise Attn levels 8
* Audio output power 2.5W RMS max (8 Ohms)
* Audio connections: Line level in/out (RCA Phono),
Audio in/out 3.5mm mono jack * Line in impedance 10K
* Line out impedance 100 Ohms * Line in sensitivity 300mV -2V RMS * Headphone socket 3.5mm mono jack * Power 12-24V DC 500mA

bhi 1042 SWITCH BOX £29.95 B



Connect more than one piece of equipment to your bhi noise eliminating speaker with the 1042 Switch Box.

Allows 6 pieces of equipment to be connected, 3 inputs loaded at 8 Ohms and 3 unloaded inputs (for low level signals). Two audio leads provided.

LDG Electronics

NEW AT-897

*1.8 to 54MHz *Power rating 10mW to 100W
*Dual function tune control button *Tunes 6-800 Ohm loads *Coax fed ants, dipoles, verticals & beams *Latching relays *Provides extra CAT port *Dual cross needle meters, illuminated *Sockets: SO-239
*Supply: 11-15V DC @ 300mA
*Size: 292 x 82 x 38.1mm *Weight: 907g

£249.95 B



AT-11MP

*1.8 to 30MHz
*5 - 150W
*RF sensed or optional leads
Alinco/Icom rigs
*6 to 800 Ohm loads *Coax fed ants, dipoles, verticals & beams
*Dual cross needle meters illuminated *Sockets: SO-239
*Tuning aid for the visually impaired (requires IC & LS)
*Supply: 11 to 15V DC
*Size: 242 x 210 x 64mm
*Weight 1.5kg (approx)



Asm £269.95 B

Kit £209.95 B

WEST MOUNTAIN RIGBLASTERS

RIGblaster pro Data interface 8-pin/mod, Cd & cables **£229.95 B**



The RIGblaster Pro

RIGblaster Plus	Data interface 8-pin/mod, Cd & cables	£139.95	B
RIGblaster M8	Data interface 8-pin, software & cables	£109.95	B
RIGblaster M4	Data interface 4-pin, software & cables	£109.95	B
Rigblaster RJ	Data interface RJ45, software & cables	£109.95	B
RIGblaster nomic8P	Data interface 8-pin, software & cables	£59.95	B
RIGblaster nomicRJ	Data interface RJ, software & cables	£59.95	B
FT100-CBL	Adapts all units to FT100 input	£12.95	A

AUDIO ACCESSORIES

HEIL



HCL-5/4



GM-4/5



HST-817



PROSET+

Desk Microphones

HCL-5/4 Classic retro-look HC-5/4 desk mic **£259.95 B**

Hand Microphones

GM-4/5 Goldline HC-4/HC-5 hand mic **£129.95 B**

Headsets & Boom microphones

HST-817 Traveler single side headset for FT-817 **£89.95 B**

HST-706 Traveler single side headset for IC-706 **£89.95 B**

Headphones & Boom Microphones

PRO-SET-PLUS Large H/phones with HC-4 & HC-5 **£199.95 B**

WATSON



WM-308



WEP-300B



QS-112

Base Microphones

WM-308 Desk electret mic c/w ML-308 **£59.95 B**

Earpieces

WEP-300B Over the ear, 3.5mm mono jk-plug **£2.95 A**

Speaker Microphones

QS-112(Y,K,I,M) H/hold spkr/mic (state which model) **£16.95 A**

TRANSMITTING LOGBOOK £4.99 A



Traditional Logbook for Radio Amateurs, A4 size, spiral bound for ease of use plus updated Prefix List and room for extra notes. A log is a legal requirement for any radio station.

NEW AT-1000



*1.8 to 54MHz
*Power rating 1000W SSB, 750W CW, 500W RTTY, Packet - 150W
*Power rating 100W (6m)
*Minimum tune drive 20W
*6-800 Ohm loads
*Handles up to 10:1 VSWR *Coax fed ants,

dipoles, verticals & beams *Tuning time 0.1 to 5 seconds, 3.0 average *SO-239 sockets *Supply: 11 to 15V DC @ 1A max
*Size: 230 x 75 x 330mm *Weight: 2.35kg

£599.95 C

RT-11



*1.8-54MHz *5-150W
*6-800 Ohm loads
*Remote Autotuner
*RF sensed *Dipoles, Verticals, Beams
*Water resistant enclosure *built-in lcom and Alinco connectivity
*Supply 11-15V DC
*Size 216 x 140 x 76mm
*Weight 1.14kg

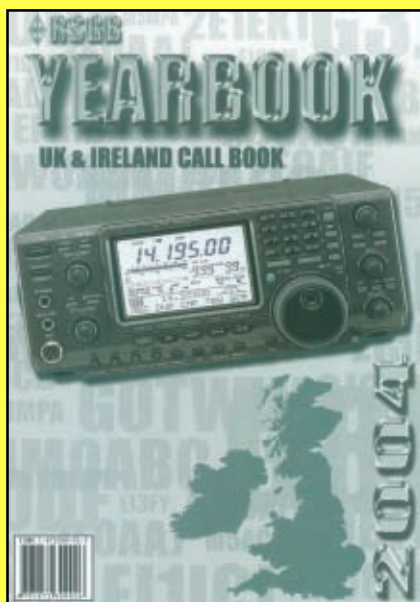
Asm £239.95 B

Kit £209.95 B

NEW

RSGB Bookshop

**Available at
the Leicester
Show**



Only £16.99

or £14.44 for RSGB members (plus P&P)

RSGB Yearbook 2004

Edited by Steve White, G3ZVW

The 2004 edition of the *RSGB Yearbook* is bigger than ever, with more pages in the Information section, more pages in the callsign listings section and more colour pages. Every page has been reviewed and updated from last year. The *Yearbook* reflects the current state of the hobby, with pages devoted to contesting, awards, satellites and propagation. New for the 2004 edition are pages on;

- Abbreviations & Codes,
- International Marconi Day
- RAYNET
- IOTA Honour Roll & Annual Listing.

More space has been allocated to trophies and awards, with more colour photos of the winners. The pages on repeaters have a new look, with coverage maps in colour of individual channels. Thanks to an increase in the number of amateur radio licences, the callsign listing section is bigger than ever. Additionally there is the callsign listing for the Irish Republic, for short wave listeners and short contest callsigns, plus surname and postcode listings. Plus the mass of information you have come to expect, and the most accurate and comprehensive UK and Eire callsign listings. All-in-all it adds up to a reference book that no radio amateur should be without. Everything you need at your fingertips, and with 472 pages excellent value.

DID YOU KNOW?

- Since Jan 2002 there have been over 6000 new M3 callsigns added to the Yearbook
- In Britain households move on average once every ten years

This could mean that if your Yearbook is over 2 years old it could be as much as 30% missing or inaccurate



Callseeker Plus 2004

Callseeker Plus is the popular CD version of the RSGB Yearbook with a powerful callsign search facility. This CD contains the complete contents of the RSGB 2004 Yearbook and much more.

All the information pages of the Yearbook are available and can be viewed using the Adobe Acrobat. The PDF format means you can see on screen or via your printer every page exactly as it appears in the printed Yearbook. A sophisticated yet easy to use Eurocall search program is provided to access the callsigns contained. Callseeker Plus 2003 provides the ideal medium for rapidly searching for all or part of a callsign, postcode, name, town, keyword etc. Additionally the CD also includes the following callsigns from across Europe: 9A, DL, EA, EI, ES, F, HA, HB9, I, LX, LY, OE, OH, ON, OZ, SM, SP, SV and Z3

Windows 95/98

Only £13.99

or £11.89 for RSGB members (plus P&P)

Note: These 2004 items are to be launched at the Leicester Amateur Radio Show on the 19th-20th September 2003

(Advance orders are taken from 1st September 2003)

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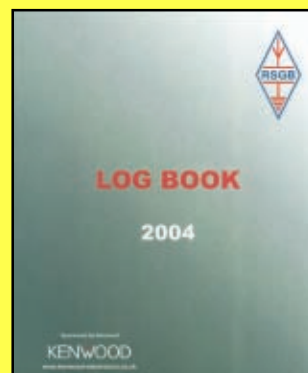
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October 2003

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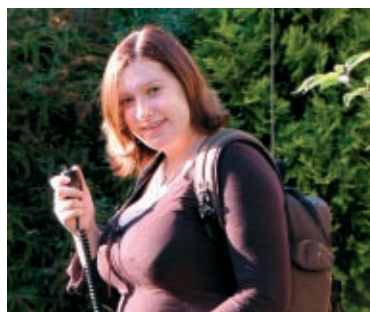


The IC-703 h.f./50MHz transceiver is the perfect companion for 'out and about' radio as Neill Taylor G4HLX discovered. So, sit back, enjoy the issue and don't forget to come and see at the Leicester Amateur Radio Show on 19/20th September. Design: Bob Kemp Photograph: Neill Taylor G4HLX.

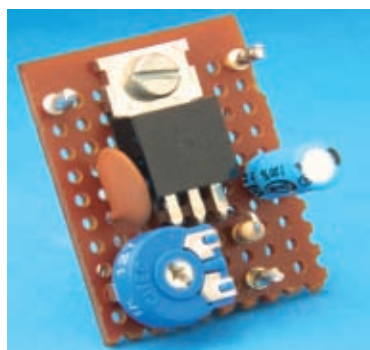
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32 Back on the Bench at Premier Radio

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36 Transceiver Performance - Simply Checked

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38 Icom IC-703 HF/50MHz Transceiver Review

Whether you're planning a family picnic or a spot of portable operating from a hill-top you won't go far wrong if you take the IC-703 along too. **Neill Taylor G4HLX** has been putting Icom's latest offering to the test and as you'll read he was pleasantly surprised by what it has got to offer.

44 Carrying on the Practical Way

George Dobbs G3RJV suggests using a little regulation this month... as he describes circuits that employ regulator chips.

46 Buying Second-Hand? - It Need Not Be Second Rate!

Bargain hunters everywhere should take note of the advice offered by keen rally fan **Ian Brothwell G4EAN** who enjoys buying second-hand equipment and says that - with care - you could end up with a real bargain!

50 Antenna Workshop

Alan Wightman 'climbs his ladder' once more as he's been busy equipping a New Forest campsite with cable TV. He suggests that similar installations can benefit Radio Amateurs who enjoy their hobby while on holiday.

52 Valve & Vintage

More nostalgic tales from **Charles Miller** as he continues with the story of his life with television and wireless.



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rob mannion's keylines

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

I normally try to avoid entering the world of national politics...but the latest Government-versus-the-BBC 'stand off' regarding the latter's journalistic approach invites comment from our specialist corner. I suggest this because in recent years it seems to me that BBC journalism standards have deteriorated.

Of course, I make mistakes myself producing a monthly magazine and also realise that TV and radio news is produced in a much more highly pressurised working environment. But there does seem to be many annoying and totally unnecessary errors nowadays...particularly (as an example) from the BBC South Studio complex in Southampton, Hampshire which provides both TV and radio news and information.

The problems from Southampton include teletext stories that don't provide essential information (such as informing viewers of an accident by a seaside pier...but not saying where the pier was!) and glaring mistakes where Andover (Hampshire) has been inferred as being in Wiltshire by being mentioned as 'near Salisbury', etc.

To be fair though, BBC South is a training ground for new staff and the through-put of journalists and presenters - with one or two exceptions - is rapid! Staff in this position cannot expect to get to know and acquire a 'feel' for an area so as to report accurately. However, this type of annoying problem is really small beer when it comes to a recent prime time TV news item.

Unbalanced Reporting

Recently during the BBC's main 6 to 6.30pm evening news programme, I was shocked and angered at the totally uninformed and unbalanced way the programme treated Scottish Power's PLT (Power Line Transmission) data-over-power-lines trials in a Scottish town. The basis of the story was that because British Telecom couldn't provide broadband data links...Scottish Power could...using a system which could cause widespread problems for many broadcast radio users...let alone the unprotected (against interference) Amateur Radio service.

What angered many informed people when they saw the report of the PLT trials (see Letters pages this month) was that the BBC news reporters seemingly made no attempt to present a balanced report on the item. Indeed...I think they were the victims of a commercial promotion...to the delight of some anonymous Public Relations/Press Officer!

Although dismayed at the story...I found it reassuring to find out that the RSGB had reacted very quickly by E-mailing the BBC to warn them of the justified concerns of the Amateur Radio fraternity. What response the RSGB got I don't know...but the problem for anyone trying to redress the effects of a poorly reported news (especially a TV news item) story is hampered by the ephemeral nature of the medium.

It's a case of "Here today...gone tomorrow"! Unless it's one of those pot boilers we all know about. However, there's no excuse in today's complex world for journalists to be unable to

understand, explain or check the implications of new technology. These can easily be researched, and then broadcast. With the exception of specialist science programmes...I often feel that the average journalist and news editor's technical knowledge stops at the 13A mains plug stage!

The BBC carries a huge number of promotions

(Adverts?) for itself nowadays - and at times it seems as though we're watching a commercial break! One of those being broadcast at the moment is promoting the BBC's Annual Report. The presenter 'fronting' this promotion mentions the BBC's charter and mentions its 'educational' aspects. I think it's time that the BBC news editors follow their own charter...so that the listening and viewing public is 'educated and informed'...rather than by watching commercial spin presented as news.

Triumphed Over Adversity

I'd now like to pay tribute to someone who has triumphed over adversity. This is because occasionally over the years I've received letters (some of them couched in very unfriendly terms) discussing the difficulties of studying for the coveted Amateur Radio Examination and Licence.

Obviously, with the introduction of the old Novice Licence, then the Foundation Licence things have changed somewhat. Nowadays - in the UK at least - our hobby is available to enthusiasts with wide range of abilities...including some who would have had very great difficulty in passing the RAE. And in Topical Talk this month I'm featuring someone who - with much help and goodwill from his friends - achieved his goal.

So, please join me on the Topical Talk page...to share the pride I have in having Eamonn Kavanagh EI3FFB as a friend.

Rob G3XFD



● Television news has tremendous impact. But Rob G3XFD thinks that some BBC journalist's technical knowledge hasn't passed the 13A plug stage level...leading to unbalanced reporting.

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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.

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We have a selection of back issues, covering the past three years of PW. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for PW are £3.35 each (inc. P&P) and photocopies are £3.00 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1.50 P&P for one binder, £2.75 for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for PW/SWM is also available from the Editorial Offices for £2 inc. P&P.

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Technical Help

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

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



● **Dear Sir**

I soldered everything with a copper bit iron heated on the gas stove in 1968 when I was 13 years young. Nobody else at school was even remotely interested in radio. Imagine my great joy when I attached an earth to the water pipe and threw a wire around the kitchen with batteries connected and 2000Ω headphones and stations were heard.

I spent many years listening in the shed with an outdoor aerial until batteries, 90V from the chemist down the road, and valves became unobtainable, I remember hearing local Amateurs on 1.8MHz. These included **Cecil G6DV** and **Fred** (whose callsign I cannot remember) come to mind and thinking that "one day I want to do this".

The coils now form my wavemeter and the headphones I still use occasionally in my new (old) one valve set using a PM2DX valve with ten PP3s wired in series for high tension supply.

However, I feel I was robbed being charged £4.50 for the valve and base, when a *Wireless World* magazine from 1940 shows the valve priced at 4/9d. Surely I should have been charged about 23.5 pence?

Bill Kitchen G4GHB
Ashton-Under-Lyne
Lancashire

Editor's comment: Now that's inflation for you Bill! We'd also like to hear from anyone who still has an original working HAC receiver, so that we can feature it in an article appreciating the work of the kit company who launched many a radio enthusiast into the hobby.

Dabbling In Good Service!

● **Dear Sir**

I recently purchased a Pure Evoke 1 DAB portable radio and after three months the on/off switch failed. I telephoned the company directly and spoke with Customer Services.

From this point on, I was amazed and delighted with the courteous attention I received. I was given a returns number and asked to repackage the radio and await a UPS courier who would collect the parcel at a specific date and time. The UPS chap came at the correct date and time, checked my returns number was correct

and duly took the parcel away.

Two weeks later the radio was returned via UPS with a telephone call from Pure the day before to arrange a convenient time for delivery. To my surprise and delight a brand new radio was in the box. I should like to extend my thanks to Pure for this excellent service.

Doug Cormack G4VZR
Coaley
Gloucestershire

Editor's comment: Radio enthusiasts appreciate good service, and won't tolerate mediocre 'after sales' back up. It's also good to know that such

**service is available for
complex broadcast
receiving equipment.**

Mystery Wireless Memories

● **Dear Sir**

Many decades ago I knew a boy of about my own age and who was terminally ill. His parents bought him everything he wanted, but his prized possession was his 'wireless set'. This was, I think, made by Marconi and housed in a polished wood box about 8 inches square. Under the lid was a black (Ebonite?) panel on which were mounted the components comprising a crystal and cat's whisker, large tuning knob (operating a Variometer?) and terminals for aerial, earth and headphones. There was also a small push button.

In those far off days, London's 2LO did not transmit continuously and if, when the button was pressed a soft buzzing/humming could be heard coming from the box, it meant that transmission was taking place. No buzzing/humming = no transmission.

I was told that there was no battery inside the box. It would be interesting to know details of the circuit, with particular reference as to how sufficient power was generated to operate the sounder.

Charles W.E. Trippett
East Looe
Cornwall

Editor's puzzled reply:
That's an interesting one Charles! Bearing in mind that an un-modulated carrier would be well nigh impossible to hear on such receivers we've got to try something else. The first thing that comes to mind - and you can see these on some early crystal detector receiver - is that the receiver was fitted with a miniature buzzer/inductor spark unit for tuning purposes (tune

for maximum noise). However, as no batteries were used (unless it was a piezo-electric device) I'm at a loss to explain it. Any suggestions readers?

Razor Blades As Detectors

● **Dear Sir**

During the Second World War, the blue Gillette razor blades had on one side a + mark at the top right hand corner. Our radio technicians told us that this was the positive end of the diode. The cat's whisker searched the blue area on the same side.

Ordinary razor blades came wrapped in waxed paper. This could be used as the dielectric when packing blades alternatively in an 'L' configuration to make a capacitor.

In those days 2000Ω impedance headphone were standard. But a real prize was the earpiece off a wooden boxed wall mounted telephone - these being balanced armature - were really good and sensitive.

Being a linesman in those days, radio was a foreign language to me and the knowledge gained from such engineering was 'gobbledegook'. But since taking the RAE it all makes sense.

W. Carter G6WSX
Holmfirth
Yorkshire

Editor's comment: The polarity + mark on the razor blade is a new one to me...but it makes sense. Has G6WSX inadvertently mentioned one of the many little 'wheezes' thought up by those dedicated to helping Prisoners of War on their hazardous attempts to reach home? I've heard of small lumps Galena (lead sulphite, very popular as a semiconductor detector) being sent inside tins of dubbin (for waterproofing shoes and boots) in parcels. The dubbin had an

Angus Annan MM1CCR
Chair RSGB EMC
Committee
Stirling
Scotland

Editor's note: Thank you for your informative letter Angus. I fully support you in your efforts. Please see the Keylines Editorial for further comment.

E-mail & Snail Mail

● Dear Sir

Perhaps the Editor might like to explain why it takes so long to receive a reply when readers E-mail him? I use E-mail because I want a message to get through quickly...and its cheaper than a stamp! I appreciate that Rob G3XFD is obviously very busy but I was quite disappointed when I received - almost immediately - an 'Auto reply' saying he was busy...and then having to wait for three days before getting a reply.

Perhaps it might be quicker for me to write a letter to the Editor? I think not...it's just as likely there's an even longer queue of letters waiting to be answered. And although I had to wait to get a full reply from the Editor, I did at least get a reply within a few days which almost certainly wouldn't be the case if I sent airmail letter to the UK from Holland where I'm based at the moment! Finally I enjoy the magazine...and I'm pleased to confirm it's easy to buy wherever I go in Holland.

Colin Menzies
Utrecht
The Netherlands

E-mail Ignored?

● Dear Sir

Recently I E-mailed the Editor of *Practical Wireless* as I know from previous experience that **Rob G3XFD** - despite being busy - will almost invariably reply within a day or so. To my disappointment though this didn't happen and I had to send another two E-mails before Rob eventually replied.

My questions were then answered and I found the extra service provided by the

PW staff to be very helpful indeed. In fact, I soon received replies from other member of the Editorial department...together with one from the Subscription Department.

From what Rob told me in his reply there seems to be a problem with E-mails, so I'm hoping you might be able to publish my letter, enabling the many readers to help you with this important aspect of radio feedback!

Andrew Thompson
Raigmore
Inverness

Editor's long...(but necessary) reply: Thank you for your letters Colin and Andrew. I'm very pleased indeed that you've flagged up the E-mail problem in a way so I can reply and apologise publicly via the letters pages. Unfortunately, Andrews' original E-mails to me were just addressed with subject lines "Rob you might like to....." and I'm afraid the first two received were mistakenly 'trashed' as Spam. This happened because many Spam messages now come in with the recipient's name appearing first in the subject line, the fashion indicated. Normally I'm careful to open the E-mail briefly to check it is a genuine message, before acting accordingly. However, due to the number of E-mails received, I must have misjudged the contents and dumped them. Fortunately, Andrew then tried another technique...addressing his e-mails using the subject line..."Atten. Editor PW". Contact was then established! And although I apologise to anyone else whose E-mails have suffered a similar fate...I ask that wherever possible you please include *Practical Wireless*, Rob G3XFD, Editor *PW*, or something else to link it to us, within the first few words of the subject line. The Spammers will obviously cotton on to this technique eventually (The many pornographic and pharmaceutical offers,

etc, from Eastern Europe/Africa and the Indian Sub-Continent are already including 'Rob' in the subject line!). The other important requirement is to ensure you send your E-mail text within the mail, and not as an attachment. With these provisions I hope normal service will be resumed!

Bargain Basement Works!

● Dear Sir

One of the reasons for my letter is to comment about the Bargain Basement section in *PW*. I think it's the most effective reader service provided by the magazine and it adds to my enjoyment very much. I have been able to buy quite a few items through BB. Despite this I have to ask....just why are there so many rules, regulations and requests on the page...taking up so much space?

For a start - although I don't have a FAX machine I wonder why you discourage FAXes to the Bargain Basement section? Perhaps you could also mention - if you do reply to or publish my letter - why the question marks have to be used? I find it very odd to think that anyone sending in an advert wouldn't take care to provide a neat and tidily prepared form anyway!

In closing - another reason for writing - although I can't help with a replacement s.w.r. meter for his a.t.u., I would like to suggest that if the Editor didn't manage to find a Praktica camera body when he advertised in the Wanted section of BB - I have one sitting here when he next passes through Athlone on the way to County Mayo. It's not expensive either...all Rob has to do is to come in and share a pot or tea or some of the 'Black Stuff' he so enjoys when he's in Ireland.
Michael Duggan
County Westmeath
Ireland

Editor's thanks: A very kind offer Michael! I got my camera okay, although Donna G7TZB is still

searching for the Yashica camera manual. I also got plenty of s.w.r meters - thanks readers. (I've written to thank everyone for their help)..and Castle Communications who also donated one! I shall also enjoy the refreshments when I drive by next time. Unfortunately, the next trip to Mayo is by air...but I hope to be driving over in May next year. To answer your questions...The rules in BB have only come about because so many adverts come in poorly prepared, with badly written telephone numbers and prices. The ? marks are used as a last resort to show that we've not been able to interpret them. Even if we had the time to check with each advertiser - many are out at work during the day. We have to rely on the advertiser to be as clear and concise as possible. Some of the abbreviations used would impress a crossword compiler! Finally, we discourage the use of the FAX machine because most Bargain Basement advert forms are handwritten - and the scanning system on many FAX machines of a domestic quality make the handwriting even more illegible. The FAX basket also effectively bypasses the mail booking-in system too. You can help us by ensuring your advert is very clearly prepared, uses no ambiguous wording or abbreviations. We'll then do our best at this end.

Radio Basics Goes VHF!

● Dear Sir

Thank you for the September *PW* which - thanks to being a subscriber - I got nice and early. The main reason for writing to you though is to thank **Phil Cadman G4JCP** for the excellent little 70MHz receiver project he's prepared. Rob G3XFD gracefully directed the applause towards Phil to pay tribute to his time and trouble preparing and writing the column. I do so too.

Over the years since the

Radio Basics column started I have enjoyed it very much. I'm one of those constructors who despite being very keen...has never progressed very far and this is what led me to write to you.

I remember Rob writing as **GM3XFD** when he was living in Scotland during the 1980s, when he presented the original Getting Started...The Practical Way series. I found this very enjoyable as it was pitched just about at my level of constructional expertise and understanding. From that series when Rob became Editor of *PW* we eventually got Carrying On The Practical Way...prepared by the **Rev. George Dobbs G3RJV**.

Unfortunately though, all the various projects, circuits and ideas presented first by G3XFD and then by G3RJV haven't prepared this particular constructor for v.h.f. projects. I was really at a loss and not a little wary of venturing above 30MHz. So, although I don't want to be thought to be complaining dear Editor...don't you think you have thrown us in the deep end?

Don't get me wrong...I'll enjoy building the projects but I am concerned as to whether or not I'll ever get them to work. Everything I've built so far has worked on h.f. - eventually but I lack the confidence to say I'll be as successful on v.h.f. On the other hand, since I've retired from teaching English and Maths...(not Science!) I do have more time to build and experiment and I thank

Phil G4JCP, George G3RJV and the Editor for the projects.

**Trevor Evan Davies
Pembroke Dock
Pembrokeshire**

Editor's comment:
Thanks for your interesting letter Trevor, chosen for publication as it also reflects others readers' comment. Don't worry too much on the techniques involved...and please see the special information panel in this month's Radio Basics where we'll do our best to help you as much as possible.

The Disappearing Transmitters

Dear Sir

Thank you for the September *PW* which arrived in time for me to write and say a big 'Thank you' for paying tribute to the former BBC transmitter at Woofferton in Shropshire. Incidentally, I noticed you spelt it with one F rather than two. This got me looking at my own collection of maps which my late wife - whose family came from Ledbury in Herefordshire - and I collected for our cycling touring holidays immediately before, and after the Second World War.

On one of the Bartholomew's Cycle Touring maps I found that Woofferton was to be found spelt using both one F and two Fs on the same map! My own research has indicated that Woolston in Cheshire - where I was born - was once called Wulafstone,

and Wulfstane. Language and spelling are always evolving aren't they?

The main reason for writing though, is to ask for more articles such as that written by the Editor on Woofferton. These big short wave stations are fascinating indeed, especially to those like me who are in their late 80s. I remember cycling with my wife past Hilversum in Holland, and the Radio Luxembourg transmitter in the Grand Duchy on holidays before the war. It was quite something to see the famous names on the tuning dials of my wireless spring into life as we cycled by.

Nowadays I don't cycle - my arthritis doesn't allow that and my memory is failing too - so don't ask me to write an article Mr Editor...I'm too old! Instead though, perhaps you would consider telling us more, including information about the mysterious 'Aspidistra' transmitter which was buried underneath Ashdown Forest in Sussex?

Perhaps you could add the Aspidistra station to your list? I hope so as they've been part of our radio heritage for so long.

**Leonard W. Wilkinson
Stoke-on-Trent
Staffordshire**

Editor's comment: It will be our pleasure Leonard! I'm actually working on this idea at present. It's a relevant follow-on as equipment from Woofferton was 'borrowed' to be used in Aspidistra's special 'Black Broadcasting' service.

amateur radio rallies

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

September 14

The Anglian Five Essex Rally

Contact: Peter G8HUE
Tel: (01473) 631313

Website: www.suffolkdatagroup.freemove.co.uk
Sponsored by the Suffolk Data Group, the Suffolk Super September Rally & Surplus Sale is to be held at the Raceway Centre Green at Foxhall Stadium, near Ipswich, Suffolk. There will be Amateur Radio, computers, electronics, computer jumble and surplus equipment and on-site refreshments. Traders admission from 0800 - £5 car booters' admission from 0800 - £5. Visitors admissions from 0930 - £1. Everyone is welcome to attend.

* September 19/20

Leicester Amateur Radio Show & Convention

Contact: Geoff Dover G4AFJ
Tel: (01455) 823344

Website: <http://www.lars.org.uk>
The 32nd Leicester Amateur Radio Show & Convention is to be held at the Castle Donington International exhibition Centre, Donington Park, NW Leicestershire, less than five minutes from J23A & J24 M1 motorway. Doors open 0930 till 1730 Friday and 0930 till 1700 Saturday. There will be a flea market, Bring & Buy, large R5GB stand, local and national clubs and societies. Morse tests on demand and lots more Visit the web site for lots more information.

September 21

The Annual Blarney Rally

Contact: Con E17DJB, QTHR
Tel: 00 353-12 4270136 / 00 353-86 1071312

Website: www.blarneyrally.com
Held at the Blarney Park Hotel, Blarney, Co. Cork, Republic of Ireland. Organised by the Cork Radio Club the proceedings begin at 1100.

October 12

The Great Lumley Amateur Radio and Electronics Society's Rally

Contact: Nancy Bone
Tel: 0191-477 0036 (home) or (07990) 760920 (mobile)

E-mail: nancybone2001@yahoo.co.uk
Held at the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co. Durham. Doors open 1030. This is the biggest and best rally in the North East! There will be free parking, plus easy access, good, inexpensive food and drink. There will be a flying display by Chester-le-Street Model Aircraft Club with a stand. Bring & Buy in two sections, radio, hobbies, electronics, computer, satellite and component stalls. Admission is £2. Free of charge for under 14s if accompanied by adult.

October 19

The Blackwood & District Amateur Radio Society's Rally

Contact: D. Lewis GW6GW
Address: 23 Gelligroes Road, Pontllanfraith, Blackwood, Gwent NP12 2JU.

Held at the Newport Centre, Newport, one mile from Junction 25A of the M4 Junction 26 when travelling West to East. Doors open at 1045 (1030 for disabled visitors), admission is £1.50. There will be a free car park, Bring & Buy, Talk-in, trade stands, specialist interest groups, bar, catering, disabled facilities and a raffle.

November 2

The South Yorkshire Repeater Group's 13th Great Northern Hamfest

Contact: Ernie Bailey G4LUE
Tel: (01226) 716339 or mobile (07787) 546515

This rally is to be held at the Metrodome Leisure Complex, Queen Road, Barnsley, South Yorkshire. Doors open at 1000. The Leisure Complex is in the town centre, just five minutes walk from the train and bus stations - (follow the brown Metrodome signs from all directions). The venue is all on one level and has excellent disabled facilities. Features include all the usual trade stands, component and specialist interest groups with a large Bring & Buy. Admission is £2.50.

November 9

The Bishop Auckland Radio Amateurs Club (BARAC) 2003 Rally

Contact: Mark G0GFG or Brian G7OCK
Tel: (01388) 745353 or (01388) 762678

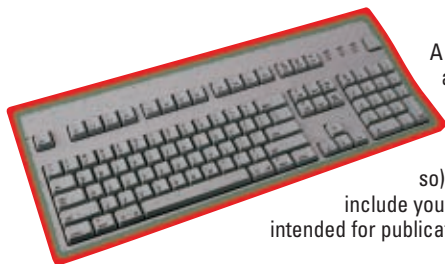
Takes place at Spennymoor Leisure Centre. This venue is ideally suited for both trader and disabled as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer and electronics, plus a Bring & Buy stall as well as catering and bar facilities. Morse tests will be available on demand. Doors open 1100 (1030 for disabled visitors) and admission is just £1, under 14s free of charge with adult. Talk-in on S22.

At rallies marked with * look out for a representative from PW Publishing Ltd. at this rally. Go along to the stand for great deals on subscriptions to *Practical Wireless*, *Radio Active* and *Short Wave Magazine*, clearance books and a selection of back issues.

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.

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

Letters Received Via E-mail



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


www.amateurantennas.com

TEL: (01908) 281705. FAX: (01908) 281706

LOG PERIODIC

MLP32 TX & RX 100-1300MHz one feed, S.W.R. 2:1 and below over whole frequency range professional quality (length 1420mm).....**£99.95**
MLP62 same spec as MLP32 but with increased freq. range 50-1300 Length 2000mm.....**£169.95**

MOBILE HF WHIPS (with 3/8 base fitting)

AMPRO 6 mt.....**£16.95**
 (Length 4.6' approx)
AMPRO 10 mt.....**£16.95**
 (Length 7' approx)
AMPRO 12 mt.....**£16.95**
 (Length 7' approx)
AMPRO 15 mt.....**£16.95**
 (Length 7' approx)
AMPRO 17 mt.....**£16.95**
 (Length 7' approx)
AMPRO 20 mt.....**£16.95**
 (Length 7' approx)
AMPRO 30 mt.....**£16.95**
 (Length 7' approx)
AMPRO 40 mt.....**£16.95**
 (Length 7' approx)
AMPRO 80 mt.....**£19.95**
 (Length 7' approx)
AMPRO 160 mt.....**£49.95**
 (Length 7' approx)
AMPRO MB5 Multi band 10/15/20/40/80 can use 4 Bands at one time (Length 100").....**£69.95**

VHF/UHF MOBILE ANTENNAS

MICRO MAG 2 Metre 70 cms Super Strong 1" Mag Mount (Length 22").....**£14.95**
MR700 2m/70cms, 1/4 wave & 5/8, Gain 2m 0dB/3.0dB 70cms Length 20" 3/8 Fitting.....**£7.95**
SO239 Fitting.....**£9.95**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (3/8 fitting).....**£16.95**
 (SO239 fitting).....**£18.95**
MRO525 2m/70cms, 1/4 wave & 5/8, Gain 2m 0.5dB/3.2dB 70cms Length 17".....**£19.95**
 SO239 fitting commercial quality.....**£19.95**
MRO500 2m/70cms, 1/2 wave & 2x5/8, Gain 2m 3.2dB/5.8dB 70cms Length 38" SO239 fitting commercial quality.....**£24.95**
MRQ750 2m/70cms, 6/8 wave & 3x5/8, Gain 2m 5.5dB/8.0dB 70cms Length 60" SO239 fitting commercial quality.....**£39.95**
MRQ800 6/2/70cms 1/4 6/8 & 3 x 5/8, Gain 6m3.0dB/2m 5.0dB/70 7.5dB Length 60" SO239 fitting commercial quality.....**£39.95**
GF151 New low price.....**£29.95**

SINGLE BAND MOBILE ANTENNAS

MR 214 2 Metre 1/4 wave (3/8 fitting).....**£3.95**
 (SO239 fitting).....**£5.00**
MR260S 2 Metre 1/2 wave 2.5 dBd gain Length 43" SO239 fitting.....**£24.95**
MR 258 2 Metre 5/8 wave 3.2 dBd Gain (3/8 fitting) (Length 58").....**£12.95**
MR 650 2 Metre 5/8 wave open coil (3.2 dBd Gain) (Length 52") (3/8 fitting).....**£9.95**
MR268S 2 Metre 5/8 wave 3.5dBd gain Length 51" SO239 fitting.....**£19.95**
MR280S 2 Metre 6/8 wave 5.8dBd gain Length 58" SO239 fitting.....**£29.95**
MR 614 6 Metre loaded 1/4 wave (Length 56") (3/8 fitting).....**£13.95**
MR 644 6 Metre loaded 1/4 wave (Length 40") (3/8 fitting).....**£12.95**
 (SO239 fitting).....**£15.95**

SINGLE BAND END FED BASE ANTENNAS

70 cms 1/2 wave, length 26", gain 3.5dB.....**£24.95**
2 metre 1/2 wave, length 52", gain 3.5dB.....**£24.95**
4 metre 1/2 wave, length 80", gain 3.5dB.....**£34.95**
6 metre 1/2 wave, length 120", gain 3.5dB.....**£44.95**
6 metre 3/4 wave, length 150", gain 5.5dB.....**£49.95**
 (All above end fed antennas are DC grounded, so are radial free!)

VHF/UHF VERTICAL CO-LINEAR FIBREGLASS BASE ANTENNA

SQ & BM Range VX 6 Co-linear - Specially Designed Tubular Vertical Coils individually tuned to within 0.05pf (maximum power 100 watts)
BM100 Dual-Bander.....**£29.95**
 (2 mts 3dBd) (70cms 6dBd) (Length 39")
SQBM100 Dual-Bander.....**£39.95**
 (2 mts 3dBd) (70cms 6dBd) (Length 39")
BM200 Dual-Bander.....**£39.95**
 (2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
SQBM200 Dual-Bander.....**£49.95**
 (2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
SQBM500 Dual - Bander Super Gainer.....**£59.95**
 (2 mts 6.8dBd) (70cms 9.2dBd) (Length 100")
SQBM800 Dual - Bander Ultra Gainer.....**£129.95**
 (2 mts 8.5dBd) (70cms 12.5dBd) (Length 200")
BM1000 Tri-Bander.....**£59.95**
 (2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
SQBM1000 Tri-Bander.....**£69.95**
 (2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
SQBM 100/200/500/800/1000 are Polycoated Fibre Glass with Chrome & Stainless Steel Fittings.

SINGLE BAND VERTICAL CO-LINEAR BASE ANTENNA

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

MINI HF DIPOLES (length 11' approx)

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

ROTATIVE HF DIPOLE

RDP-3B 10/15/20mtrs length 7.40m.....**£99.95**
RDP-40M 40mtrs length 11.20m.....**£139.95**
RDP-6B 10/12/15/17/20/30mtrs boom length 1.00m. Length 10.0m.....**£199.95**

HF DELTA LOOPS

DLHF-100 10/15/20mtrs (12/17-30m) Boom length 4.2m. Max height 6.8m. Weight 35kg. Gain 10dB.....**£399.95**

HAND-HELD ANTENNAS

MRW-300 Rubber Duck TX 2 Metre & 70 cms RX 25-1800 Mhz Length 21cm BNC fitting.....**£12.95**
MRW-310 Rubber DuckTX 2 Metre & 70 cms Super Gainer RX 25-1800 Length 40cm BNC fitting.....**£14.95**
MRW-232 Mini Miracle TX 2 Metre 70 & 23 cms RX 25-1800 Mhz Length just 4.5cm BNC fitting.....**£19.95**
MRW-250 Telescopic TX 2 Metre & 70 cms RX 25-1800 Mhz Length 14-41cm BNC fitting.....**£16.95**
MRW-200 Flexi TX 2 Metre & 70cms RX 25-1800 Mhz Length 21cm SMA fitting.....**£19.95**
MRW-210 Flexi TX 2 Metre & 70cms Super Gainer RX 25-1800 Mhz Length 37cm SMA fitting.....**£22.95**

All of the above are suitable to any transceiver or scanner.
 Please add £2.00 p+p for hand-held antennas.

HB9CV 2 ELEMENT BEAM 3.5 dBd

70cms (Boom 12").....**£15.95**
2 metre (Boom 20").....**£19.95**
4 metre (Boom 23").....**£27.95**
6 metre (Boom 33").....**£34.95**
10 metre (Boom 52").....**£64.95**
6/2/70 Triband (Boom 45").....**£64.95**

CROSSED YAGI BEAMS All fittings Stainless Steel

2 metre 5 Element (Boom 64") (Gain 7.5dBd).....**£74.95**
2 metre 8 Element (Boom 126") (Gain 11.5dBd).....**£94.95**
70 cms 13 Element (Boom 83") (Gain 12.5dBd).....**£74.95**

YAGI BEAMS All fittings Stainless Steel

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

ZL SPECIAL YAGI BEAMS ALL FITTINGS STAINLESS STEEL

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

MULTI PURPOSE ANTENNAS

MSS-1 Freq RX 25-2000 Mhz, TX 2 mtr 2.5 dBd Gain, TX 70cms 4.0 dBd Gain, Length 39".....**£39.95**
MSS-2 Freq RX 25-2000 Mhz, TX 2 mtr 4.0 dBd Gain, TX 70cms 6.0 dBd Gain, Length 62".....**£49.95**
IVX-2000 Freq RX 25-2000 Mhz, TX 6 mtr 2.0 dBd Gain, 2 mtr 4dBd Gain, 70cms 6dBd Gain, Length 100".....**£89.95**
 Above antennas are suitable for transceivers only

HALO LOOPS

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

G5RV Wire Antenna (10-40/80 metre)

All fittings Stainless Steel

	FULL	HALF
Standard	£22.95	£19.95
Hard Drawn	£24.95	£22.95
Flex Weave	£32.95	£27.95
PVC Coated		
Flex Weave	£37.95	£32.95
Deluxe 450 ohm PVC Flexweave	£49.95	£44.95

TS1 Stainless Steel Tension Springs (pair) for G5RV.....**£19.95**

G5RV INDUCTORS

Convert your half size g5rv into a full size with just 8ft either side. Ideal for the small garden.....**£19.95**

SHORT WAVE RECEIVING ANTENNA

MD37 SKY WIRE (Receives 0-40Mhz).....**£39.95**
 Complete with 25 mts of enamelled wire, insulator and choke Balun Matches any long wire to 50 Ohms. All mode no A.T.U. required. 2 "S" points greater than other Baluns.

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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)	£11. ⁹⁵
18" T & K Bracket (complete with U Bolts)	£17. ⁹⁵
24" T & K Bracket (complete with U Bolts)	£19. ⁹⁵
36" T & K Bracket (complete with U Bolts)	£29. ⁹⁵
Chimney lashing kit	£12. ⁹⁵
Double chimney lashing kit	£24. ⁹⁵
3-Way Pole Spider for Guy Rope/ wire	£3. ⁹⁵
4-Way Pole Spider for Guy Rope/ wire	£4. ⁹⁵
1.5" Mast Sleeve/Joiner	£8. ⁹⁵
2" Mast Sleeve/Joiner	£9. ⁹⁵
Earth rod including clamp (copper plated)	£8. ⁹⁵
Earth rod including clamp (solid copper)	£14. ⁹⁵
Pole to pole clamp 2"-1.5"	£4. ⁹⁵
Di-pole centre (for wire)	£4. ⁹⁵
Di-pole centre (for aluminium rod)	£4. ⁹⁵
Dog bone insulator	£1. ⁰⁰
Dog bone insulator heavy duty	£2. ⁰⁰

5ft POLES H/DUTY (SWAGED)

Heavy Duty Ali (1.2mm wall)	
1 1/4" single 5' ali pole	£7. ⁰⁰
1 1/4" set of four (20' total approx)	£24. ⁹⁵
1 1/2" single 5' ali pole	£10. ⁰⁰
1 1/2" set of four (20' total approx)	£34. ⁹⁵
1 3/4" single 5' ali pole	£12. ⁰⁰
1 3/4" single 5' ali pole (20' total approx)	£39. ⁹⁵
2" single 5' ali pole	£15. ⁰⁰
2" set of four (20' total approx)	£49. ⁹⁵

(All swaged poles have a push fit to give a very strong mast set)

**REINFORCED HARDENED FIBRE
GLASS MASTS (GRP)**

112" Diameter 2 metres long	£16. ⁰⁰
134" Diameter 2 metres long	£20. ⁰⁰
2" Diameter 2 metres long	£24. ⁰⁰

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

CABLE & COAX CABLE

RG58 best quality standard per mt	35p
RG58 best quality military spec per mt	60p
Mini 8 best quality military spec best quality per mt	70p
RG213 best quality military spec per mt	85p
H200 best quality military coax cable per mt	£1. ¹⁰
3-core rotator cable per mt	45p
7-core rotator cable per mt	£1. ⁰⁰

PHONE FOR 100 METRE DISCOUNT PRICE.

CONNECTORS & ADAPTERS

PL259/9	£0. ⁷⁵ each
PL259/6	£0. ⁷⁵ each
PL259/7 for mini 8	£1. ⁵⁰ each
BNC (Screw Type)	£1. ⁵⁰ each
BNC (Solder Type)	£1. ⁵⁰ each
BNC for 9mm (RG213)	£2. ⁵⁰
N TYPE for RG58	£2. ⁵⁰ each
N TYPE for RG213	£2. ⁵⁰ each
SO239 to BNC	£1. ⁵⁰ each
PL259 to BNC	£2. ⁵⁰ each
N TYPE to SO239	£3. ⁵⁰ each
BNC to N-type	£2. ⁵⁰
SMA to BNC	£3. ⁹⁵
SMA to SO239	£3. ⁹⁵
SMA to PL259	£3. ⁹⁵
SMA to BNC (male)	£3. ⁹⁵
SO239 chassis socket round	£1. ⁰⁰
N-type chassis socket round	£2. ⁵⁰
SO239 double female	£1. ⁰⁰
N-type double female	£2. ⁵⁰
SO239 double female	£1. ⁰⁰

10/11 METRE ANTENNAS

G.A.P.12 1/2 wave aluminium (length 18' approx)	£24. ⁹⁵
G.A.P.58 5/8 wave aluminium (length 21' approx)	£29. ⁹⁵
S27-3 3-element yagi. Freq: 27-28MHz. Length: 2.5mtrs. Gain: 8.5dB	£59. ⁹⁵
S27-4 4-element yagi. Freq: 27-28MHz. Length: 3.8mtrs. Gain: 10.5dB	£69. ⁹⁵

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

TRI/DUPLEXER & ANTENNA SWITCHES

MD-24 HF or VHF/UHF internal duplexer (1.3-225MHz) (350-540MHz) SO239/PL259 fittings	£22. ⁹⁵
MD-24N same spec as MD-24 but "N-type" fittings	£24. ⁹⁵
MD-25 HF or VHF/UHF internal/external duplexer (1.3-225MHz) (350-540MHz) SO239 fittings	£24. ⁹⁵
MX2000 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz)	£49. ⁹⁵
CS201 Two-way di-cast antenna switch. Freq: 0-1000MHz max 2,500 watts SO239 fittings	£18. ⁹⁵
CS201-N Same spec as CS201 but with N-type fittings	£28. ⁹⁵
CS401 Same spec as CS201 but 4-way	£49. ⁹⁵

ANTENNA ROTATORS

AR-31050 Very light duty TV/UHF	£24. ⁹⁵
AR-300XL Light duty UHF/VHF	£49. ⁹⁵
YS-130 Medium duty VHF	£79. ⁹⁵
RC5-1 Heavy duty HF	£349. ⁹⁵
RG5-3 Heavy Duty HF Inc Pre Set Control Box	£449. ⁹⁵
AR26 Alignment Bearing for the AR300XL	£18. ⁹⁵
RC26 Alignment Bearing for RC5-1/3	£49. ⁹⁵

MOBILE MOUNTS

Turbo mag mount 7" 4mtrs coax/PL259 3/8 or SO239	£14. ⁹⁵
Tri-mag mount 3 x 5" 4mtrs coax/PL259 3/8 or SO239	£39. ⁹⁵
Hatch Back Mount (stainless steel) 4 mtrs coax/PL259 3/8 or SO239 fully adjustable with turn knob	£29. ⁹⁵
Gutter Mount (same as above)	£29. ⁹⁵
Rail Mount (aluminium) 4mtrs coax/PL259 suitable for up to lynch roof bars or poles 3/8 fitting	£12. ⁹⁵
SO259 fitting	£14. ⁹⁵
Gutter Mount (cast aluminium) 4mtrs coax/PL259 3/8 fitting	£9. ⁹⁵
SO259 fitting	£12. ⁹⁵
Hatch Back Mount 3/8 4mtrs coax/PL259	£12. ⁹⁵
Roof stud Mount 4mtrs coax/PL259 3/8 or SO239 fitting	£12. ⁹⁵

ANTENNA WIRE & RIBBON

Enamelled copper wire 16 gauge (50mtrs)	£9. ⁹⁵
Hard Drawn copper wire 16 gauge (50mtrs)	£12. ⁹⁵
Equipment wire Multi Stranded (50mtrs)	£9. ⁹⁵
Flexweave high quality (50mtrs)	£27. ⁹⁵
PVC Coated Flexweave high quality (50mtrs)	£37. ⁹⁵
300Ω Ladder Ribbon heavy duty USA imported (20mtrs)	£15. ⁰⁰
450Ω Ladder Ribbon heavy duty USA imported (20mtrs)	£15. ⁰⁰

(Other lengths available, please phone for details)

HF BALCONY ANTENNA

BAHF-4 FREQ: 10-15-20-40 Mtrs LENGTH: 1.70m HEIGHT: 1.20m POWER: 300 Watts	£129. ⁹⁵
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**MISCELLANEOUS ITEMS**

CDX Lightning arrestor 500 watts	£19. ⁹⁵
MDX Lightning 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 options)

TMA3 3" to 1 1/4" heavy duty aluminium telescopic mast set, approx 40ft when erect, 6ft collapsed	£199. ⁹⁵
TMA2 2 1/4" to 1 1/4" heavy duty telescopic mast set, approx 40ft when erect, 9ft collapsed	£149. ⁹⁵
TMA1 2" to 1 1/4" heavy duty aluminium telescopic mast set, approx 20ft when erect, 6ft collapsed	£99. ⁹⁵
TMAF-1 2" to 1 1/4" heavy duty fibreglass telescopic mast set, approx 20ft when erect, 6ft collapsed	£99. ⁹⁵
TMAF-2 2 1/4" to 1 1/4" heavy duty telescopic fibreglass mast set, approx 40ft when 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	£329. ⁹⁵
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**ADEX-3300 3 BAND 3 ELEMENT TRAPPED
BEAM**

FREQ: 10-15-20 Mtrs GAIN: 8 dBd BOOM: 4.42m LONGEST ELE: 8.46m POWER: 2000 Watts	£269. ⁹⁵
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**ADEX-6400 6 BAND 4 ELEMENT TRAPPED**

BEAM FREQ: 10-12-15-17-20-30 Mtrs GAIN: 7.5 dBd BOOM: 4.27m LONGEST ELE: 10.00m POWER: 2000 Watts	£499. ⁹⁵
40 Mtr RADIAL KIT FOR ABOVE	£99. ⁰⁰

**HF VERTICALS****VR3000 3 BAND VERTICAL**

FREQ: 10-15-20 Mtrs GAIN: 3.8 dBd HEIGHT: 3.80m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials)	£89. ⁹⁵
OPTIONAL 10-15-20mtr radial kit	£34. ⁹⁵

**VR5000 5 BAND VERTICAL FREQ: 10-15-20-40-80 Mtrs**

GAIN: 3.5 dBd HEIGHT: 4.00m RADIAL LENGTH: 2.30m (included). POWER: 500 Watts	£169. ⁹⁵
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**EVX4000 4 BAND VERTICAL FREQ: 10-15-20-40 Mtrs**

GAIN: 3.5 dBd HEIGHT: 6.50m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials)	£99. ⁹⁵
OPTIONAL 10-15-20mtr radial kit	£34. ⁹⁵
OPTIONAL 40mtr radial kit	£12. ⁹⁵

**EVX5000 5 BAND VERTICAL FREQ: 10-15-20-40-80**

Mtrs GAIN: 3.5 dBd HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials)	£139. ⁹⁵
OPTIONAL 10-15-20mtr radial kit	£34. ⁹⁵
OPTIONAL 40mtr radial kit	£12. ⁹⁵
OPTIONAL 80mtr radial kit	£14. ⁹⁵

**EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-**

80 Mtrs HEIGHT: 5.00m RADIAL LENGTH: 1.70m (included) POWER: 800 Watts	£249. ⁹⁵
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**EVX8000 8 BAND VERTICAL FREQ: 10-12-15-17-20-**

30-40 Mtrs (80m optional) HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included) POWER: 2000 Watts	£269. ⁹⁵
80 MTR RADIAL KIT FOR ABOVE	£79. 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)

UTD160 FREQ: 160 Mtrs LENGTH: 28m POWER: 1000 Watts	£44. ⁹⁵
MTD-1 (3 BAND) FREQ: 10-15-20 Mtrs LENGTH: 7.40 Mtrs POWER: 1000 Watts	£39. ⁹⁵
MTD-2 (2 BAND) FREQ: 40-80 Mtrs LENGTH: 20Mtrs POWER: 1000 Watts	£44. ⁹⁵
MTD-3 (3 BAND) FREQ: 40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts	£89. ⁹⁵
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts	£44. ⁹⁵
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER: 1000 Watts	£79. ⁹⁵

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

PATCH LEADS**STANDARD LEADS**

1mtr RG58 PL259 to PL259 lead	£3. ⁹⁵
10mtr RG58 PL259 to PL259 lead	£7. ⁹⁵
30mtr RG58 PL259 to PL259 lead	£14. ⁹⁵

MILITARY SPECIFICATION LEADS

1mtr RG58 Mil spec PL259 to PL259 lead	£4. ⁹⁵
10mtr RG58 Mil spec PL259 to PL259 lead	£10. ⁹⁵
30mtr RG58 Mil spec PL259 to PL259 lead	£24. ⁹⁵
1mtr RG213 Mil spec PL259 to PL259 lead	£4. ⁹⁵
10mtr RG213 Mil spec PL259 to PL259 lead	£14. ⁹⁵
30mtr RG213 Mil spec PL259 to PL259 lead	£29. ⁹⁵

(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

COAX SWITCH SALE

CS201 Two-way 3 X SO239 £18.95this month just	£12. ⁹⁹
CS201N Two-way 3 X N-type £28.95this month just	£18. ⁹⁹
CS401 Four-way 5 X SO239 £49.95this month just	£39. ⁹⁹

Plus £6.00 P&P



● Special Event Station

Cadets on Air!

The equipment for GB4ATC was loaned by Kenwood Electronics and operated on Air Cadet frequencies as well as the Amateur bands. **Dave Green G8BCQ** managed the Station and he was assisted by Cadet Corporal **Jerry Antimano 2E1JOD**.

For the first time RIAT opened its doors on the Friday to allow over 20,000 young people to attend. These were mainly Air Cadets from as far afield as Dundee in Tayside, Scotland.

HRH the **Duke of Edinburgh** visited the Stand on the Sunday and was very interested in what the Cadets were doing. Not only is Prince Philip the Air Commodore-in-Chief of the Air Training Corps, but also the Patron of the **Radio Society of Great Britain**.

☐ Show Time!

Leicester 2003!

It's that time of year again, the Leicester Amateur Radio Show & Convention takes place 19-20th September and PW Publishing Ltd., will be there! So come along and see us....

Practical Wireless, *Radio Active* and *Short Wave Magazine* will be represented at the 32nd Leicester show taking place at Castle Donington, International Exhibition Centre, Donington Park, Leicestershire on Friday 19 and Saturday 20th September. There will be an array of offers available, including:

- Subscriptions - 3 years for the price of 2
- Clearance books - lots of bargains
- Back issues - complete your collection
- *Ferrells Confidential Frequency List* - New 13th Edition

So, make sure you 'stop off' at the PWP stand and pick-up a bargain or two!
We look forward to seeing you there.....

● Astro contacts!

Space School

*Astronaut Edward Lu KC5WKJ
talks to schools in Space
Station contacts.*

Recently **Edward Lu KC5WKJ** made contact with two schools in the UK using the International Space Station (ISS) callsign **NA1SS**. The first of the contacts took place on 6 August when pupils of **Neston Primary School** in Wiltshire asked 20 questions in the 10 minutes the ISS was above the horizon.

Charles Riley G4JQX (a parent of one of the children at Neston Primary School) participated in the event and held the contact as the children asked their questions in front of an audience of over 200. There were also dozens of reporters and camera crews present.

Two days later on 8 August, 13 students aged 11 to 13 from Soar Valley College in Leicester had



the opportunity to ask Edward KC5WKJ their questions. **Derek Hatton G4GWI**, a teacher at Soar Valley College, organised the contact using the school's club callsign, **M0SVC**. Ed gave some quite detailed answers, much appreciated by the assembled audience of students, parents and teachers.

Howard Long G6LVB, who is AMSAT-UK's ARISS delegate has provided pictures, audio and video on his website
<http://www.g6lvb.com/neston> and at
<http://www.g6lvb.com/svc>

☒ Radio New Zealand

All Day On Air

Radio New Zealand International is on air for 24 hours a day from 1 September 2003.

A new extended news and current affairs service means that Radio New Zealand is now on air for 24 hours a day. A new daily regional current affairs programme called *Dateline Pacific* will be broadcast at 0800UTC [2000 NZST] Monday to Friday.

Dateline Pacific will provide a daily round-up of the very latest news from the Pacific with interviews and features with all the region's

based in the region. An updated version of the programme will run in RNZI's *Pacific Breakfast Show* and it will also be rebroadcast at different times to give audiences around the Pacific in different times zones a chance to listen in. You will also be able to download Dateline Pacific from www.rnzi.com

The Bulletin service is also being extended with extra hourly Pacific News at 0100, 1100, 1300, and 1500UTC. During the extended broadcasting hours, RNZI will run a mix of RNZI-originated material and the best of New Zealand's National Radio.

Radio New Zealand International
PO Box 123, Wellington, New Zealand
Tel: (64 4) 4741 437. FAX: (64 4) 4741 433
E-mail: info@rnzi.com. Website: www.rnzi.com



On The Spot

A snippet of news from Danish shores.

Denmark has recently been allocated three spot frequencies on the 70MHz band (seems to be 70.025, 70.050 and 70.100MHz, 25W maximum). Derek G8TOK has reported that that **553X** worked **OY9JD** in the Faeroe Islands on 70MHz recently, so the permission extends to Danish overseas territories... presumably including Greenland. On the 21 July last, **John Desmond E17GL** worked **OZ3ZW** for the first Irish contact to OZ with a OSO on the 70MHz band.

● Listen At Leisure

On the Web

Did you know you can now receive programmes from Voice of America on the Internet?

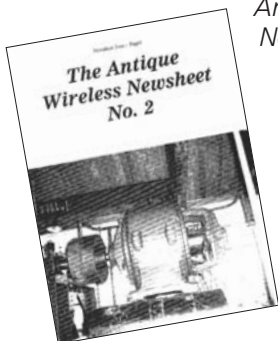
Voice of America programmes are now available on the Internet or as downloads via FTP or MP3 to your computer or as read text versions. If you have *RealAudio* and *RealVideo* on your computer you can also click on the programme you want. You can also download programmes via FTP or MP3 by clicking the buttons on each language page and then listen to the programmes at your leisure. Check out the website to find out more....

Voice of America
330 Independence Ave,
SW Washington,
DC 20237
USA
Website: www.voa.gov

Subscribe Now!

Antique Wireless

If you're interested in the antique and vintage wireless side of the Amateur Radio hobby why not subscribe to the Antique Wireless Newsheet?



section for for subscribers to place their own adverts.

The Newsheet is available on subscription - £5 for 12 issues (UK) residents, £7 (EU). To order a subscription write to **White Town Vintage, 50 Meddon Street, Bideford EX39 2EQ**. Tel: (01237) 424280.

Vann Draper at Leicester!

For the first time in several years Vann Draper Electronics Ltd., the test and measurement specialists will be exhibiting at the Leicester Amateur Radio and Convention

The team from Vann Draper Electronics will be displaying a wide range of test and measurement instruments including multimeters, signal generators and power supplies on their stand at the Leicestershire Amateur Radio Show & Convention on the 19 & 20th September at the Donington Exhibition Centre. Of particular interest will be the recently introduced low cost range of digimess oscilloscopes starting at just £99.

In addition to the test instruments on show will be the full range of soldering stations and accessories, as well as numerous other products of special interest to the electronics enthusiast. Visit the stand for special 'on the day' prices and stock clearance bargains.

Tim Coates

Vann Draper Electronics Ltd
Stenson House, Stenson, Derby
DE73 1HL

Tel: (01283) 704706

FAX: (01283) 704707

E-mail : sales@vanndraper.co.uk

Website: www.vanndraper.co.uk

☐ Digital Radio

New from Bush

Radio listening and enjoyment needn't be restricted to the shack, office or lounge! If so, why not experience Digital Audio Broadcasting in the kitchen with the latest Rush Radio?

The TR203DAB is the latest kitchen portable radio to come from the Bush 'stables' Features include:

- DAB stereo digital radio and a PLL f.m. analogue tuner
- Two line l.c.d. dot matrix DAB and PLL integrated display
- 20 analogue memories
- 10 DAB pre-set 'favourites'
- DAB autotune for a full list of available DAB stations.
- Stereo speakers providing 2W RMS output.



Available from all good high street retailers the TR2003DAB costs around £99.

More Morse News

Germany Drops Morse

Germany is the latest country to announce that it's abandoning the Morse code test

Following Switzerland, the UK, and Belgium... Germany is the latest country to announce that the Morse code test will no longer be a requirement for Amateur Radio operation on the h.f. bands.

The German **National Amateur Radio Society, DARC**, has announced via its Website that with effect from the 15 August Radio Amateurs in Germany with a CEPT Class 2 licence will be allowed to use the h.f. bands using their existing callsigns. At the time of going to press that was the information the Newsdesk had, so watch this space for further updates and developments.

Two new world records were set on Monday 11 August when a model aircraft landed in Mannin Beach, Clifden, County Galway after taking off from St. John's Newfoundland.

to fly a model plane from New Foundland to County Galway in early 2002 when retired NASA engineer **Maynard Hill** contacted them for help. Following the unsuccessful attempt in 2002 the second attempt was made in August 2003.

The model plane called *The Spirit of Butt's Farm* left Cape Spear on Saturday 9 August and landed 38.75 hours later having travelled 1888 miles. The ultra light 11lb model plane equipped with a 10cc engine completed the flight using just under **one gallon of**

fuel. The plane had a built in GPS controlled transmitter which bounced messages off a constellation of satellites in order to keep the team up to-date with the progress.

The plane was contacted using on-site antennas set up by the GRC and information such as speed, height, and distance were passed on to the pilot **Dave Brown**. Using this information Dave landed the plane within 35 feet of the designated landing spot.

The plane began to transmit encrypted messages within 25 miles of the Irish coast. Using a directional antenna connected to a Laptop, this

information was then decoded and passed on. Once the plane landed, its position was recorded using GPS, it was then weighed and the remaining fuel was extracted.

Following the flight Maynard submitted two records to the FAI. One record for distance by a

model plane and the other for duration of flight. These achievements will become World Records when the FAI obtains suitable evidence. Everyone in *PW* congratulates Maynard and his team for a fascinating effort!



RAE News

If you are looking for somewhere to take the RAE exam and live in County Durham look no further....

The Bishop Auckland Radio Amateur Club would like to remind *PW* readers that they are an approved Examination centre for the RAE. The club meet every Thursday in the Stanley Village Hall, Stanley, Crook at 2000hours. If you would like to enrol for the December exam please contact **Mr T. Bevan** the course tutor on **(01388) 745353** or **Mr M Hill G0GFG** on **(01388) 745353**.

Product News

A new hand-held transceiver has been launched by Kenwood UK Ltd., look out for it on your local radio dealer's shelves soon!

The new TH-K2E hand-held 144MHz f.m. transceiver is available either with or without a keypad. The keypad version being called the TH-K2ET. Features of the TH-K2E include:

- 100 memory channels
- 144-146MHz
- 50Ω Antenna Impedance
- Double superheterodyne
- 400mW Audio output

At the time of going to press no pricing information was available for the TH-K2E but keep an eye on these pages for updates. The K2E (non keypad version) will be reviewed in *PW* very soon.

Kenwood Electronics UK Ltd
Tel: (01923) 655284
E-mail: comms@kenwood-electronics.co.uk



amateur radio **clubs**

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

AVON

South Bristol ARC

Contact: Len Baker
Tel: (01275) 834282
Website: www.sbarc.co.uk

South Bristol Amateur Radio Club meet at Whitchurch Folkhouse, Bridge Farm House, East Dundry Road, Whitchurch, Bristol every Wednesday at 1930 hours. Forthcoming events include: **Sept 17:** Collecting Vintage Cameras by **Mr Frank Burns**; **24th:** On-Air evening; **Oct 1:** Computer Clinic with **Len G4RZY**. So why not go along and join in?

ESSEX

Braintree & District ARS

Contact: John M5AJB
Tel: (01787) 460947
Website: www.badars.org.uk

The Braintree & District Amateur Radio Society meet on the 1st & 3rd Monday of the month at The Clubhouse Braintree Hockey Club, Church Street, Bocking, Essex. Meetings start at 2000hours with doors opening at 1930hours, meetings usually finish by 2200hours. They run a varied programme so why not go along to one of these? **Oct 6:** Planning for JOTA and **20th:** ATU Clinic

Chelmsford Amateur Radio Society

Contact: David Bradley M0BQC
Tel: (01245) 602838
E-mail: info@g0mwt.org.uk
Website: www.g0mwt.org.uk

Steve Telenius-Lowe **G4JVG** Editor of *RadCom* will be giving a talk to the Chelmsford Amateur Radio Society on Tuesday 4 November. Steve recently introduced significant changes to *RadCom* which caused much discussion amongst Amateurs, so this talk will be well worth attending. The club meet in the Marconi Social Club, Beehive Lane, Great Baddow. The doors open at 1915hours and a bar is available for refreshments. Visitors are most welcome.



GREATER LONDON

Southgate ARC

Contact: Nick Earl
Tel: (01992) 443644

The Southgate Amateur Radio Club meets twice a month on the second and fourth Thursday at Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill London N21 3ER. Meetings commence at 1930hours. The Second Thursday meeting takes the form of a guest speaker and the fourth Thursday meetings are fairly informal. Why not go along, new members and visitors are always welcome and members currently range from youngsters to senior citizens.



GREATER MANCHESTER

**GREATER MANCHESTER
Stockport Radio Society**

Contact: David Simcock M1ANT
Tel: 01610456 7832
E-mail: m1ant@chrrissimcock.com
Website: www.stockportradiosociety.co.uk

Stockport Radio Society welcomes new members and would like to see you at their meetings which are held on the 1st & 3rd Tuesdays of the month at Bramhall Air Scouts HQ, Leewood Hall, Benja Fold, Bramhall, Stockport SK7 2BX. All meetings start at 1945 hours.



Keep those details coming in! ●

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CUSHCRAFT ANTENNA

MA5V	New vertical 10, 12, 15, 17, 20m	£229.95	£215.00
MA5B	Mini beam 10, 12, 15, 17, 20m	£249.95	£299.95
A3S	3 ele beam 10, 15, 20m	£499.95	£449.95
A4S	4 ele beam (10-20m)	£599.95	£529.95
R-6000	Vertical 6, 10, 12, 15, 17, 20m	£349.95	£315.95
R-8E	Vertical (40-10m)	£499.95	£449.95
X-7	7 ele 10, 15, 20m	£699.95	£599.95

MOBILE PENETRATOR

1.8-30MHz (200W PEP) mobile antenna - no ATU required. Length 102" (52" collapsed). Fits 3/8 mount (SO239 feed point)
OUR PRICE £139.95 delivery £10.00

New improved 'Wire Penetrator' 1.8-60MHz end-fed wire antenna (45ft long) £159.95

Q-TEK PENETRATOR

"WE'VE SOLD 100s ALL OVER EUROPE"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).
ONLY £179.95 delivery £10

SEND SAE FOR LEAFLET

Q-TEK ZL SPECIALS

Delivery £10.00

2m	5ele (boom 45"/9.9dBd)	£49.95
2m	7ele (boom 60"/12.5dBd)	£54.95
2m	12ele (boom 126"/14.5dBd)	£79.95
70cm	7ele (boom 28"/12.5dBd)	£39.95
70cm	12ele (boom 48"/14.5dBd)	£59.95

Q-TEK YAGIS

Delivery £10.00

2m	5ele (boom 63"/10.5dBd)	£49.95
2m	8ele (boom 125"/13dBd)	£64.95
2m	11ele (boom 156"/13.5dBd)	£94.95
2m	5ele crossed (boom 64"/10.5dBd)	£79.95
2m	8ele crossed (boom 126"/13dBd)	£99.95
4m	3ele (boom 45"/8.5dBd)	£56.95
4m	5ele (boom 128"/11.5dBd)	£69.95
6m	3ele (boom 72"/8.5dBd)	£59.95
6m	5ele (boom 142"/11.5dBd)	£79.95
70cm	13ele (boom 76"/14.9dBd)	£46.95
70cm	13ele crossed (boom 83"/14.9dBd)	£79.95

NEW DOUBLE DELUXE G5RV

160-10M double length (200 foot). **£84.95** del £8.50

DELUXE G5RV

P&P on either full/half size £6.50

Multi-stranded heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings.



Full size - 102ft (80-10m)	£42.95
Half size 51ft. (40-10m)	£36.95

Choke Balun £24.95 P&P £3

STANDARD G5RV

Full size 102ft (now includes heavy duty 300Ω ribbon)	£28.95 P&P £6
Half size 51ft (now includes heavy duty 300Ω ribbon)	£24.95 P&P £6

Q-TEK INDUCTORS

80mtr inductors + wire to convert 1/2 size G5RV into full size. (Adds 8ft either end) £24.95 P&P £2.50 (a pair)

DIPOLE CENTRE PIECES

Open wire	£5.99
SO-239	£5.99

300Ω HEAVY DUTY FEEDER

5m length	£5.00 P&P £3.00
10m length	£10.00 P&P £3.00

BALUNS & TRAPS

1.1 Balun	£25.00 P&P £2
4.1 Balun	£25.00 P&P £2
6.1 Balun	£25.00 P&P £2
40 mtrs Traps	(a pair) £25.00 P&P £4
80 mtrs Traps	(a pair) £25.00 P&P £4
10 mtrs Traps	(a pair) £25.00 P&P £4
15 mtrs Traps	(a pair) £25.00 P&P £4
20 mtrs Traps	(a pair) £25.00 P&P £4
5.35MHz Traps	£25.00 (a pair)

Practical Wireless, October 2003

CAROLINA WINDOM

CW-160S	(160-10m) 40m long	£139.00 P&P £8.50
CW-160	(160-10m) 80m long	£134.95 P&P £8.50
CW-80	(80-10m) 40m long	£99.95 P&P £8.50
CW-80S	(80-10m) 20m long	£119.95 P&P £8.50
CW-40	(40-10m) 20m long	£94.95 P&P £8.50

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc. Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.
On this cable simply wind cable round clamp 1-to-2 times. Simple yet effective!
OUR PRICE: 2 for £10 (p&p £2.50)

DOUBLE THICK FERRITE RINGS

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

COAX BARGAINS

RG-213 Mil spec x 100m.

ONLY £69.95 P&P £10

RG-58 Mil spec x 100m.

ONLY £35.00 P&P £10.00

Genuine high quality coax



SP-350 STATIC PROTECTOR

Designed to reduce static build-up during electrical storms. (Gas discharge fuse is replaceable). DC-500MHz (SO-239 sockets). PWR up to 400W.
£24.95 P&P £2.50

LOW LOSS PATCH LEADS

Connectors	Length	Price
PL-259 - PL-259	0.6m	£5.99
PL-259 - BNC	1m	£9.99
BNC - BNC	4m	£6.99
BNC - BNC	1.5m	£8.99
		+ £2.50 P&P

COPPER ANTENNA WIRE ETC

Enamelled (50m roll)	£12.95 P&P £5
Hard drawn (50m roll)	£13.95 P&P £5
Multi-Stranded (Grey PVC) (50m roll)	£11.95 P&P £5
Flexweave (H) duty 50 mtrs	£30.00 P&P £5
Flexweave H duty (18 mtrs)	£15.95 P&P £5
Flexweave (PVC coated 18 mtrs)	£18.95 P&P £5
Flexweave (PVC coated 50 mtrs)	£40.00 P&P £6
Special 200mtr roll PVC coated flexweave	£99.00 P&P £10
Copper plated earth rod (4ft)	£13.00 P&P £6
Copper plated earth rod (4ft) + earth wire	£18.99 P&P £6
New RF grounding wire (10m pack) PVC coated	£12.50 P&P £5

Q-TEK COLINEARS

P&P £10.00

QT-100 GF 144/70, 3/6dB (1.1m) glassfibre	£39.95
QT-200 GF 144/70, 4.5/7.2dB (1.7m) glassfibre	£54.95
QT-300 GF 144/70, 6.5/9dB (3m) glassfibre	£69.95
QT-500 GF 144/70, 8.5/11dB (5.4m) glassfibre	£149.95
QT-627 GF 50/144/70, 2.15/6.2/8.4dB (2.4m) "	£69.95

MOBILE ANTENNAS

P&P £8.50

DB-770M 2m/70cm (3.5 - 5.8dB) 1m PL-259	£24.95
DB-7900 2m/70cm (5.5 - 7.2dB) 1.6m PL-259	£39.95
PL-62M 6m + 2m (1.4m) PL-259	£19.99
PLT-20 20m mobile whip (56" long)	£24.95
PLT-40 40m mobile whip (64" long)	£24.95
PLT-80 80m mobile whip (64" long)	£24.95
PLT-259 PL-259 converter for above	£5.95

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W)	£79.95 P&P £5
RS-102 1.8-150MHz (200W)	£59.95 P&P £5
RS-402 125-525MHz (200W)	£59.95 P&P £5
RS-3000 1.8-60MHz (3kW) Incls mod meter	£79.95 P&P £5
RS-40 144/430MHz Pocket PWR/SWR	£34.95 P&P £2

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).



PULLEY £8.99 + P&P £2.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on

WALL BRACKET £2.99 P&P £1.00



MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling. (Fits up to 2" mast).

£8.99 + P&P £2.50

FIBRE GLASS POLES

Del £10.00

	1 1/2"	1 3/4"	2"
1m	£8.50	£10.50	£12.50
2m	£16.00	£20.00	£24.00

TELESCOPIC MASTS

6 section telescopic masts. Starting at 2 1/2" in diameter and finishing with a top section of 1 1/2" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 8 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs £109.95 12 mtrs £149.95 Carriage £12.00.

Telescopic mast lengths are approx.

Tripod for telescopic masts.....£89.95

CAR BOOT MAST SET

Once they've gone, they've gone! 5 section (15') 4.5m 1 1/4" slot together mast set. Collapsed length 0.92m (3') makes this ideal for travelling out with.

£24.95 Del £10.00 2 for £44.95 del £10.00 3 for £64.95 del £10.00

20ft BARGAIN MAST SET

4 x 5' lengths of approx 2" extruded (16 gauge) heavy duty aluminium, swaged at one end to give a very heavy duty mast set.
OUR PRICE £44.95 Del £10

TWO FOR £79.95 2 for £79.95 Del £12.50
THREE FOR £109.95 3 for £109.95 Del £15.00

NEW 20' (approx) SLEEVED SLOT TOGETHER MAST SET

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

£49.99 Del £10.00. **TWO FOR £90.00**

METAL WORK & BITS

P&P available on request

2" Mast base plate	£12.95 P&P £5
6" Stand off	£6.95 P&P £5
9" Stand off	£8.95 P&P £5
12" T&K Brackets	£12.00 P&P £8
18" T&K Brackets	£18.00 P&P £8
24" T&K Brackets	£20.00 P&P £8
10mm fixing bolts (needs 8mm hole)	£1.40 each
U bolts (1 1/2" or 2")	£1.20 each
8 nut universal clamp (2" - 2")	£5.95
2" - 2" cross over plate	£10.95
3-way guy ring	£3.95
4-way guy ring	£4.95
2" mast sleeve	£9.95
1 1/2" mast sleeve	£8.95
Standard guy kits (with wire)	£24.95 P&P £6
Heavy duty guy kits (with wire)	£29.95 P&P £6
Ground fixing spikes (3 set) powdered coated	£24.00 P&P £8
30m pack nylon guy 4.4mm/B/load 480kg	£12.50 P&P £3
132m roll nylon guy (4.4mm)	£40.00 P&P £7.50
Self amalgamating tape (roll)	£6.50
'Nylon' dog bone insulators	£1.00 each
Chimney lashing kit	£12.99

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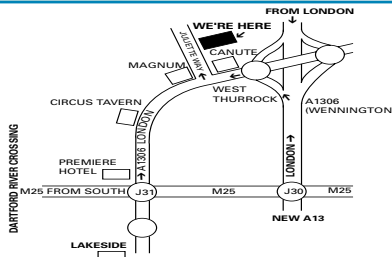
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TEX'S

TIPS & TOPICS

Hello and welcome to the occasional column that, although it's called **Tex's Tips and Topics**, (TT&T) is really about your ideas, tips and any 'tricks' you may use in the hobby. So, here's a few suggestions from readers seeking to win book vouchers for every tip published!

This month's tips include a knotty subject, toroid winding and measuring battery current drawn. I'll start with a tip from **Colin Topping GM6HGW/MM3ACL**, who remarked on a tip from **G0GJP**, to use a flame to 'whip' the ends of polypropylene ropes.

Colin was obviously not impressed as he wrote "The melting of plastic or polypropylene rope ends to prevent the lay from fraying is a most unsatisfactory procedure and does not reflect well upon our nation's great maritime heritage, in short it is most un-seaman like."

Warming to his subject Colin went on..."More pleasing to the eye and a far more durable solution to the problem is the use of whippings made from suitable twine or cod line. Old tarry 'sea dogs' like myself often refer to the practice of melting plastic rope ends as Yankee or lazy man whippings".

With his tongue firmly in his cheek, and after berating our Editor, Colin went on to say "May I respectfully refer you to two excellent journals, *Admiralty Volume of Seamanship Parts I and II*. Between the covers of these publications you will find instructive text and numerous plates demonstrating the care and maintenance of ropes etc, including whipping rope ends. Also described in full detail is the tying of a 'monkey's fist' (Fig. 1), to provide a weighted end to a rope for heaving aloft.

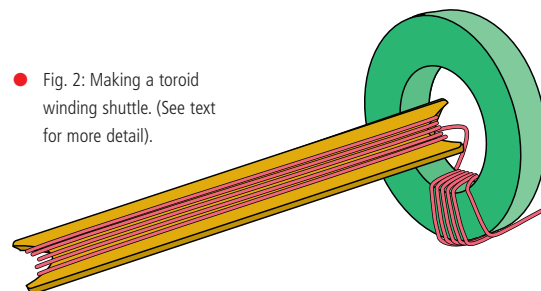
"This being a most useful item for rigging supporting rope guys for aerials over tree branches etc. As there is no stone or heavy metallic object attached, it is

therefore far safer, should the rope land upon the head of any onlooker". Colin signed himself: "Disgusted, Tarry and well salted Old Sea Dog, Lower Reaches of the Silvery Tay".

Moving swiftly on from Tayside, but still in Scotland, I now have a couple of tips from **Mike Beith GM0OXS**, one of which is to make winding toroidal coils easier. But I'll let Mike explain as he wrote "Winding toroids, or at least winding a few turns with a thicker gauge of wire, is usually quite easy and a small number of turns means a short length of wire is used. However, winding a toroid with a significant number of turns of a lighter gauge wire, can be tricky, as wire damage occurs easily.

"Carefully wind the wire on a piece of card, narrow enough to pass through the hole of the core, Fig. 2. Estimate the length of wire needed plus enough for terminations and lay it on the shuttle. It's then a simple matter to pass the shuttle and wire through the core gradually unwinding the card as needed. The card is easier to handle than a long length of wire getting in a tangle or 'fankle' as my XYL would say up here in GM land".

Thanks Mike that's a great idea for those coils with more turns,



such a simple idea, but one that would make winding them, much easier. Now let's turn to Mike's other idea, which is aimed to make testing current drawn, in battery powered items, easier to read.

Again, I'll let Mike explain in his own words. "Quite often it is



● Fig. 1: A monkey's fist knot, makes a good, and safer rope's end than a heavy stone or metal block says Colin GM6HGW / MM3ACL. Donna G7TZX thinks it makes a fine 'attention getter' when used on editors!

necessary to check the current drawn by a battery powered circuit. This usually entails desoldering a connection to insert the meter.

This small testing jig, Fig. 3, saves having to desolder a connection when measuring current in a battery pack that contains separate cells.

Mike continued "the test jig, Fig. 3, consists of a small piece of double-sided copper clad board with either a simple wire loop soldered on each side of the p.c.b. for the meter clips, or single wires taken to plugs

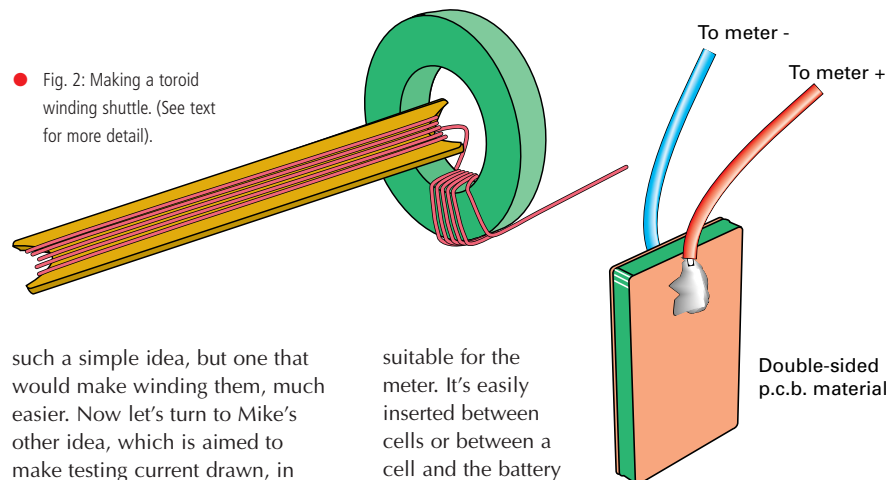


handy in the tool-box". I couldn't agree more Mike, it's usually the simple ideas that are the most difficult to come up with.

"Well, I've run out of space again. These are all splendid ideas, and a good cross-section of some of the useful tips that readers keep sending in. Many thanks for the

tips that you've all sent in, they're all very useful. Book vouchers on the way for all published. So, if you want a book voucher for an idea - you've got to write in first! - What are you waiting for?

Tex



suitable for the meter. It's easily inserted between cells or between a cell and the battery box terminal. Different sizes can be made for various cell sizes and kept

● Fig. 3: A simple current measuring jig, may be placed anywhere in the battery pack to monitor the supply current. (See text for more detail).

Low-Pass Filters and the 144MHz Band

So, you think that there's no need to use a low-pass filter when using v.h.f.? Nigel Booth M1DKN suggest otherwise ... and provides a suitable design.

There's much misunderstanding regarding filters and suppression at v.h.f. Many texts suggest one method, whereas others may lead you on a totally different path. I shall try to clear up this misleading information as well as explaining why filtering is such a necessity practice on all bands (d.c. to blue light). You may well think "Oh no, not another righteous person about to tell us that we have been doing it wrong for years"! Well no, I'm just providing a few ideas and guidelines to get you on the right path ... especially for those newer operators who, perhaps, haven't yet got that all important filtering sorted to the best of their ability.

Firstly, why do we need extra filtering? Well, the answer quite simply is because all radio transmitters produce what are known as harmonics. You know, those are the things we learnt about whilst studying for the Radio Amateur Examination (RAE).

The second harmonic of 144MHz falls into a portion of the radio spectrum that's primarily used by military aircraft (the RAF). However, the third harmonic falls right back within our own Amateur bands (this is also true of signals supposedly in the 430MHz band).

Best Ability

It is good practice however, to be careful and to our best ability, to

filter out any unwanted harmonics that may be generated. As I said previously, this is where a conflict of ideas comes into being!

There is one camp opting for the high-Q band-pass filter at the output of the amplifier stages or linear amplifier and those who opt for the low-pass filter and/or possibly the harmonic notch filter. So, you have a choice of opinions!

The correct method of filtering ("oh no, here he goes again" I can imagine you saying!) is by means of a low-pass filter and/or a harmonic notch filter. The reasons behind this are as follows: The practice of putting a high-Q band-pass filter at the output of an amplifier can be extremely damaging to both your equipment and to your on-air reputation.

The smallest amount of mis-tuning or mis-match at the antenna, which can very easily be done, can result in a very high s.w.r. Unless, your coaxial cable is both lossy and long, then this high s.w.r. at the antenna is transferred back down to the rig.

There are other risks too! Trying to use maximum power, with a sustained s.w.r. of greater than 3:1 can damage or even totally destroy some solid state output devices, many of which don't take too kindly to this sort of treatment.

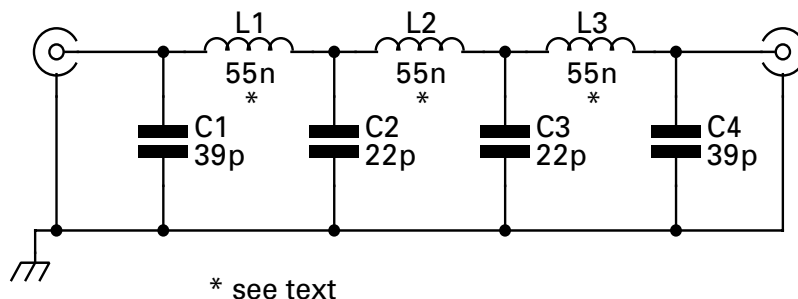
Running with a high v.s.w.r. and a 'cooking' p.a. stage, can also cause high intermodulation products or over-deviation throughout the band. It could possibly even affect other bands ... adjacent to the one you're using.

Nearby Stations

Nearby Amateur Radio stations may not take too kindly to the extraneous 'rubbish' and may be even less tolerant than your equipment. After all, you should know better ... shouldn't you? Fortunately, the problem of unwanted signals is easily overcome, especially with the simplicity of the

WS2219

Fig. 1: A seven-element low-pass filter follows the 'traditional' form. For high power clad silver mica capacitors should be used - see text for more details.



low-pass filter from the constructors point of view. At least those intermodulation products above the wanted band, are reduced to a low level after your signal is passed through a low-pass filter.

The seven pole filter described in this article should offer second harmonic rejection of around 30dB and third harmonic rejection of 60dB+. It also demonstrates a very low insertion loss. The components used should be satisfactory for power levels up to 100W, as the capacitors are of the metal-cased mica type.

The circuit is of a relatively simple symmetrical low-pass filter. It combines three identical inductors of 55nH each, and four capacitors of two values as shown in the circuit diagram of Fig. 1.

Causes Problems

Creating the correct value inductors sometimes causes, problems, but winding the coils for this low-pass filter is quite easy. Each coil consists of three and a half turns, Fig. 2, of 1mm diameter enamelled copper wire, with the turns spaced one wire diameter apart.

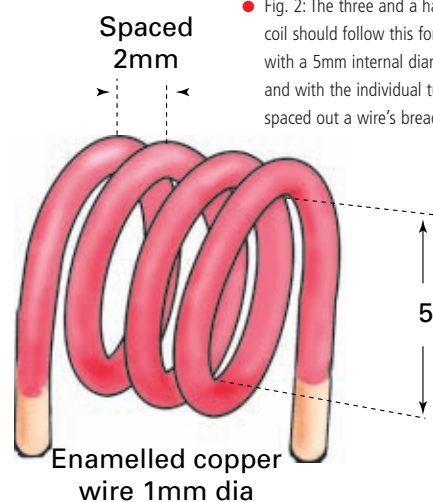


Fig. 2: The three and a half turn coil should follow this format, with a 5mm internal diameter and with the individual turns spaced out a wire's breadth.

The turns are wound on a 5mm diameter former, which is removed after winding. And to get repeatable coils, I suggest that you try winding two coils at once. Both coils being wound interleaved with two wires laid side by side at the same time. Then after the turns are 'set' by pulling the wires tight, you should separate the two windings and you have two (almost) identical coils. Repeat this procedure and you have one spare coil too!

Should you be going only to use low power (up to about 20W) then simple mica capacitors would be suitable for the filter. But for higher power levels you really should use the jacketed mica type.

Well that's it, quite simple really. Good constructing, and hopefully you'll have clean signals from here on!

PW



● The Yaesu FT-2800M 144MHz f.m. transceiver...a rig which John GOSKR thoroughly enjoyed using.

The Yaesu FT-2800M V

John Goodall
GOSKR takes a
look a v.h.f. f.m.
mobile
transceiver. Not
another
mobile!, you
may say...but in
reply John
assures us this
rig is something
rather
different!

"Here we go again"....I can imagine you saying...." yet another boring single band Amateur Transceiver". But just hold your horses a moment before you dismiss the rig....this is something different....so please read on to find out why!

To be quite frank...at first I wasn't unduly excited upon receiving the review model in its traditional Yaesu eco-friendly brown cardboard packaging. However, upon opening the familiar brown cardboard box, I found lurking in the depths, a rather surprising piece of kit. So, working together...let's take a look at what I discovered.

Inside the box there was a 'A wolf lurking', but not quite 'in sheep's clothing'...as I was soon to find out. The FT-2800 transceiver actually measured a healthy 156(w) by 50(h) by 200mm (d). In 'real money' (imperial) that means the rig measures almost 6 by nearly 2 high and 7in from front-to-back.

The transceiver tipped the scales at nearly 1.8kg or almost 4lbs in old money. Quite a large unit by today's standards, particularly for a single band 144 – 146MHz transceiver. However,

this is no ordinary single band transceiver. Also lurking within the box was the large, and useful, DTMF microphone, the Yaesu MH-48. (This item I shall look at in detail later).

Rugged & Sturdy

The sheer weight and rugged look of the FT-2800M immediately put me in mind of sturdy military equipment I've come across over the years. It's certainly impressive!

In fact...the weight is all down to the fact that the entire casing is a massive heatsink. This is necessary because the output power of the FT-2800M being a very impressive 65W on high power, also generates quite a bit of heat.

Despite the high power outputs...there's no troublesome fan on this rig! No, there isn't a noisy hairdryer in the background (as once described to me)...instead there's just one heck of a heatsink.

The FT-2800M has four power settings of up to, and including 65W on transmit. Transmitting only on the European Amateur Bands, it also has extended receive facilities from 137 to

174MHz. The rig has 221 programmable memories - plus up to 31 of what Yaesu refer to as **Smart Search Memories**.

The transceiver has a built in Continuous Tone Coded Squelch System (CTCSS) and Digital Coded Squelch (DCS) Encoder/Decoder. Various Scanning modes, band scan limits, programmed scan and priority scan, are available for use. These I tried and found to be successful, but other than the **Memory Scan**, I did not find the others personally useful.

The radio has a **Weather Broadcast Facility**, giving 10 weather broadcast channels to search...although this service facility is not available in the UK. The transceiver also has facilities to link via the DTMF keypad, Vertex Standard **WIRES** (Wide-coverage Internet Repeater Enhanced System) Internet linking system. The latter is mainly for use in the USA, although such links are now appearing in the UK.

Tradesman's End

Starting with the tradesman's end of the FT-2800M (that being the rear) things couldn't be simpler.

Here you'll find only two connections and one socket.

The first connection, the short red and black, **d.c.** (Direct Current) input lead requires the customary 13.8V d.c. input. The lead has a 15A in-line blade type fuse and terminates in the common T spade connector found on many new rigs.

The second connector is the all important chassis mounted SO239 socket for attaching the 50Ω antenna for 144MHz. The rear mounted 3.5mm mono jack socket is the only other item on the rear panel, and is used for the connection of a 4Ω extension speaker, capable of handling 3W of audio power.

settings/Alpha Numeric label) and **D/MR** (this switches between **VFO**, **Memory** and **Home Channels**).

There's a sixth button - adjacent to the front facing modular socket for the MH-48 Microphone. This is for use when the transceiver is used in conjunction with an Internet connection.

Connecting Up

I connected the MH-48 Microphone to the modular socket on the front. Next, I chose a suitable antenna to be connected with the rear mounted SO239.

of the power button. The first (above the MHz button) is **SET**; the second (above the REV button) is **DW**; the third (above the LOW button) is **A/N**; and the fourth (above the D/MR) is shown as **MW**.

The Microphone

Before I describe my experiences on the air...I should first describe the MH-48 DTMF Microphone. And here I can confidently say that it matches the ruggedness of the FT-2800M itself, as it's quite chunky, solid and easy-to-hold.

The MH-48 microphone is an amazing tool for easy operation

HF FM Transceiver

Front Panel

Now to the uncluttered front panel...and again, nothing could be simpler. It sports a large, 78 by 26mm (3 by 1in to us oldies) - liquid crystal display (l.c.d.). There are also three single function rotary controls together with a row of five sensible sized push button controls.

The two sensible easy-to-grip rotary controls positioned at the top left of the front panel are **Volume** and **Squelch** respectively. The third rotary control, is a 'beefy' sized 28mm diameter (just over an inch) knob providing the **Tuning** and most **Function** settings, including memory selection.

The five buttons, comfortably located under the l.c.d. control almost all of the rig's functions. The first - red button is a single action control marked **PWR** (power - push for one second to toggle on/off).

The other four main buttons - to the right of **PWR** are dual action controls. The first is **MHz/SET** (1MHz tuning steps/Memory Set). The, **REV/DW** (reverse repeater function/Dual Watch), **LOW/AN** (selects one of four power

My next job was to connect the set to the power supply using the enclosed d.c. cable. Incidentally, the d.c. power cable has a standard T configuration Lucar type connector and is almost 2.5m (over 8ft 2 inch) long.

The T-type connector is used to provide an easy connection to the short d.c. power lead which emerges from the set. This lead carries the socket for the T connector. In all, there's a total of three 15A in-line blade fuses forming the 'belt and braces' protection for this powerful rig.

Powering up is achieved by holding the PWR switch for a second to switch the set on. Switching off is equally easy...pressing the control again for one second turns the power off.

Once on, the FT-2800M reveals its impressive, easy-to-read main l.c.d. This has large and clearly defined numerals and it then shows the default **144.00MHz**, in the centre of the display, with **VFO** displayed in the lower right hand corner.

Also shown (along the lower edge of the display) are the following second function icons for the four buttons to the right

of the main transceiver. It has a numeric keypad, similar to that on a modern telephone which is numbered 1 through to 0 with two additions * (star) and # (hash).

Also provided is an additional vertical row of buttons simply marked **A to D**. These buttons cover the centre to upper portion of the microphone, with four additional programmable buttons below. These are identified as P1 - P4.

The buttons can be programmed with any of a dozen different choices, from a simple 1750Hz tone burst, to displaying (on the l.c.d.) the voltage into the set from its power source. To the left of the microphone is the push-to-talk or p.t.t. control switch.

To the right there are two slide switches (located on the right hand side as you hold the microphone with the keypad facing you). The upper slide switch is the **Lock** facility, this simply locks the functions of the microphones keypad - other than the numerical keys and **PTT**, thus preventing unwanted operations.

The lower slide switch I found to be a very useful little number

Product

Yaesu FT-2800M 144MHz f.m. mobile transceiver

Company

Yaesu UK Ltd

Contact

Sales on (01962) 866667

Pros and Cons

Pros ... "I've got to say that I found the beefy YAESU FT-2800M to be an excellent piece of kit. And at an affordable price of around £160 it should prove a good seller.... I thoroughly enjoyed using it and with all the numerous contacts made, I have never received any adverse comments as to the audio quality of my received signal".

Cons Single band use

Price

£179 inc VAT

Summary

I would like to take this opportunity to thank Yaesu UK for loan of the review model, and I think I must have tightened the mounting bolts too tight as I can't get the rig out of the car!

Supplier

Yaesu UK Ltd,
Unit 12, Sun Valley Business Park,
Winnall Close,
Winchester,
Hampshire SO23 0LB.
Tel: (01962) 866667,
FAX: (01962) 856801.
E-mail: sales@yaesu.co.uk

The five buttons, comfortably located under the l.c.d. control almost all of the rig's functions.

Continued on page 26

as it's used to activate the keypad illumination. When this is activated, the numerical and A – D keys, took on a pleasant red glow, making them easy to read in the dark.

Along the upper edge of the MH-48 are two push-buttons, simply marked **DWN** and **UP**. These controls...as the TV advert says... "Does what it says on the tin"...and operate the **UP** or **DOWN** functions normally controlled by the front panel rotary control.

No Degree Needed!

Some modern rigs require a University Degree in origami or knitting or some such equivalent to enable the user to programme frequencies into transceiver memories of the unit. But that's not the case with the FT-2800M!

Instead, I found (being a simple type myself) the programming to be simple...in fact it was very simple indeed! So, I started to programme the rig by entering a required frequency into, and therefore onto the large display using the HM - 48 Microphone.

To enter a frequency of 145.200MHz into the v.f.o., and

● The FT-2800M has an extremely bright and clear main display - shown to advantage in this photograph. The simple front panel lay out (with large dual-function main tuning control) is backed up by an excellent receiver and many easy-to-use features. (see text).

subsequently into a memory location, on the keypad of the HM-48 all I had to do was to input 1- 4 - 5 - 2 - 0 - 0 directly from the numerical keys. Next, I simply pressed and held (for one second) the **D/MR** button on the front panel of the set. The next available numerical channel number then started to flash on the right hand side of the l.c.d. (This channel number location can be used by a simple momentary press of this same **D/MR** button).

If another location had been required I would simply have turned the rotary dial or used the **UP** or **DWN** buttons on the microphone to select another memory channel. And...Hey Presto - there was one frequency into one memory location in as few moves as possible.

However, I can now hear someone at the back of the room



shouting..."What about a repeater frequency"? And in reply I can say..."Yes"...that's all taken care of by the FT-2800M - it automatically selects a repeater shift of -600kHz as you enter any frequency between 145.600 and 145.775MHz. (This can be changed to suit the operator and his location). Yes I can hear the same person shouting again at the back...."What about other offsets such as the French repeaters"? Again...Yaesu have thought about that as well - you can simply input any duplex frequencies into any memory channel.

So, now have a couple of frequencies entered into the FT-2800M memories I can go straight into operating without

any trouble whatsoever. But, I started thinking...and put on my teaching head, and considered the entry level operator.

The Foundation Licence operator is restricted to a maximum of 10W fed to the antenna on 144 - 146MHz, and the Intermediate Licence operator is restricted to 50W. However, this is not a problem for the FT-2800M.

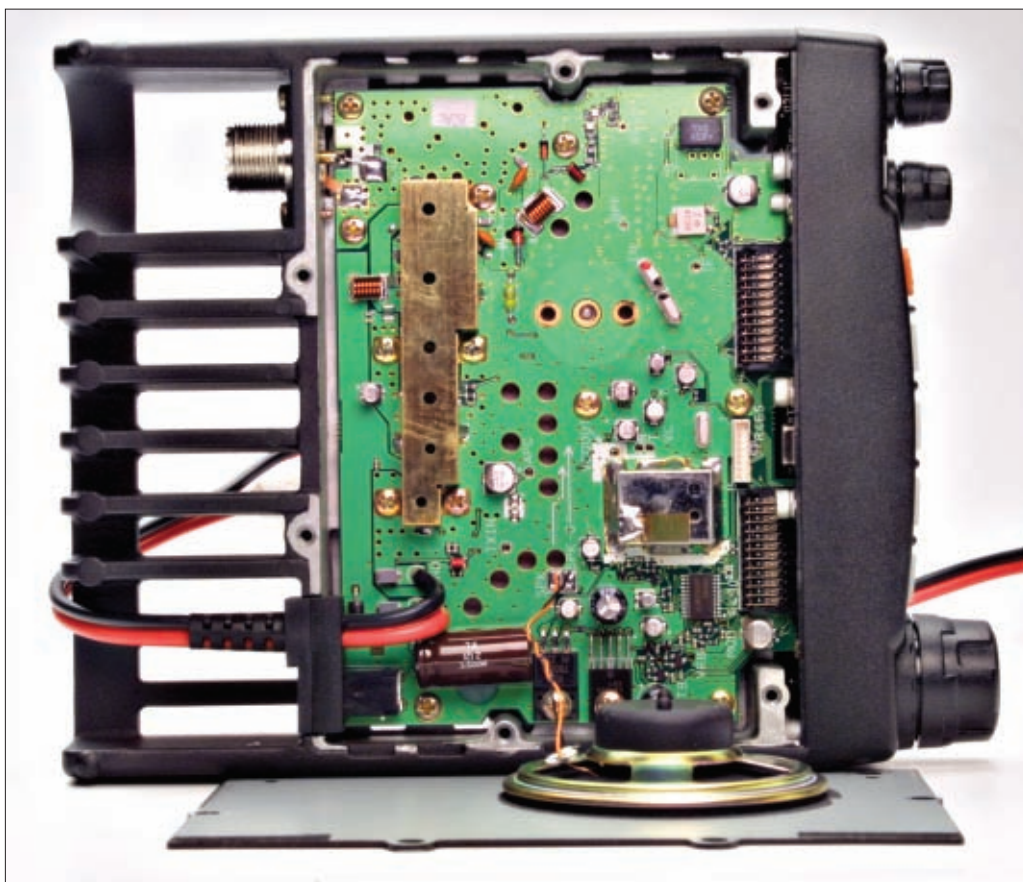
Incidentally, I found that the four power settings were very accurate on the review model. **HIGH** - measured at 65W; **MID** - was 25W; **LOW 2** - 10W and **LOW 1** was 5W. Without modification, the FT-2800M can be legally operated within the confines of both licences. In fact...the extra power, could even be seen as being an incentive for the operator to progress further in the hobby.

Alpha Numerics

One of the features of this cracking little transceiver set is the ability to use Alpha/Numerics to name any and all channels. Using this method instead of the unit displaying (for example) my local v.h.f. repeater frequency of 145.625MHz, I changed the display to read GB3SC...the Bournemouth-based repeater.

In fact, any channel can be changed to display any Alpha/Numeric text up to six characters in length. (Alpha/Numeric can be accessed by entering the **SET** mode).

Entering the **SET** mode provides 33 operator definable functions to be changed as needed. To enter the SET mode, you have to simply press and



● An inside view of the transceiver with top panel removed. This clearly shows the massive heat-sinking used in the high power f.m. transceiver - removing the need for a cooling fan (see text).



hold for one second, the **MHz** (SET) button and move through the 33 options by turning the main rotary **Tuning** control.

When you've decided which of the 33 options to select, a momentary press of the **MHz** (SET) key will allow changes to be made to whichever page of the 33 is displayed. For an example, **00 ALPH**, in SET mode is for programming Alpha/Numeric labels to memory channels. Another example - **07 DIMR** - is for setting the l.c.d. illumination level as **1, 2, 3** or **OFF**

Memory Channel

The procedure for applying an Alpha/Numeric Tag to a memory channel does, however, take a little longer than the initial frequency setting. With the memory channel, in my case Memory 01, displayed on the l.c.d., I simply pressed and held the **MHz** (SET) button, for one second and by doing so accessed the SET mode for the radio, selected **00 ALPH** and then pressed the **MHz** (SET) button momentarily.

The first character location will then blink on the screen. Rotating the dial knob allows letters, numbers or characters to be selected for that space. Pressing **D/MR** moves to the next character location.

Pressing **MHz** (SET) momentarily saves the name entered and by pressing and holding the **MHz** (SET) button at this point, exits the SET mode and reverts the rig to normal operation.

Useful Smart Search

One very useful facility I found with FT-2800M, was the **Smart Search Operation**. This facility allows the operator to select a particular frequency in **VFO** mode. All you have to do is to enter and start the Smart

Search, and the radio will automatically search above and below the selected frequency for any activity, automatically storing any busy frequencies in up to 30 Smart Search Memories. These are 15 above and 15 below the fundamental frequency chosen, making a total of 31.

As an example, I visited Brighton, whilst reviewing this radio, and, not being certain of Amateur Radio activity within the Brighton area, Smart Search would seemingly come into its own. First I entered the SET mode, by pressing and holding for one second the **MHz** (SET) button.

Next, I then changed the display to page **30 S SRCH**. Pressing the **MHz** (SET) button momentarily then to enter the Smart Search mode. Two modes are available for Smart Search; **SINGLE** and **CONT**. I turned the tuning knob so **SINGLE** was displayed. This meant that a single sweep above and below my desired frequency would be automatically searched, and any frequencies occupied would be stored.

Had I selected **CONT**, then the set would Smart Search continuously above and below my chosen frequency until all 30 memories had been filled. Simply pressing and holding for one second, the **MHz** (SET) button returned the set to normal operation.

I set a frequency of 145.500MHz into the v.f.o., entered the Smart Search mode by pressing the P2 button on the MH-48 Microphone. The SS icon then appeared in the lower left corner of the display to indicate that **Smart Search Mode** was now active. By pressing the A button on the MH-48 microphone the search was under way.

No obvious evidence of the search being visible on the display, the radio then searched above and below my selected frequency of 145.500MHz and several occupied frequencies then stored in the Search Memories. After the Search was complete, identified by the return of the display to Smart Search Memory Channel **00**, I then turned the tuning knob to check frequencies stored.

Altogether it was a very simple operation from any selected frequency within the receive capability of the FT-



● The FT-2800M is supplied with the Yaesu MH-48 multi-function microphone. In the review John Goodall G0SKR comments on the useful features provided by the microphone (see text).

2800M. (I've used this facilities have used many times on Marine Frequencies...it's excellent)..

On The Air

During the transceiver evaluation period, enjoyed with this useful FT-2800M I operated on the air from many different locations. In fact my travels took me from the south coast to the English Midlands. I thoroughly enjoyed using it and with all the numerous contacts made, I have never received any adverse comments as to the audio quality of my received signal.

Initial tests with the FT-2800M carried out in my local area (Bournemouth), resulted in my contacting many local Amateurs. **Sean 2E1SPS**, **Terry M3TFW**, and **Keith G4GCA** are just a few of those who took time to give me reports on audio and signal strength. During the early part of August, conditions being reasonable, I set up mobile operation from just outside nearby Wimborne, and made several contacts

through the Caen repeater in Northern France.

One contact through the Caen repeater that gave me a superb test for the receiver of the FT-2800M, was with **Mark G0EBB** from Haywards Heath, in West Sussex. Whilst having a nice old natter, I checked, and could clearly hear him on the repeater's input.

However, even though I had the FT-2800M on high power Mark was unable to hear me on the input. Although with the fine receiver of the FT-2800M, I could hear him with a good S3-5. (Thanks Mark, and **John G4ZTQ** for their comments of "Good audio" during this QSO).

In rounding off this report I've got to say that I found the beefy Yaesu FT-2800M to be an excellent piece of kit. And at an affordable price of around £160 it should prove a good seller. I would like to take this opportunity to thank Yaesu UK for loan of the review model, and I think I must have tightened the mounting bolts too tight as I can't get the rig out of the car!

PN

Radio Basics Goes VHF!

In the second part of the Radio Basics special Phil Cadman G4JCP describes the transmitter section of the 70MHz project. Phil also provides some modifications for the 70MHz receiver...including a double-conversion option.

The complete circuit of the transmitter is shown in **Fig. 1**. As you can see, it's quite simple and very easy - electrically speaking - to build. However, building it so that it's stable enough to be used as an exciter for an Amateur transmitter is rather more of a challenge!

The heart of the transmitter is the v.f.o., which in our case oscillates at half of the transmit frequency: a little above 35MHz. I've chosen a field effect transistor (f.e.t.) for the oscillator as they can

The f.e.t. I used was a 2N3819, but any similar device - such as an MPF102 or J310, for example - should work just as well. Because of the characteristic spreads of f.e.t.s, you may need to change the value of R6a from the value shown in Fig. 1.

Ideally, Tr1a should draw between 2mA and 3mA; that's equivalent to 200 to 300mV across R8a. Start with the 390Ω resistor shown and increase or decrease the resistance as

You'll soon be calling

Building a transmitter is a rather more serious undertaking than building a receiver. If you make a poor receiver, then you'll be upset. Make a poor transmitter, and a lot of other people could be upset. (Not to mention the prospect of a visit from the authorities!).

If you've never built a transmitter before, then it's a good idea to build one or more low power transmitters simply to gain experience. This transmitter is an ideal project to help fulfil that aim. Working on 35MHz and doubling to 70MHz, the problems that beset v.f.o. controlled transmitters are considerably heightened. Make

a good job of building this transmitter and you can be justly proud of yourself.

The circuit I'm going to describe is more of an exciter than a transmitter. It runs too little power for it to be effective over all but very short distances, and in any event, it should never be connected directly to an antenna as the output has insufficient filtering.

Your first 70MHz project is really intended to be used to drive an r.f. power amplifier, although it can be useful around the shack as a signal source. While this is a low-power device, once built it should still be housed in a screened enclosure.



- The simple 70MHz transmitter project...which will provide 'first time' v.h.f. constructors with some interesting practice!

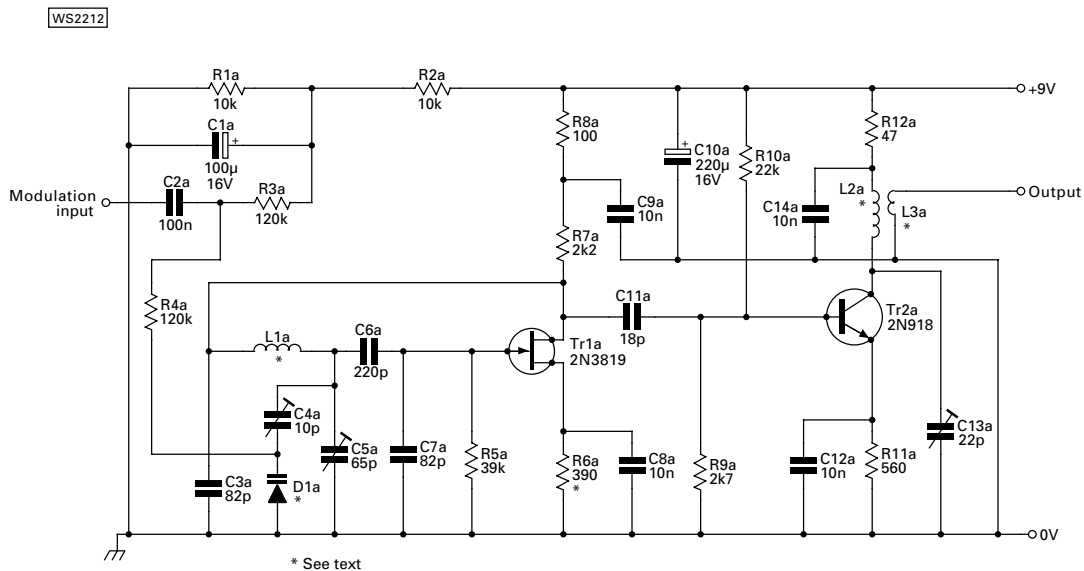


Fig. 1: Circuit of the transmitter which is - as shown - intended as a constructional exercise rather than 'on the air' project. With the additional of a driver stage and full filtering the transmitter can then be used to form a full transmitter.

required. Alternatively, fit a 1k Ω variable resistor.

The v.f.o. frequency is determined by L1a and the series/parallel combination of C3a, C4a, C5a, C6a, C7a and D1a...plus the gate and drain capacitances of Tr1a and other stray capacitances around the circuit. **Be aware that at 35MHz, strays of only a few picofarads can make quite a difference.**

All fixed capacitors below 220pF should be ceramic plate, and all the 10nF bypass capacitors are ceramic discs. The audio

don't worry the maths isn't too complicated!

Resonating At 70MHz

For our worked example, let's say that we want the tuned circuit to resonate at 70MHz with C13a fully enmeshed; that's 22pF. Stray capacitance will increase this figure by some unknown amount, but we can always reduce the capacitance of C13a, or take turns off the coil, to compensate.

Rearranging the formula for resonance, we get

Having made up a prototype coil, solder it in place and use a grid-dip oscillator to find the actual resonant frequency of the circuit.

Mathematically inclined types can now estimate the stray capacitance in the circuit and repeat the calculations to get the correct inductance. People like you and me can simply remove one turn at a time from the coil until the frequency is close to what we want with C13a about two thirds enmeshed. (You can fine-tune the coil by stretching or compressing the turns a little).

In my prototype, L2a came

insulated 0.6mm hook-up wire wound over the 'cold' end of L2a. That's where it will have least effect on the L2a/C13a resonant circuit. In fact, always position coupling loops over or near the cold (earthy) end of any tuned circuit.

Once the transmitter is complete and the oscillator running, C13a can be adjusted for minimum voltage drop across R12a. With no load connected to L3a, Tr2a's collector current should dip to just below 2mA. The dip will not be so pronounced if the stage is driving an amplifier or if

g QRZ on 70.26MHz!

coupling capacitor C2a isn't critical; any type of dielectric will do. The trimmers are miniature film dielectric types and the resistors are carbon or metal film 250mW.

I initially calculated the v.f.o. coil (L1a) to be around 400nH. That inductance turned out to be too large (for reasons I'll mention later) so off came a few turns. In the end, L1a came out to 7 turns of 0.71mm (22 s.w.g.) tinned copper wire, 12mm inside diameter, stretched to a length of 10mm.

In the photograph, you'll see that the coil is self supporting. That's fine for checking the v.f.o. is on the correct frequency, **but it's an absolute disaster as regards stability.**

The 35MHz output from the drain of Tr1a is capacitively coupled into the base of our doubler transistor, Tr2a. Again, Tr2a isn't critical. I had a 2N918 to hand, and so that's what went into the circuit. Any v.h.f. device with reasonable gain will work just as well.

The collector tuned circuit - L2a and C13a - must resonate at 70MHz. Although we can estimate what the inductance of L2a ought to be - and this will give us our starting point - some in-circuit adjustment will inevitably be necessary. In particular, the collector capacitance of Tr2a and other circuit strays will have a considerable effect on the resonant frequency. So, let's now look at what we have to do....but

$$L = \left(\frac{1}{2\pi * 70\text{MHz}} \right)^2 \frac{1}{22\text{pF}} \mu\text{H}$$

Once we have a value for the inductance, we can use either Wheeler's Formula or some coil tables to get the diameter, length and number of turns required.

out to eight turns of 0.71mm (22 s.w.g.) tinned copper wire, 7mm inside diameter, and stretched to 10mm length. This time L2a can be self supporting as it doesn't affect the v.f.o. frequency, but it still needs to be rigidly mounted.

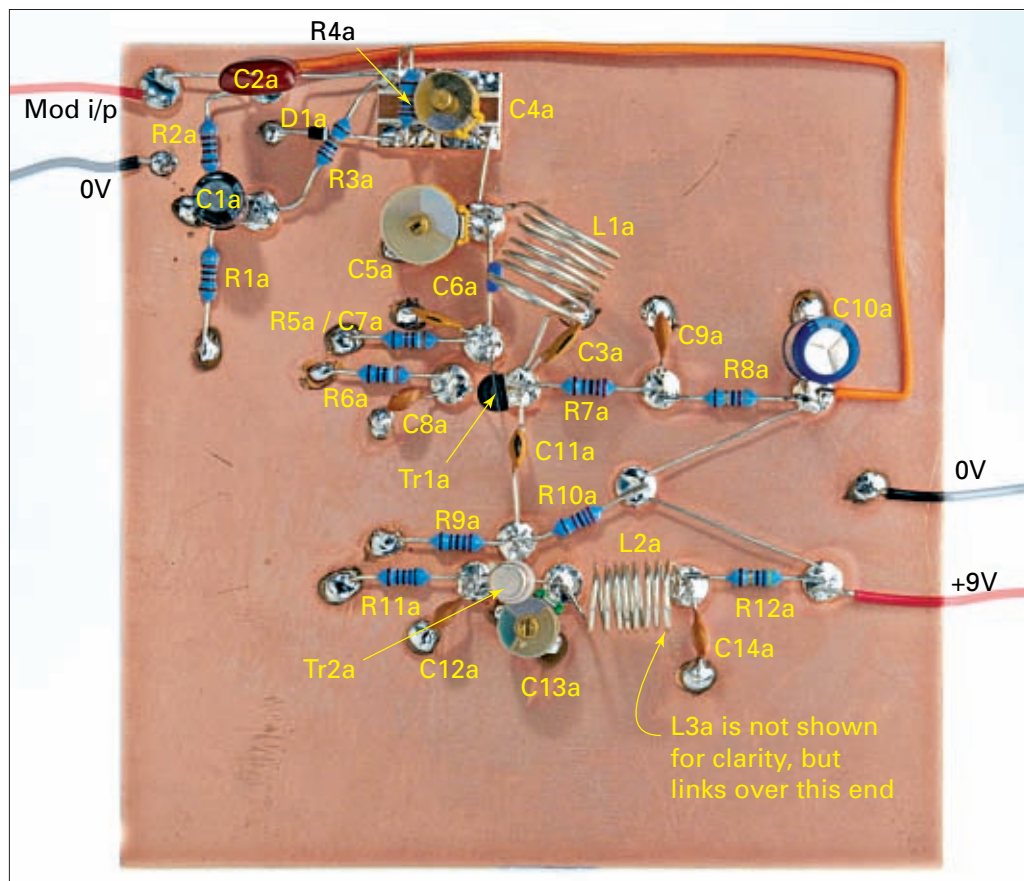
The output coupling loop, L3a, is made from two turns of

it's feeding a band-pass filter and thence an antenna.

Varicap Diodes

One of the frequency-determining elements in the oscillator circuit is varicap diode D1a. Rather than

● Fig. 2: Annotated photograph of the 70MHz basic transmitter project (see text).



Radio Basics SPECIAL

use my favourite 'varicap' diode - a 1N4004 rectifier - I thought I'd better set a good example and use a genuine varicap - a BB405B - this time. Unfortunately, genuine varicaps are a little on the expensive side so you may want to try a 1N4004 first.

The diode is biased to half supply by the potential divider formed by R1a and R2a. The capacitor C1a provides decoupling. Audio, fed through d.c. blocking capacitor C2a, varies the voltage across D1a. This produces true frequency modulation; the capacitance of D1a - and hence the oscillator frequency - varying in sympathy with the instantaneous audio voltage.

Actually, D1a also allows a degree of fine tuning. This is because if the d.c. bias across D1a is made adjustable (say, over a volt or so) then the v.f.o. frequency can be altered electrically. This adjustment is sufficient to cover several f.m. channels. I've included C4a to adjust the degree of electrical tuning; it also has the side effect of altering the sensitivity of the circuit to the amplitude of the applied audio.

To set the v.f.o. on frequency, first fully enmesh C4a and adjust C5a to the centre of the required tuning range. Vary the d.c. voltage across D1a by, say, $\pm 0.5V$ and measure the change in frequency. If the range is too great - as is likely - reduce the setting of C4a and increase the setting of C5a to compensate. Then re-measure (should the range be too small, you can increase C4a to 22pF, but I wouldn't go any larger).

When the range is about right, you can apply an audio signal and check the deviation on a receiver. Although this is best done by measurement, the deviation can be set by ear by comparing it to a transmitter with known deviation as a reference.

Audio Pre-amplifier

I've not shown any audio pre-amplifier, which will be necessary if you want to use a microphone as an audio source. If you put the transmitter on the air, I'd suggest using an audio low-pass filter between the audio source and C2s. The filter used in the accompanying 70MHz receiver - published last month - is ideal.

As I've already said, this circuit is quite easy to build and get working. However, it's relatively difficult to make the v.f.o. stable enough to actually use the transmitter on the air...so let's look at the problems.

To start with, there are several things

that can affect the frequency. The v.f.o. will drift due to changes in temperature; the obvious cause is the change in value of the capacitors as their temperature varies.

Unfortunately...the coil will expand and contract with temperature as well. This is one reason why the coil - when the number of turns, etc., have been determined - should be tightly wound on a rigid, thermally-stable former.

Temperature-related problems can be largely overcome by using capacitors with different - and opposite - temperature coefficients. As one or more capacitors increase in value, another capacitor decreases in value by just the right amount to cancel the change as they're effected by temperature changes. But as this is rather messy to set up and adjust, it's clearly not worth doing in our case.

Voltage & Frequency

You'll also find that changes in supply voltage affect the frequency. Naturally, changing the voltage across the varicap diode will change the frequency, but changing the supply voltage will also cause tiny changes to the internal capacitances of the transistors, and those changes will affect the frequency too. In short, always use a power supply with a stable and noise-free output for oscillator and multiplier/buffer stages.

It's worth trying the transmitter with a self-supporting v.f.o. coil, to see just how microphonic the v.f.o. can be if components are not rigidly mounted. Indeed, my prototype proved very microphonic!

Tapping the bench (on which I'd placed the transmitter) produced loud 'clanks' in the loudspeaker of my monitor receiver. And placing the loudspeaker close to the transmitter actually caused howl-round!

Who needs a microphone? I found shouting near the coil would modulate the transmitter quite effectively! Indeed - it was acting like a real 'mechanical frequency' modulation modulator!

I hope you enjoy your first attempt at building a v.h.f. exciter/transmitter. You'll certainly be grateful for the help of your grid dip (or gate dip) oscillator in checking resonance. And from experience...I know quite a few of you will be considering buying a frequency counter too!

Finally, which may be found in the separate panel (opposite), as promised...I'll now look back at the receiver to suggest some modifications.

Receiver

Please note: The modification and 'extras' in this section all refer to the 70MHz receiver published in the September 2003 issue of PW. Therefore, all the figure numbers refer to that issue and to indicate this fact...they are printed in a non bold typeface. **Editor.**

Although our receiver has been designed for 70MHz, there's no reason why it could not be adapted to cover other bands....particularly 28 and 50MHz. All that's needed are changes to the input tuned circuit - L1/C26/C27 - and the local oscillator tuned circuit - L3/C30/C31/C32/C33.

Ideally, each component should have the same reactance at the new frequency as it had at 70MHz. So, if you wanted the receiver to cover part of the 50MHz band, then you'll need to increase the value of both the coils and the capacitors by a factor of 70/50. It won't (usually) be possible to get the inductance and capacitance exactly right, but it'll give you a good idea of what to aim for.

I have seen the SA602A used on the 144MHz band but I wouldn't recommend it to beginners. Oscillator stability becomes much more of a problem, and a slight modification has to be made to the circuit.

All the changes needed to cover different bands are associated with the SA602A, so it's possible to make up individual front-ends on small pieces of copper-clad board. The outputs can then be switched (either mechanically or electronically), or each front-end module could be connected to the i.f. stage with a plug and socket arrangement. It's all very reminiscent of changing bands using plug-in coils!

Dual-Conversion Modification

As I've clearly stated...although it works, the receiver is both insensitive and suffers from image problems (don't we all). With the addition of a second SA602A (I've called it IC6), a 10.7MHz ceramic filter and a few other components, the image problem can be largely overcome. And the sensitivity helped a little, too.

The 'new' second mixer/oscillator is shown in Fig. 5 page 31, September issue. It's wired between the output of the first SA602A and the 455kHz i.f. filter. I built the additional circuitry to the side of what I'd

Modifications

already constructed, so converting the existing design to dual-conversion was very easy.

This time the SA602A Colpitts oscillator uses a 10.245MHz crystal and no adjustments are needed. Again, I took the output from pin 4, so keeping the signal path clear of the l.o. It helps to mount IC6 the 'other way around' as compared to IC4 and IC5 (see photograph).

You will appreciate that it is the 455kHz filter which determines the bandwidth of our receiver. In Fig. 5, the job of the 10.7MHz filter (XL2) is to simply reject the new image frequency, so its pass-band can be quite large.

I used a muRata SFE10.7MJA10-A filter which has a bandwidth of 300kHz, although any similar 10.7MHz ceramic filter will probably work just as well. Ideally, a narrower filter is better, say 30kHz. But don't go lower than this.

The purpose of the 430Ω resistor is to provide the filter with the correct load impedance. As I've said, both the input and output impedance of the SA602A is 1.5kΩ, but the impedance of the 10.7MHz filter is only 330Ω. I made no attempt to match the input side of the filter...but it's worth providing a good match on the output side.

You may ask... "Why not 330Ω rather than 430Ω"? In answering, all I have to say is...remember the SA602A's 1.5kΩ input impedance - that's in parallel. So, 1.5kΩ in parallel with 430Ω gives 334Ω. (Close enough, I'm sure you'll agree!). The 10nF capacitor is simply a d.c. blocking capacitor.

Input & Output Matching

Something I haven't tried is matching both the input and output sides of the 10.7MHz filter using tuned circuits. This is the proper way to do things but it does need two (identical, as it happens) tuned circuits as shown in Fig. 6. Rather than use tapped coils, it's easier to use two capacitors in series.

The ratio of the capacitors gives the required impedance transformation while their total (series) capacitance forms a resonant circuit with the 10μH inductor. Naturally, if you try this arrangement, the 430Ω resistor and 10nF capacitor shown in Fig. 5, are not required.

Whatever matching method you choose,

the l.o. in Fig. 4 now needs to run 10.7MHz lower than the receive frequency. I managed to squash L3 enough for the l.o. to cover the required range with C33 almost fully enmeshed. If you're not so lucky, try an extra turn on L3 and adjust its length to give the required coverage with C33 half to three-quarter enmeshed.

To be clear on what frequencies we're after, let's run through all the frequencies associated with a received frequency of 70.450MHz; the f.m. calling frequency.

The input tuned circuit - L2/C26/C27 - resonates at the receive frequency, so that needs peaking at 70.450MHz. When using the single conversion arrangement, the l.o. tuned circuit - D1/D2/L3/C30/C31/C32/C33 - resonates at 70.450MHz minus 455kHz, which gives 69.995MHz. The image frequency is 455kHz below this figure - at 69.540MHz - so you'll hear any transmission on this frequency as well.

Front-End

With a dual-conversion arrangement, the receiver front-end is still tuned to 70.450MHz of course, but things now get slightly more complicated. The first l.o. runs at 70.450MHz minus 10.7MHz, which gives 59.750MHz.

In simple receivers such as ours, it's better to run the l.o. lower than the received frequency because the lower the frequency, the more stable we can make the oscillator. And yes, this receiver does drift (alarmingly!).

At least the image frequency is now well removed from the receive frequency; in fact it's 10.7MHz lower than the l.o. frequency, at 49.050MHz. Despite the large difference in frequency between our wanted frequency and the image, a strong signal on 49.050MHz will get through. Possible solutions are a proper band-pass filter on the input of the first SA602A, or a tuned pre-amplifier. The latter option is better, as a pre-amplifier will improve both the sensitivity of the receiver and help with image problems.

The second SA602A in our dual-conversion receiver takes the first i.f. of 10.7MHz and the 10.245MHz l.o. signal, and multiplies them together to produce our 455kHz second i.f. There will also be an output at 10.7MHz plus 10.245MHz - 20.945MHz - but we can ignore this particular mixing product.

PW

Construction Techniques for VHF Home-brew

Rob Mannion G3XFD provides some ideas, tips and advice for anyone new to home-brewing above 30MHz.

My first advice is that you should not be afraid of building equipment for v.h.f.. It's not dangerous...and it's great fun! Secondly, to help yourself I strongly advise you to try a few really simple ideas. However, in reality to achieve the best results you should have access to a grid dip (or gate dip) meter.

Ideally one of the smaller - quite basic - frequency counters would be helpful too. They're not expensive and they'll provide a read-out of the dip meter's frequency as a useful check (they'll be more on this subject in future Radio Basics columns).

Start off by making a simple v.h.f. tuned circuit using a self-supporting coil - find out where it resonates and note how easy it is to knock it wildly off frequency. Use the same techniques as can be seen in G4JCP's photographs. Keep all connecting leads as short as possible. The Copper Island technique (frequently recommended in Radio Basics) lends itself to low v.h.f. construction admirably as the connections to ground (earth) can be very short.

If you have a frequency counter (and I thoroughly recommend you buy one) a simple crystal oscillator operating on harmonics (using the tuned circuits you've made up using the dip-meter to check resonance) will prove ideal for training. I speak from experience!

I once made a lovely little 70.260MHz a.m. transmitter which worked first time! Unfortunately for me I hadn't allowed for stray circuit capacitance in the multiplier chain and I ended up much higher in frequency! I would have saved much time if I had followed the crystal manufacturer's instructions...and also used my dip-meter (which worked right up to 100MHz).

I shall be dealing with this subject in great depth very soon...but in the meantime I hope you get busy and start getting a little v.h.f. constructional practice in!

G3XFD



Jim Leigh looks back over the years to the days when he worked for a company specialising in making full use of war surplus equipment. Jim's article will bring back memories for anyone who built a TV receiver using a VCR97 radar tube!

At the end of 1949, on my release from the RAF, I rejoined Premier Radio at the factory in Clapton, in south east London. Naturally, the job which I had been doing before was now being done by somebody else, and I was taken into the development department (making three of us).

By this time, television fever was gripping everybody because of the re-starting of broadcasting,

(t.r.f.) receivers. There were four r.f. stages in vision and two in the sound, all using slug tuned coils, all of which of course had to be hand wound.

Double Deck Chassis

A double deck chassis was devised for ease of construction ... and to make it easier on the pocket. One large chassis formed the lower deck and held the mains transformer, rectifiers, etc.

similar tubes around with a yellowy trace giving a more acceptable still picture...they had longer persistence phosphor which left 'ghosts' behind for some seconds.

Those constructors who were better off could buy the complete kit including tube (there never was a cabinet) for 17 guineas*, the majority would buy one section every week or so! On some Saturdays, there would be queues at the shops in Fleet Street and Edgware Road with people waiting to buy the next part.

*A guinea, a clever method of extracting more money from the customer...was actually £1-1s (£1-05p).

Government Surplus

With the exception of metalwork, coils and mains transformer (all made in our factory) and the loudspeaker, virtually everything came from government surplus sales. These sales, held at various depots around the country, were to dispose of huge stocks built up by the services during and after the war.

Fortunes were made by some of the bigger buyers who were relatively few in number. They would get together before a sale to decide who would bid for what - and then meet again afterwards to divide the spoils.

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Due to the large number of orders in hand, coupled with supply difficulties, we are reluctantly compelled to temporarily close our Postal Service.
No post orders can be accepted until further notice.
Our Technical advice and service departments remain in operation. Resumption of Postal Service will be announced in these columns.

Fig. 1: The advert from the August 1951 issue of *PW* was typical Premier promotion of the period. But as television fever was gripping everybody the company decided to introduce a television receiver kit.

albeit on a very limited scale. Because of this it was decided that we would add a television receiver to the other home build kits already produced. The advert, **Fig. 1**, from the August 1951 issues of *PW* was typical Premier advert of the period.

Mounted above the large chassis, each using its own separate chassis, were the vision receiver, sound receiver and time bases. These bolted together into the same

Back to the bench... at premier

My main functions then became the making and testing of prototypes and subsequently the 'proving' of instructions, etc. This was achieved by building models working entirely to the instructions intended for publication and with the components supplied.

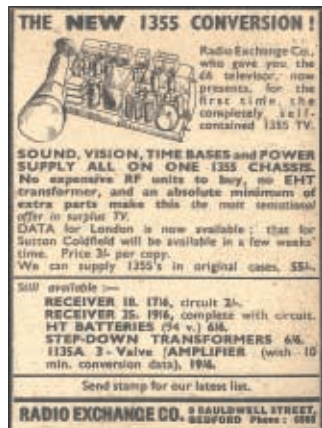
For ease of alignment, the TV kits used tuned radio frequency

size as the power supply with the cathode ray tube (c.r.t.) tube sitting up on top of the whole lot.

The 'tube' used was the VCR 97, as featured in a rival's advert in **Fig. 2**, (from the January 1951 *PW*) which used the R1335 receiver. The VCR97 was a 6in diameter type using electrostatic deflection and had a green trace. However, although there were

All these lovely brand new components as well as complete equipment coming onto the market as low prices led to a large re-awakening of interest in home construction. The boom also led to the establishment of retail centres specialising in surplus equipment in London, particularly at Edgware Road, Lisle Street and Tottenham Court Road.

The glut of very cheap components also had its effects on our work in 'the lab'. The door would open and one of the firm's partners would rush in, just like **Worthington** the *PW* cartoonist suggests in **Fig. 3**, holding some strange valve - perhaps with no markings, an unknown service number or the



● Fig. 2: The cathode ray tube (c.r.t.) used in the Premier television kit was the VCR 97. This also featured in a rival's advert in the January 1951 *PW* which involved converting the R1335 receiver (see text).

like. He would ask..."Test this for me son (I'd been 'son' ever since I started there) and see what we can use it for, I can get 10,000 of them very cheaply!"

Kit & Completed

The domestic radio receivers which we produced in both kit and completed form used a metal oxide rectifier. They were formed from lots of coated discs threaded onto an insulated tube over 6BA studding which

The valve line-up of these also changed very considerably over this time. Most older readers will remember the EF50....there must have been millions of those marvellous valves. And apart from their use in the r.f. sections of the television receiver kit...they found their way into most everything else we did.

We soon learned that - by and large - component values were not as critical as we thought. If we had no 270Ω resistors for cathode bias on a valve, then 390Ω made very little difference. Whatever could be obtained through this surplus market was pressed into service!

The cost of the Magnetic kit (without tube or cabinet) was about 19 guineas and one of the highlighted features was a 'non-lethal EHT' supply. It was still a single station only of course, although we had long been producing sets of coils for far away places such as Holme Moss and Kirk o'Shotts.

Soon though, the advent of commercial television meant that anybody wanting to receive it needed a converter (usually external) and of course another aerial.

As can be imagined, some people who built the television receiver kits ("all you need is a screwdriver, pliers and a soldering iron" the advert said)

hours a day.

Imagine if you can the frustration at both ends of the line when somebody calls seeking help, and you suggesting things to try, he (I don't remember it ever being she) goes away - and comes back saying 'now it does' or 'it's just the same', and this exchange going on day after day. It could well be that some simply never worked, and it's probably a miracle that so many did!

Enter The 807!

Returning briefly to the government surplus supply side, the 'non lethal EHT' (extra



● Fig. 3:....."the door would open and one of the firm's partners would rush in holding some strange valve (perhaps with no markings, an unknown service number or the like) asking..."Test this for me son.....and see what we can use it for, I can get 10,000 of them very cheap".

radio

clamped them all together and provided a fixing method.

We then got a very large batch of metal oxide rectifiers which were too long to fit inside the cabinet. The solution was then to set a lad to work full time for weeks undoing one end and taking off a few discs. He'd then shorten the insulator, and replace the unit!

Magnetic Kit

Eventually, the supply of VCR 97 tubes began to dwindle. This was coupled with the fact that the commonly used 7

and 9in tubes were being ousted by 12in tubes in commercial receivers, which led to the decline of the kit market. So out came the new 'magnetic' kit. This would accept 9 and 12in tube (new, not government surplus). However, some surplus types were still available...but all had long persistence traces.

found to their surprise that they did not get a picture upon switching on! By now I had moved to the shop in Edgware Road (up on the 3rd floor) and if somebody came in with a query, I was asked to come down and speak to them.

The situation soon resulted in my losing a couple of stones in weight, and quickly into having a shop full of people with problems and no room for new customers. So we resorted to dealing with queries by telephone only. Even this sometimes tied up one telephone line (and me) virtually all day, and it was further limited to a couple of

high tension) receiver used the world famous transmitting valve 807 for the line output stage. And as a result these started to get scarce (probably Radio Amateurs were snapping them all up).

One day, the partner mainly concerned with valves came in with some good news - he'd bought some, all of them without top caps, just the wire sticking out at the top! The workshop lad was set to work again. He tested them, and those which worked had top caps (taken from large valve rectifiers) stuck on with glue and soldered to the wire end.

Those were the days! *PW*

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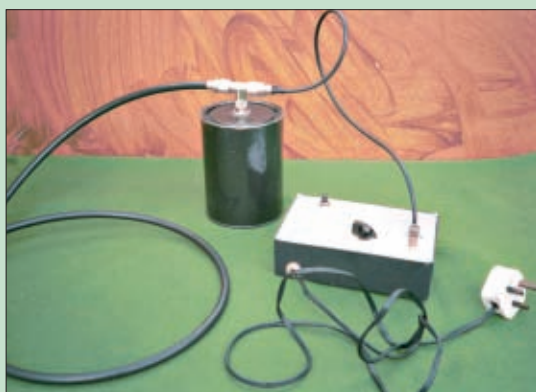
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Transceiver Performance - Simply Checked

Tony Martin
G4AYM, has come up with a way to put your mind at rest when the uncertainty "is my rig still working" strikes. Tony suggest, simple-to-construct test equipment can be very helpful!



The sophisticated design and manufacturing techniques used in producing modern Amateur Radio equipment mean that nowadays, probably the majority of amateur operators will be unable to repair their own transceivers. I wonder perhaps if it's this same modern complexity that also contributes to the increasing interest in vintage equipment?

In my opinion, those Amateurs who are predominantly interested in the operating side of the hobby, are less likely to possess a range of r.f. test equipment. They may perhaps, not even have the old-fashioned stalwarts of a signal generator and valved, or high impedance voltmeter either.

Whether your equipment's new, or rather long in the tooth, one of the drawbacks of not having test

facilities, comes when you have the horrible suspicion that something's not quite right, but you're unable to check it out. To this end, I'm about to suggest a couple of simple test units that can be used to perform an independent, easy check on receiver sensitivity and transmitter power output.

The basic idea, shown in **Fig. 1**, is designed to perform both measurements by connecting the appropriate test unit and the equipment under test, via a T-piece into the station dummy load. Both of the test units use the dummy load as part of an attenuator.

Noise Generator

In both test units, the dummy load forms the input resistor of a p-section attenuator. The receiver test unit, the upper part of Fig. 1, is simply a wide band noise generator. This creates a signal over the band of frequencies for the receiver and I'll describe its use later.

The transmitter test unit is a diode r.f. detector, which provides an indication of output power. The test provides merely an indication of output power, and to make a subjective test of the quality of transmission is outside the role of this simple tester. So, I'll ignore the truly subjective measurements for purpose of this article.

The only precautionary note, that you must heed, is to avoid putting a transceiver into transmit mode when the receiver test unit is plugged in! The units are used to monitor on-going

performance rather than to make absolute measurements, so that calibration is somewhat arbitrary.

An arbitrary calibration doesn't really matter for our simple test purposes. You either take initial measurements when the equipment is known to be working satisfactorily, or you can take measurements on comparative equipment.

Comparative Testing

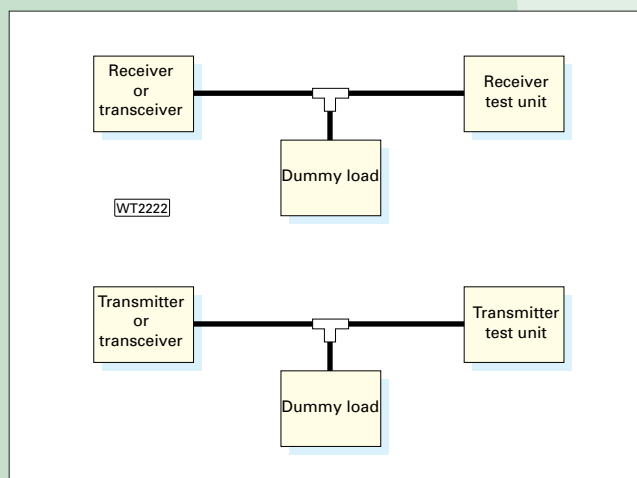
With the comparative testing method, you simply compare the readings against a similar, but known working model, as well as the suspect unit. In my experience this simple, stand-alone receiver test unit has proved a most useful and enlightening diagnostic tool.

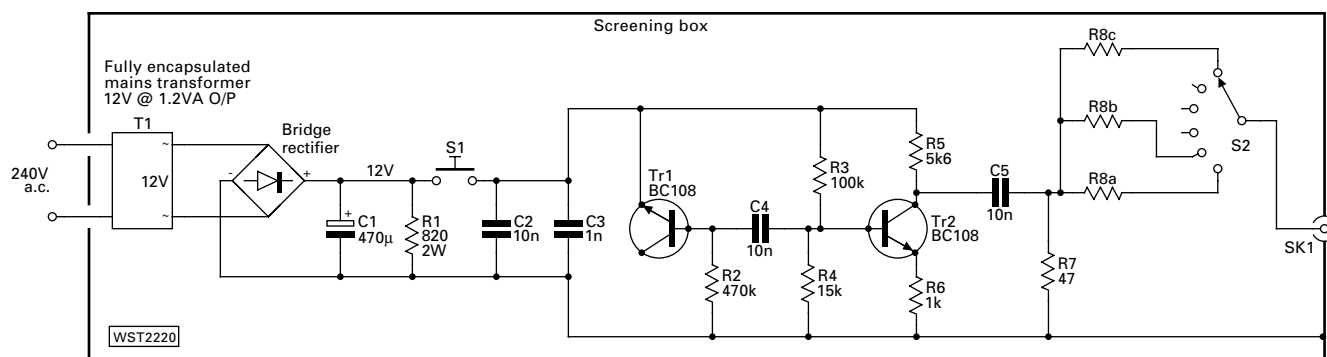
You should have little or no difficulty in making the test units, as construction is not critical. However, the usual rules for good r.f. practice should be followed, including the use of carbon resistors and disc ceramic capacitors at all coupling or decoupling points.

In particular, the noise generator circuit should be screened and decoupled from its mains power supply. The complete unit should ideally be built in a fully screened metal box.

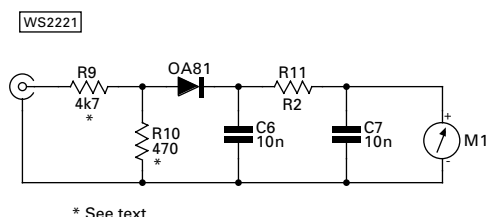
When building the transmitter unit, care should be taken with the attenuator resistors. As the resistors may have high r.f. voltages present at some points, care should be taken with the mounting and insulation of them. In view of the simplicity, practical

● Fig. 1: Simple tests may be carried out whenever, there's doubt about the workings of either a transmitter or receiver. For transmitter testing the dummy load must be able to withstand the full output of the transmitter.





● Fig. 2: A simple wide band noise generator can replace an expensive signal generator, for a confidence boosting tests of a receiver.



● Fig. 3: A simple power indicator. It's not fully terminated and so must be used with a short length of coaxial cable to reduce problems with mis-matching (see text).

details are left to the constructor's own choice. (My versions of the two units are shown in the heading photos.

Now let's turn to the actual circuits of the two test units. The circuit diagram of the receiver test unit is shown in **Fig. 2**. It essentially consists of a mains power supply, a wide band noise generator and the output attenuator. The mains power unit can be made up from individual parts or a 12V mains adapter can be used.

The noise generator itself uses a grounded-base transistor, whose emitter-base junction is reverse-biased so that it breaks down into avalanche mode. A single stage amplifier is used to raise the output level, which is then presented to the input of the attenuator.

Not Critical

The BC108 transistors shown in Fig. 2 are not critical and similar types, which are to hand, may be used. I used BC108s as I had them to hand. You can use any transistor that has a bandwidth somewhat greater than the maximum frequency you will be using with the test unit.

The output from the noise signal attenuator (connected to the T-piece on the dummy load) is most conveniently made from a short length of coaxial cable terminated in a PL259 plug. However, constructors might like to provide alternative connectors to the unit itself.

A rough calibration can be

made, (approximately in terms of dB, by marking up the switch positions according to the preferred resistor values of R1 shown in **Table 1**. **Note:** Since both of the terminating resistors of the π -section are fixed, being the 47 Ω in the unit and the 50 Ω dummy load, this calibration is only approximate.

In use, the transceiver/receiver is tuned to a quiet frequency, and the noise generator connected via the T-piece and dummy load. Then the push-button is used to inject noise, whilst the attenuator position is varied until the noise level in the receiver can just be heard. This can then be recorded as a reference point for that particular equipment and at a particular frequency.

The use of an ordinary, carbon resistor and a rotary switch in the attenuator means that the stray capacitance will upset the calibration as the receiver working frequency increases. So, remember that at v.h.f., this simple attenuator may not be so useful.

The circuit diagram of the transmitter test unit is shown in **Fig. 3**. It consists essentially of an r.f. voltmeter, sampling the r.f. level from a transmitter via a potential divider across the dummy load. The input for connection to the T-piece on the dummy load is again most conveniently a short length of coaxial cable terminated in a PL259 plug.

The OA81 diode shown in Fig. 3 may still be found as a surplus or junk box item,

otherwise any good r.f. detector diode can be used. It's a germanium device and has a low forward voltage drop, giving better readings at lower power levels. If replaced with a silicon diode (1N4148 etc), these readings may be less meaningful when low power is used.

Calibration Required

If calibration is required, then it may be carried out against another power meter. As a simple check unit, calibration is not essential, as long as typical meter readings can be used. Readings should be recorded as reference points for the transmitter(s) under test.

Table 2 shows approximate values for the set-up resistor to suit typical meter sensitivities and an assumed 100W transmitter.

The set-up resistor, R11, may be chosen differently to my recommended values shown in **Table 2** if QRP working is the main interest. You could, if you wish, use a variable resistor instead of a fixed value of R11 so that the nominal transmitter output may be set to produce

full scale deflection on the meter. You could also use a range switch to select differing values of R11, that are suitable for both full power or QRP transmitters.

When using the transmitter test unit, the transmitter or transceiver under test is tuned to a chosen frequency and the power meter connected via the T-piece and dummy load. **Note:** The meter readings will not show a linear response as power is increased from QRP levels, due to the relationship of voltage and power.

The forward voltage drop of the particular diode used in the transmitter test unit, will also make it more difficult to chart exact power on such a simple meter, especially at QRP level. You should record the meter reading at a particular frequency as a reference for that particular equipment.

So, there you have it, a simple way of reassuring yourself that your precious equipment is working as well as can be expected. Or of course it might show that further investigation is needed. But either way, you will have a result!

PW

Table 1

Attenuation (dB)	R8(a, b c...) (in Fig. 2)
10dB	68 Ω
40dB	2.7k Ω
50dB	8.2k Ω
60dB	27k Ω
65dB	56k Ω
70dB	82k Ω

Table 1: Changing one resistor, R8 in Fig. 2, gives a simple π -match attenuator when terminated with the 50 Ω dummy load.

Table 2

Meter FSD	R11 (in Fig. 3)
100 μ A	39k Ω
1mA	1k Ω
5mA	600 Ω
10mA	470 Ω

Table 2: Use the appropriate value resistor in place of R11 (in Fig. 3) to give approximately full scale deflection for a 100W r.f. output. For other output power levels, some adjustment of the values of R9/R10 (Fig. 3) will be needed.

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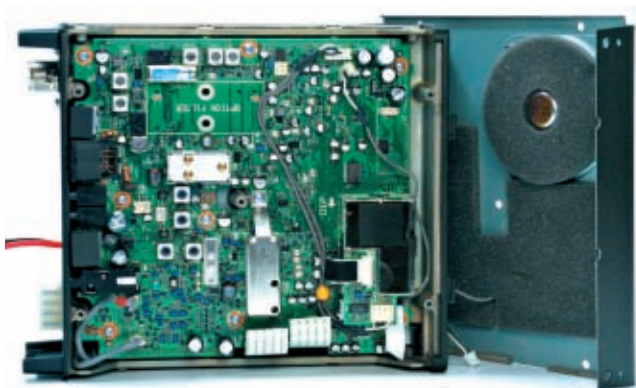


• The Icom IC-703 is - as indicated by the normal sized fountain pen - a small rig. But, as Neill Taylor G4HLX explains...it offers much more than you'd think and includes some surprising extras!

Icom IC-7

HF/50MHz Transceiver

The latest addition to the growing range of small h.f. transceivers is the little IC-703 from Icom. The transceiver is 'little' in the sense that it's lightweight, low power and physically quite small, as well



• An inside view of the IC-703 transceiver.

as being comparatively low cost. However, as I found out on the air, the IC-703 is certainly not a little rig when it comes to features, and holds up pretty well against 'the big boys' in transmit and receive performance!

The IC-703 easily-portable transceiver is bound to look attractive to those who like to take their Amateur Radio beyond the shack and the car. In particular I think it will appeal to 'back-packers', climbing to hilltops or other exotic locations on foot. It will also find a home in the shack of a QRP enthusiast, working fine as a base station, and in particular I think it will appeal to holders of a Foundation Licence.

What's In The Box?

Right...now I'll answer the question..."What's in the box for you?". On arrival you'll find that the IC-703, heading photograph, provides (in a box measuring about 220 x 170 x 60mm and weighing under 2kg) coverage of all h.f. bands plus 50MHz.

The transceiver has 10W transmit power output on s.s.b., c.w., f.m. or data modes, and 4W on a.m. It also includes a general coverage receiver with a tuning range from 30kHz to 60MHz.

Additionally, the transceiver

has a built-in auto antenna tuning unit (a.a.t.u.) and digital signal processing (d.s.p.) as standard. In short, add an antenna and a power supply or battery, and you have a complete and highly portable station. The optional carry bag makes this even easier.

In appearance, the IC-703 looks very like the older and well-established IC-706 series. In fact, the front panel is entirely identical with the IC-706 MkIIg (apart from the name IC-703!).

The functionality of these two transceivers is very similar, too, with the IC-703 menu system, etc., very much like that of its older cousin. However, there's no doubt that the IC-703 has been designed with portable operation in mind!

For example, the designers have worked hard keeping current consumption low to preserve battery life. Basing its functionality on the IC-706 seems like a good idea, given how popular the '706 continues to be, some eight years after the first model was launched.

As an all-in-one low power rig

for the QRP enthusiast or Foundation Licensee, the IC-703 seems to provide everything you need. Except that is....for coverage of the 144 and 432MHz bands. This is an unfortunate omission, in my opinion, although I'm glad they managed to squeeze 50MHz into the box though.

Neill Impressed!

I was keen to try out this little transceiver on the air, and when I powered it up for the first time I was at once impressed....it didn't have a 'small rig' feel or sound. Tuning in some s.s.b. stations on 14MHz, I found the audio through the internal speaker to be full and clear.

The large tuning knob is

The quality of the transmitted audio sounded good to me (I recorded this on a separate receiver). I also received several complementary reports of the audio quality from the stations I worked. The speech compressor provided a worthwhile increase in signal 'punch' without degrading the quality of the sound.

Using CW

Next, turning to c.w., where the full potential of QRP is to be realised, I found the rig to be quite capable. One of the optional c.w. filters would be necessary for serious c.w. operating, though, the options being 500 or 250Hz.

The built-in iambic keyer is very easy to use, I just plugged in my paddle and away I went. Various menu settings allow the keyer to be configured for personal preference.

It's even possible to set it to use the **Up** and **Down** buttons on the microphone in place of a paddle key! To my surprise I found this moderately easy to use, and it would be useful in an emergency, maybe, if operating portable without a key when the need to switch from s.s.b. to c.w. arose.

Either full or semi break-in, with adjustable delay, is available. The full break-in works well, and I could 'hear between the dots' when sending at speeds up to about 20w.p.m.

However, I was surprised to find that relays are used for the transmit-receive switching. And although they're not loud, I found the constant clattering quite distracting (I suppose I wouldn't have noticed it had I been using headphones). But the semi break-in, with a short delay time, suited my operating style nicely.

The c.w. keyer also features three message memories. These are not loaded with a message using your key, but by a fairly complex operation using the menus.

Having programmed-in your three messages, it's then easy to send them with a single button press. One of the three messages can be used to send a report and contest serial number, which automatically

increments each time it's sent.

This is all very clever, but I think it would only be useful for rather casual contest operating.

For serious contesting, automation of serial numbers, etc., is bound to be done by your logging software running on a PC. Interfacing this sort of thing with the IC-703 is enabled by its Icom standard CI-V computer interface (an optional level converter is needed to connect it to a RS-232 port on the computer).

The FM Mode

The f.m. mode, while not essential for h.f. operation, is properly supported by this transceiver. It has a CTCSS tone encoder and decoder, as used to access many v.h.f. repeaters.

The transmit frequency offset for a repeater has to be set up using the split function, and then the combination can be stored in a memory, complete with the tone frequency. It seemed a bit odd to find all this in a transceiver without 144 or 433MHz capability.

Tuning & Controls

The main tuning dial is smooth, and in s.s.b. and c.w., a 10Hz tuning step



● The detachable main front panel (see text).

comfortable, although there are two settings of dial tension, and I would have preferred the lighter one to be slacker for more of a spin. The menu system is easy to access, and I could guess what many of the items did before delving into the manual.

The receiver does seem to have good sensitivity. On 50MHz I used it to listen to a beacon which is marginal at my QTH. Comparing the IC-703 with my other 6m band receivers I found it to have quite acceptable performance, and I would have been happy to use it for DX work on this band.

I was then ready to do some transmitting, so I thought it was time to open the manual and have a read. The description of getting started all seemed a bit long-winded, but would probably be quite helpful for an absolute newcomer.

Anyway, I soon found how to adjust the microphone gain and audio compression level for my voice (the initial settings were, in fact, just right). I also learnt how to use the automatic a.t.u. (a.a.t.u.), which was simple: **just press the button!**

I was soon enjoying a string of QSOs on 14MHz s.s.b. I was reminded, once again, that plenty can be achieved with just 10W output power, provided you're not too ambitious.

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2 watt twin band mini handy



accessories

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NEWSFLASH

The New Icom Flagship. The IC-7800 was among many new products announced at Dayton this year.
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od, Yaesu, Oregon Scientific, bhi Ltd, Watson, Diamond and many more!

- The main battery pack (see text) and power supply...clearly proving how small the IC-703 is! The inset photograph shows the adaptor units for use internationally.



is standard, although a very fine 1Hz step can be set with a single button press. Faster rates can be set according to your preference, and a menu option gives you a quarter-speed slow tuning rate.

A nice feature (which I didn't see mentioned in the manual)...is that if you spin the dial fast enough it switches to a quicker tuning rate to rapidly QSY. Band Up/Down buttons move sequentially through all the Amateur bands from 1.8 to 50MHz.

The buttons also select the general coverage receiver, which appears in the sequence at the appropriate position, depending on the frequency that you last left it. For example, I tuned it to one of the experimental 5MHz frequencies and when switching up through the bands 60m appeared between 3.5 and 7MHz (but of course the rig cannot transmit on 5MHz).

There are two v.f.o.s on the IC-703 with the usual ability to operate 'split' (transmitting on one and receiving on the other). Although setting up the split frequencies is easy on the IC-703, I particularly liked the 'quick-split function'.

Having previously defined a split offset via a menu setting (I chose 5kHz), the split can be set

up practically instantly by pressing the **SPL** key, assuming you have the right menu showing at the time. So, if you are waiting to get through a pile-up when the DX station suddenly says "I'm going split - listening 5 up"....you can be first in the queue on his new receive frequency. (You and all the other IC-703 owners, of course!)

Memory Channels

The IC-703 has 99 memory channels, and I found them very easy to set and to use. Frequency and mode are stored, and if split operation is selected, the independent transmit and receive frequencies are stored.

There are three further pairs of memories that can be used to store scan edges. As well as v.f.o. scanning, a scan the through memory channels is easy to run, with individual channels skipped from the scan if desired. All the usual scan options are available, utilising the all-mode squelch to search for a busy channel, for example.

In addition to the 99 memories, there's also 'memo pad', in which a single button press stores the current frequency and mode in a rotating bank of five memories (it can be

increased to ten via a menu setting). This is very handy when tuning the band in the 'search and pounce' mode, when you hear a station who you want to work, but who is busy or has too many callers. All you do is pop the frequency in the memo pad and come back to it later.

Portable Power

As I mentioned before, the IC-703 is predominantly a portable rig and can operate on a supply voltage between 9 and 15V. Because of this flexibility a variety of battery supplies would be suitable.

Icom offer a 9.6V 2.8AH NiCad pack as an option, and I found this to be effective. I didn't operate long enough to flatten this battery between charges, but I would expect a few hours operation to be possible at normal transmit/receive time ratios.

When the rig detects that its supply voltage is 9.6V, or anything below about 11V in fact, a range of power-saving features switch in automatically. The maximum output power drops to 5W and the backlight of the main l.c.d. display switches off when no control has been touched for a few seconds.

Other power saving features can be selected by the menus, including a **Power Saver** when you're receiving with the squelch enabled (it's similar to this kind of function found in v.h.f. hand-helds).

When operating from a 9.6V supply, I measured the current consumption to be about 300mA when receiving a signal at a comfortable audio level, and 1.7A for 5W continuous power output (rather less on average in s.s.b. use, of course).

In fact, the figures I've quoted are quite low compared with many amp-guzzling radios. This suggests that considerable design effort has gone into optimising the IC-703 for battery use.

Unexpected Extras

Now on to some of the 'extras' that are featured in this transceiver which you might not expect in a basic modestly-priced rig. And I'll start with the i.f. shift control.

The control enables the i.f. pass band to be moved up and down in frequency when s.s.b. or

c.w. modes are used. This can be useful to avoid problems from strong signals on adjacent frequencies. In c.w. use, since I didn't have one of the optional narrow filters, I found this shift control very useful to eliminate other c.w. signals nearby the one I was listening to.

The other 'extra' - the DSP - provides just two functions: On s.s.b. an automatic notch filter can easily be enabled that searches for constant tones and notches them out. Thus heterodynes from extraneous sources can be eliminated, and I found that it works well.

When you're using s.s.b. or c.w., the DSP noise reduction can be switched in. This removes much of the noise content of the audio signal, and certainly provides a marked change to the quality of the sound.

In use...with many s.s.b. signals of modest strength (when there's a significant background noise level) I found the facility definitely makes the speech sound as though it has better fidelity. But whether or not it made it more intelligible...I'm not sure. I found many signals that the noise reduction made 'nicer' to listen to, but despite trying hard...I couldn't find any signal that became readable with the noise reduction, but unreadable without it.

Another 'extra'...the a.a.t.u. is a **very useful device** to have built in to the rig, especially for portable use when it's necessary to sling up a temporary antenna. But remember...it's not designed to match a very wide range of impedances, so you can't just plug in a random length wire and expect to get a match on all bands.

However, although Icom offer an optional external a.a.t.u. with a wide range capability, the internal one is specified as being able to match loads up to a v.s.w.r. of 3:1 (a little less on 50MHz). And to see what this means in practice, I first put up a dipole cut for 14MHz.

The a.a.t.u. easily matched the antenna not only on 14MHz, but also on 7, 18 and 21MHz too! Of course, just because a match is achieved doesn't mean that power is effectively coupled to the antenna, nor that the antenna is efficient. But it's a start. Next I tried the a.a.t.u. on my dipole cut for 7MHz. To my surprise it could match this on all nine bands 1.8 to 28MHz.

Data Modes

Data modes are well provided for, although I was not able to test these functions in the time available. The RTTY mode seems well thought out and it should be easy to connect to a terminal unit.

I was surprised to find the facility for connecting a TNC for packet operation at not only 1200 baud...but also 9600 baud, the bandwidth of which must surely be out of the question on the h.f.



- The carry-bag, which is shown modelled by Katherine 2E1HFX in true back-packing style. The remote front panel is accessible in its own pouch attached to the waist strap (see text).

bands. (Perhaps it's intended for operation with a transverter for v.h.f. or u.h.f., although this would seem to go quite against the all-in-one nature of the IC-703).

Instruction Manual

The instruction manual provided with the transceiver is far from optimum, in my opinion. There's a lot of repetition, and finding out about the operation of a specific function can take a lot of searching. There is no index, which would have helped to resolve this.

However, the most serious fault is that the manual contains a number of errors. Different modes of operating are covered in sections such as 'Operating FM', under which all the main features for this mode are explained. But, for example, on this page it lists "convenient functions for receive" including i.f. shift, noise reduction and auto notch filter. But in fact...none of these are available when operating f.m., as is made quite clear elsewhere in the manual!

On almost every mode

covered, there's a description of one or more features that are not actually available in that mode.



- Another way of using the IC-703 in its optional carrying bag, which also holds the battery pack. Ideal for picnic-style operation!

The exception is s.s.b., where the list seems accurate.

An experienced operator will not be bothered by the manual errors, but it seems to me that since the IC-703 is likely to appeal particularly to newcomers with

Foundation Licences, it is regrettable that these mistakes have been made.

Much Admired Bag!

Finally, I have to admit to being most surprised at how much I

admired one of the optional accessories for the IC-703...the carrying bag! It's an extremely well thought-out backpack-style bag (see photos), which can hold the rig, battery and accessories, with space for log book, fasteners for antenna poles, etc.

The carry-bag seems tough and is comfortable to wear. A separate small pouch is provided for the removable front panel of the transceiver. This,

in common with some mobile rigs, can control the transceiver remotely at the end of an extension cable (another optional extra).

The pouch fixes to the waist belt, so the rig can be operated while in the bag on your back when (for example) in use with a whip antenna. And...if it starts to rain a pocket on the top of the bag can be opened to pull out a waterproof cover which slips over the entire carrying bag.

The instructions that came with the bag include some rather odd translations from the Japanese! And the authors don't confine themselves to explaining how to use the bag...but also touch on some more fundamental aspects of portable operation.

One sentence was most amusing, and it's my favourite! It says...*"When operating condition is no good, changing operating place may help clear operation"*. Profoundly true, if I've understood it correctly!

The thought that has gone into the design of the bag confirms my view that the IC-703 is intended primarily as a portable rig. The fact that the transceiver provides features that are valuable in a base station, and gives a respectable transmit and receive performance as well, is a bonus.

The omission of v.h.f./u.h.f. capability, while understandable in a rig of this size, is the only aspect that may lead a new Foundation Licence holder to consider the alternatives. However, as a complete all-in-one portable h.f./50MHz rig, the IC-703 has a lot to recommend it. *PW*

Icom UK reply to comments on the IC-703 made by Neill Taylor G4HLX

Dear PW - Thanks for the positive and thorough review of our latest rig and the opportunity to respond to some of the issues raised in the review.

The reviewer states that there is no index in the handbook. We would like to point out that there is a comprehensive Table of Contents section which clearly guides the user to specific areas of the manual. Regarding the section 'Convenient Functions to Receive'. We realise that the inclusion of this in each operating section is a quirk of our Japanese cousins. The only thing that is misleading is the reference to i.f. shift. We will point this out to Icom Inc. and hopefully this will be removed from future versions of the manual.

**Ian Lockyer MA DipM MCIM MIDM
Chartered Marketer
Marketing Manager
Icom (UK) Ltd.**

Product

Icom IC-703

Company

Icom (UK) Ltd.

Contact

(01227) 741741

Pros and Cons

Pros:*"when I powered it up for the first time I was at once impressed....it didn't have a 'small rig' feel or sound....."as a complete all-in-one portable h.f./50MHz rig, the IC-703 has a lot to recommend it....I have to admit to being most surprised at how much I admired one of the optional accessories for the IC-703...the carrying bag! It's an extremely well thought-out backpack-style bag*

Cons*"the manual contains a number of errors....". "The omission of v.h.f./u.h.f. capability, while understandable in a rig of this size, is the only aspect that may lead a new Foundation Licence holder to consider the alternatives".*

Price

IC-703 £703.53

LC156 Carry case £62.06

BP228 Battery pack £71.76

Charger for Battery pack

£67.00 approx

all prices include VAT

Summary

"The IC-703 easily-portable transceiver is bound to look attractive to those who like to take their Amateur Radio beyond the shack and the car.....it will also find a home in the shack of a QRP enthusiast".

Contact

Icom (UK) Ltd.,

Sea Street,

Herne Bay, Kent CT6 8LD.

Tel: (01227) 741741,

FAX: (01227) 741742.

Carrying On The Practical Way

This month the Rev. George Dobbs G3RJV suggests that we try "A Little Regulation.... Using voltage regulator chips". But of course...these chips are best enjoyed with the quotation and not salt and vinegar!

"If we knew what we were doing, it wouldn't be called research, would it?"

Albert Einstein

Quite often in radio frequency (r.f.) circuits, the need arises for a stabilised voltage, i.e. - a voltage that will not fluctuate under operating conditions. This would be a

normal requirement for an r.f. oscillator when frequency stability is important.

In my early days of Amateur Radio, the valve transmitters we built were almost expected to drift in frequency in spite of using gas filled voltage stabiliser valves. Thankfully, these days it's not difficult to supply a circuit with a constant voltage.

For many years we used zener diodes to stabilise voltages and in fact...many circuits still use them. In practice, a zener is a type of diode used in voltage-limiting circuits: when the voltage reaches a certain value, the device becomes a conductor, adjusting the current flow to try to keep the voltage across it constant.

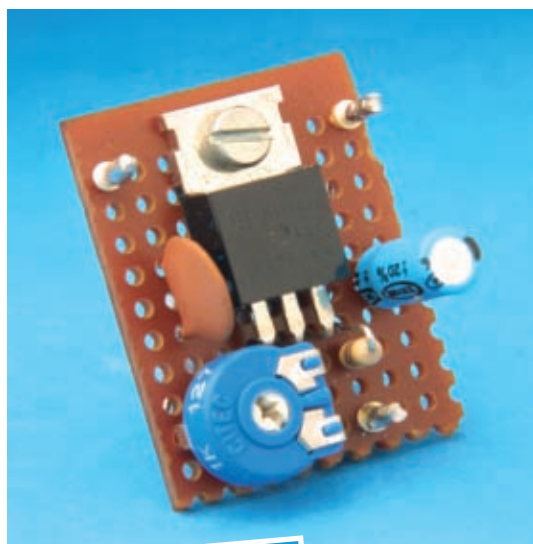
In practice zener diodes are supplied for specific voltages. The end of the zener diode with the ring marking goes to the positive (the wiggle line or the bar against the arrow head line on the circuit symbol) side of the circuit.

Typical Circuit

A typical circuit for zener diode stabilisation is shown in **Fig. 1**. The zener diode (ZD) requires a limiting resistor (R1) to supply the stable voltage to the circuit load (RL). The value of R1 is worked out from the simple formula: $R1 = [V_{in} - V_z] I$.

Where V_z = Zener Diode Voltage, I = Current through R1, V_{in} = Input Voltage. In practice 'I' should be the maximum planned current. The current is shared between ZD and R1 according to the load applied.

For example: if you have a 12V supply which is to provide 9V for another circuit at a maximum current of 50mA...it will require a 9V zener diode and a limiting resistor (R1) of 60Ω. The zener diode must have an appropriate power rating. This can be calculated from:



● This month G3RJV discusses the use of regulator chips...after you've read the quotation!

$$P_z = V_z \times I_L$$

Where V_z = Zener Diode Voltage and I_L = Maximum Load Current.

Note: Be conservative in the calculations above! Use the maximum

projected load to work

out R1 and the safest power rating for the zener diode.

Three Terminal Regulators

Although the zener diode is an easy way to provide a stable voltage, in recent years they have been replaced by the use of three terminal voltage regulator chips. This type has become an almost universal choice.

As suggested by the name, three terminal regulators are supplied according to the voltage and current required. The markings on the device show their use as can be seen in **Table 1**.

Examples:

LM78L12 = 12V, 100mA regulator

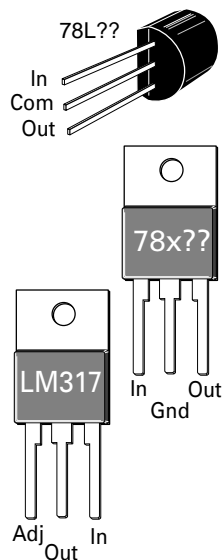
LM7805 = 5V, 1A regulator

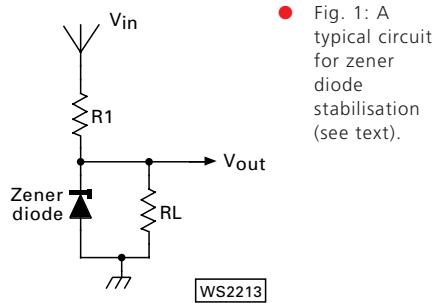
The smaller 78L range is usually in a TO-92 case and the 78 range is usually in a TO-220 case. Pin connections are also shown in Fig. 2. The 78 series and 78T series devices require a heat sink to be used up to their full current rating.

There's also a range of negative voltage regulators that have the designation 79 rather than 78 but their pin-out is different to the 78 series!

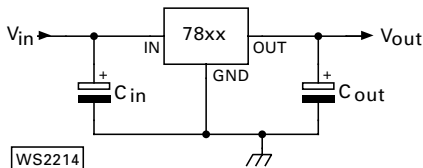
Simply Wired

The regulators may simply be wired into the circuit at the required place to provide a stable voltage. The input and output capacitors (C_{in} and C_{out}) shown in

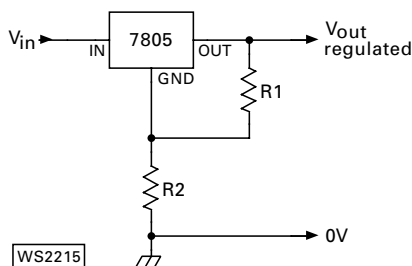




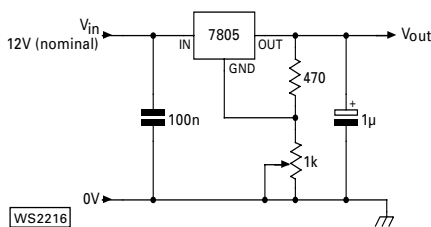
● Fig. 1: A typical circuit for zener diode stabilisation (see text).



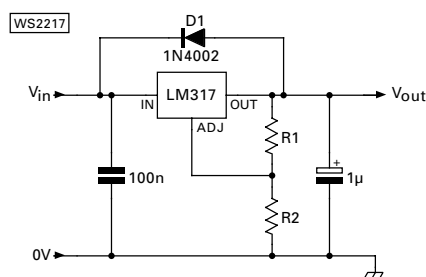
● Fig. 2: The 3-terminal type of regulator i.e. These pin-outs are referred to as Input, Output and Ground. The diagram shows the basic circuit for using a three terminal regulator from the 78 series of chips (see text).



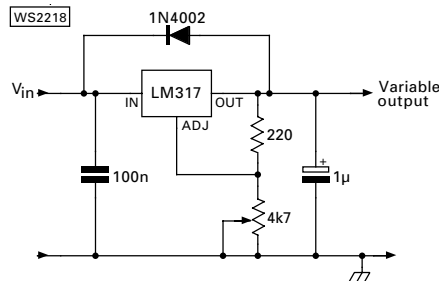
● Fig. 3: Although the 78 series of voltage regulators are each supplied to produce a specified voltage, it is possible to make them variable devices. This is achieved by adding two resistors, as shown (see text).



● Fig. 4: The diagram shows a very useful little board G3RJV made up using a 7805 regulator to produce a variable supply from a 13.6V supply or a car battery. Using the values shown, a nominal input of 13.6V can produce a stabilised output in the range 5 to 12V (see text).



● Fig. 5: Variable voltage regulators are also available, the most common of which is the LM317. The basic circuit for which is shown here (see text).



● Fig. 6: A practical application of the LM317. The input (Vin) is an unregulated d.c. voltage of up to 35V (see text).

Fig. 2. are optional. The capacitor C in is useful if the regulator is far away from the power source and a value of 100nF (0.1µF) is commonly used.

Note: Cout may help to alleviate spikes on the output of the chip and a value of 1µF is often used. If used, both capacitors should be soldered as close to the pins of the chip as possible.

The maximum input voltage the 78 series of regulators can handle is about 35V and needs to be a little higher than the output. In practice this requirement depends a little on the device but a good rule of thumb is that the regulator will require a minimum input voltage equal to the specified output voltage plus about 2V.

Variable Regulation

Although the 78 series of voltage regulators are supplied to produce a specified voltage, it's possible to make them variable devices. This is achieved by adding two resistors, as shown in **Fig. 3**. The regulators will supply stabilised voltages above their nominal value. (Fig. 3 shows the use of a 7805, 5V regulator, chosen because of its low voltage).

Because the voltage across R1 is always constant, a constant current will always be seen between the 'out' and 'ground' pins. This constant current, plus the regulator standby current, will also flow through R2 regardless of its value.

A voltage will appear across R2, which added to the 5V across R1, will give the total voltage between the output and ground. By changing the value of R2, a desired voltage may be produced at the output.

The minimum available voltage will be 5V and the maximum about 2V **less than the input voltage** (Vin). This follows the formula:

$$V_{out} = V_{fixed} + R2 (V_{fixed}/R1) + I_q$$

Where V fixed is the specified regulator voltage and Iq is about 2.5mA for the 7805 device.

George's Useful Board

The diagram, **Fig. 4**, shows a very useful little board I made up using a 7805

regulator to produce a variable supply from a 13.6 volt supply or a car battery. Using the values shown, a nominal input of 13.6V can produced a stabilised output in the range 5 to 12V.

The 'George Board'* is a handy little circuit to have around the workshop to obtain lower stable voltages from a 12 volt bench supply. It could also be used to power lower voltage equipment from a 12 volt socket in a car.

***Note:** George is a modest man...the appropriate title can be blamed on me!
Editor.

Variable Regulators

Devices specifically designed to be used as variable voltage regulators are also available, the most common of which is the LM317. The basic circuit for the LM317 variable voltage regulator is shown in **Fig. 5**.

As the Fig. 5 circuit suggests, it uses the same method of variable regulation as shown with the 7805 in Fig. 4. In reality the

Positive three-terminal voltage regulator markings

yy 78z xx		
Manufacturer LM = National MC = Motorola AN = Panasonic	Maximum current 78L = 100mA 78M = 500mA 78 = 1.0A 78T = 3.0A	Output voltage
		05 = 5V
		06 = 6V
		08 = 8V
		09 = 9V
		12 = 12V
		15 = 15V
		18 = 18V

● Fig. 6: A practical application of the LM317. The input (Vin) is an unregulated d.c. voltage of up to 35V (see text).

LM317 is nothing more than a fixed voltage regulator with an output of 1.25V.

The diode across the regulator is an optional extra added to protect the device from possible reverse voltages. When the supply is switched off, the output voltage should fall faster than the input voltage. If it does not, the diode offers protection.

The diagram, **Fig. 6**, shows a practical application of the LM317. The input (Vin) is an unregulated d.c. voltage of up to 35V. I have a bench supply that uses this circuit with the input supplied by a 20V transformer, bridge rectifier and smoothing capacitors, to provide me with a 2-18V regulated supply.

Finally for this month...if you've not already done so, I suggest you try three terminal regulators. They're easy-to-use, rugged devices with current limiting and thermal shutdown which makes them almost impossible to destroy. Ideal for our purposes!

Keen rally fan Ian Brothwell G4EAN enjoys buying second-hand equipment. He says that - with care - you could end up with a real bargain!

For some people the term 'second-hand' is synonymous with 'second-rate' and they often compare the poor image that second-hand cars and second-hand clothes had in the past. However, I've successfully bought and sold equipment second-hand and now have the station I want at a price I could afford and I certainly do not regard any of my purchases as 'second-rate'.

The idea behind this article is to allow me take you through the *Brothwell Guide*. This covers the 'Why, Where, What, Who, How and When' guidelines which I use when buying and selling in the second-hand market for both Amateur radio and photographic equipment. They work for me and I hope they'll work for you!



• Even though *PW* readers have found the annual Dayton HamVention in Ohio, USA, to be a good source of second-hand equipment...Ian G4EAN says you don't have to go that far to find the bargains!

answers are usually either to finance newer equipment (brand new or second-hand itself) and

useful an external v.f.o. is on a transceiver. Incidentally, newcomers to

Buying Second

- It Need Not Be Second Rate!



• Another source of second-hand equipment can be from Silent Key sales. Very often the bereaved family rush into dumping what they think is rubbish - but with the help of the local club...fair prices can result in everyone being satisfied. The end result being that the family are surprised at 'rubbish' raising money...with the Amateurs being pleased at the bargains!

Why Second-hand?

Firstly...why buy or sell second-hand equipment? In replying to this question - When buying, the usual answer will be is "price". Older equipment is usually worth less than its successors because it seems bigger, less flexible and less desirable by comparison.

But when selling, the usual

make room for it in the shack. Or it can simply be to turn disused equipment into money.

Looking into it further there are other perfectly sound reasons to buy or sell second-hand. To illustrate the reasons let's imagine a station line-up such as an h.f. transceiver with matching antenna tuning unit (a.t.u.), external v.f.o., transverter, speaker box and monitor-scope...all of which are now out of production by the manufacturer.

If one item 'died' the owner might turn to the second-hand market to buy a replacement or to sell the remaining items to finance a more modern transceiver. Of course, modern transceivers can provide most of the functions of this line-up in one box....and often in a very compact box.

Selling the line-up might prove popular with someone who owns the same model of transceiver. They may not have bought the matching line-up when it was available new, or have only now realised just how

Amateur Radio should note that unlike current-day rigs, many older transceivers had only one v.f.o. The user had to buy an external unit in order to operate split-frequency.

Buttons & Menus

Some people don't like equipment controlled by buttons and scrolling menus. They prefer 'old-fashioned' equipment where each knob or button had only one function - and the handbook was used mainly to stop the shack table from wobbling!

These people much prefer to use equipment from an earlier era - and who can blame them? One attraction for me in doing this, is that equipment I'd like but cannot currently afford will with patience and time...turn into the second-hand bargain that I can afford!

I'm happy to choose my ideal equipment and then wait until the ageing process makes it affordable for me. And here's an additional point...surely there's a virtue in keeping a complex piece

of equipment such as a radio away from the dustbin for as long as possible?

Many separate resources went into making that second-hand radio you'll see on offer. And from my point of view it seems a shame to waste perfectly good equipment by throwing it away when it might have years of useful life left.

Where To Buy & Sell?

So, just where can you buy and sell second-hand equipment? In answering, five possible suggestions come to mind. These include dealers, Bring & Buy stands at rallies, classified adverts, the Internet and friends.

Buying from a Amateur Radio dealer has its advantages. They will usually offer a

attractively priced equipment which is not second-hand. They may offer new equipment at a discount because it's 'end of line', has been superseded, has been on demonstration, is shop-soiled or is missing its box. The discount might be augmented by offering some optional extras (perhaps power supply or microphone or a.t.u. or antenna) at no extra cost.

The Bring & Buy

Another popular place is the Bring & Buy (B&B) stand at rallies and shows. And when selling here, you book in and leave your old equipment while you look around the rally for bargains. Hopefully, when you return to the B&B stand, you'll find that your old equipment has been turned into money (minus



• Even the smaller rally will probably have a Bring & buy stand. This one seems to have an interesting example of a late model KW linear on offer.

nd-Hand?

guarantee and will usually have a workshop in which to test the equipment prior to selling it on to a new customer.

Most of the dealers have been in business for some time, they want to stay in business and have good reputations to maintain (and you can ask around to see if the reputations are deserved). Offsetting this, there may be other places (see later) which offer equipment at lower prices but usually lack some or all of these advantages.

Different dealers approach second-hand equipment in different ways. For some, second-hand equipment is the mainstay of their business, for others, second-hand is merely a way of encouraging customers to 'trade-up' to the newest equipment.

Selling equipment outright, for cash, to dealers is a useful way of turning equipment into money quickly without the worry of supplying after-sales service...or bouncing personal cheques! There's also the advantage that any faults in the equipment will be dealt with by the dealer and not the original owner.

Dealers sometimes offer

the commission charged by the organisers) to offset the spending you've just done.

When buying, visit the B&B every hour (or half-hour if you're keen) and you may see new arrivals of equipment just as it's displayed. In fact...some keen B&B types never stray far from the stand!

For the buyer who doesn't know what they want to buy, the B&B stand can offer a lot of inspiration. But of course, there can be pitfalls for both seller and buyer.

For example, The seller faces the risk that their equipment may be dropped or stolen and the loss will be the seller's. On the other hand the buyer faces the risk that the equipment is often sold 'as seen' which means there is no guarantee it works.

The well-organised B&B stand will be staffed by people who treat every item carefully and it may even provide a test bench. This could include a power meter, dummy load and signal generator, so that equipment can be given a basic test to show it's working.

Of course, if faults are declared and prices are adjusted accordingly...then even

equipment in poor condition can be sold for repair or as a source of spares.

Classified Adverts

Let's now turn to classified adverts, which I think are great when the seller and buyer can meet in person. The equipment can then be examined and tested and - if a sale is agreed - money and equipment change hands at the same time.

However, if you and the vendor are at opposite ends of the country then the whole transaction has to proceed with much more caution. Personally, I prefer always to meet in person rather than to sell or buy at a distance.

Despite what I've just said...if you want an obsolete accessory, (e.g. an external v.f.o.) for your transceiver Classified adverts are the easiest way to find what's required. This is because a commercial magazine will be read by thousands of Radio Amateurs.

If you advertise with a 'Classified' someone with a suitable external v.f.o. tucked away in a cupboard may be stirred to dig it out and sell it to

you. So an item which was gathering dust in a cupboard once again becomes a useful part of someone's station. Great stuff!

Next there's the Internet...and I personally treat this method in the same way as classified adverts. It's a good way to find a potential buyer or seller but I would always want to meet in person before parting with equipment or money. If in doubt.... look before you buy or sell.

Do you remember the cartoon of a dog with her paws on a PC keyboard? The caption read "On the Internet, no one knows you are a dog"! It's best to be careful.

Friendly Market

Now it's time to look at my favourite way of buying and selling second-hand... with friends. I like the 'Friendly Market' approach because both sides benefit in comparison with most other methods of buying and selling.

With no third party involved the seller is paid more and the purchaser pays less. You'll also (hopefully) get an honest history of the equipment and can try it in your shack before deciding to buy.

A variation of the Friendly Market is the club Junk Sale. These are a good opportunity to clear the shack of stuff no longer in use, buy bargains you never knew you wanted, raise money for the club and even bring strangers into the club (if the Sale is publicised well enough).



- Together with the ubiquitous (and very popular) Bring & Buy stands at major shows and rallies...the 'outside' flea market type stalls can provide some excellent bargains. The example in the photograph is at Donington - the venue for the Leicester Amateur Radio Show.

Very often a club organised junk sale is a good way of disposing of a Silent Key Amateur's equipment. In this way fair prices can be obtained by everyone - which will help overshadow the reason for the event.

There's another variation of buying and selling through clubs and this is where specialist equipment, e.g. for datacoms*, is involved. So, why not contact the relevant national specialist interest group to see if you can place an advert in their

What Who & How!

Let's now look at what you need to know, how to find it and who to ask. And my advice - whether you are buying or selling - is that you need to arm yourself with information before venturing into the second-hand market.

Firstly, you'll need to find out what sort of price is appropriate for the equipment you want to buy or sell. You can get this information by browsing the adverts, looking

such like) take note of whether these are sold separately or as a line-up (reading the 'Wanted' adverts can help with this decision).

Let's suppose you want to buy an h.f. transceiver. And writing from my own experience...you may feel as though you're inundated with the current range of new transceivers. But this is nothing when you look to the second-hand market where you may find almost every h.f. transceiver made in the last 20 - 30 years!

If you think it is difficult to keep track of the differences between transceivers from

bands because these were not allocated to Amateur Radio until 1979.

Don't forget also that friends can be extremely helpful in finding out about models, variants and accessories. If your choice is a popular item then it should not be too difficult to find a friend who uses one and who will know of any problems. They'll let you try it out to see if you really like it.

Friends can also show you how to check whether internal extras (e.g. c.w. filters) have been fitted. You may find a friend who not only knows all the marks and variants but has the original



- Keen military equipment collectors will always find items of interest. Even an 1155 receiver (top centre) in 'Hedgerow condition' could be worth £20!



- If you do go to the USA...you'll see some spectacular collector's pieces! The object in the background (no - it's not a chrome-plated spare wheel!) is actually a Wurlitzer Juke Box!

magazine or web site?

**Note: Ian is too modest to mention he's one of the mainstays of the British Amateur Radio Teledata Group. (BARTG - very well known as 'Bartag'). Their own 'internal market' is very effective and reflects the keen interests of its members. Editor.*

on rally stands and dealers' shelves to get a feel for prices and demand.

If, for example, optional items such as c.w. filters or internal antenna tuning units (a.t.u.s) are fitted...make sure the prices take these into account. For external accessories (external v.f.o.s, speakers and

Alinco, Icom, Kenwood and Yaesu then the fun starts when you look at the all the FT-101 variants. First came the original FT-101, the 'B', the BMk2, the 'E', the 'EE' and finally the 'Z' and 'ZD' which came in Mk1, Mk2 and Mk3 variants (and this may not be a full list). Hopefully you'll get my point, realising that there's a very wide choice in the second-hand market.

Narrow Your Choice

To be practical you need to narrow down your choice. For example, if you want to get an h.f. transceiver then narrow down your choice to just a few models. You'll need to be flexible because it's not possible to know exactly what's available in the second-hand market.

Important Note: Please be aware that transceivers from the 1970s will often not have the 10MHz (30 metre), 18MHz (17 metre) and 24MHz (12 metre)

manufacturer's leaflets and knows where to find magazine test reports.

It's worthwhile mentioning here that I initially wanted an FT-690 Mk1, to match my other FT-x90 transceivers. However, I bought the Mk2 version after friends advised that it was a better radio. So...I strongly recommend that when you go out to buy second-hand, take a knowledgeable friend!

Older Equipment Information

Now it's time to enter what could be considered a problem area. I suggest this because you may be thinking "How else can I find information on older equipment, especially if no-one has any old leaflets or test reports?"

Fortunately, in answering your cry for help...several books of test reviews have been published. So let's have a brief

look at them.

Firstly, America's national Amateur Radio Society, the **American Radio Relay League** (ARRL) published the *Radio Buyers Sourcebook* in 1991) and the *Radio Buyers Sourcebook Vol 2* in 1993. Both books are compilations of the ARRL's *QST* magazine test reports.

Test reports re-published in the books cover h.f. and v.h.f./u.h.f. transceivers, linears, and all sorts of accessories. The accessories include equipment such as TNCs, RTTY terminals, power meters and s.w.r. bridges and rotators.

The books also include comparison tables for the radios and indices of *QST* reviews and articles about the equipment. Incidentally, these books are available from the PW Publishing Stand at rallies and make for very enjoyable (and nostalgic) reading even if you're not looking to buy anything.

However, if you're planning a trip to the famous Dayton HamVention in, Ohio, USA - the ARRL's book would be very helpful. From what I've heard...the PW reader on the Dayton holiday trip often filled their homeward bound Boeing 747 with their bargain buys!

From this side of the Atlantic, the **Radio Society of Great Britain** (RSGB) *Rig Guide* (2003) is an A4 format book providing summaries of lots of equipment together with a useful price guide and a selection of equipment reviews. You may also find an earlier book entitled *The RSGB Rig Guide* which was published in 1996 and is A5 format. Personally, I have a copy of each of these books and both provide for fascinating browsing.

Although it's not a book (instead it's a floppy disk for use in a computer) there's a floppy reference source. This is the *Twrog Rig Review* (£7 from Twrog Press, Penybont, Gellilydan, Blaenau Ffestiniog, Gwynedd, LL41 4EP).

All you have to do is to pop the disk in your PC's floppy drive and select the application (.EXE) file. You then get a neat screen of some 40 different radio manufacturers.

Next, select a manufacturer and you'll get a list of their radios. I noticed a few typing errors...but you can edit your

own notes into the file which makes it extremely useful. Incidentally, I've used the disk successfully in both Windows 95 and DOS 6 systems.

Finally, you may be able to get hold of a copy of the RSGB's *Buyers Guide To Amateur Radio*. This was published during 1986.

At over 400 pages long the *Buyers Guide* has a review list that covers the majority of equipment you'll find in the second-hand market. I think this is arguably the best of all the books I've mentioned. Sadly, it's now out of print (and, yes...I did buy my copy second-hand).

Best Time To Buy?

I can almost hear you asking the next question..."When is the best time to buy?" And in offering advice it's worth mentioning I've found that Dealers' open days can be useful.

For example, I bought an FT-790Mk1 second-hand at a dealer's open day and received an immediate 10% discount. There's no reason why you couldn't do better...especially if a new model or variant is expected and dealers want to clear their stocks of the existing model or variants.

At rallies, buying towards the end of the day can also result in bargains. This is more than a possibility when the seller is unlikely to get any other offers...and wants to take home as little unsold equipment as possible.

Best Time To Sell?

When it comes to judging the best time to sell at a rally, is that get your sale items onto the B&B or dealers' shelves as quickly as possible. It will then have the maximum exposure to the would-be buyers.

If you choose to sell via a classified advert then aim to sell when your would-be buyer is likely to have money to spare. Selling in the post-Christmas period may not be a good idea.



● If you're not interested in the Kenwood TM-241E you could invest in an Austin Seven 1938 Ruby saloon. And remember...hang on to those old light bulbs in future and don't throw them away. In 50 or 60 years time they could be worth something!

Perhaps selling just at the run-up to the holiday season is a good idea, if what you are selling might make a good radio for someone to take on holiday. So, be aware of the plans your friends have for their station. You might have the very bargain they do not yet know they want and as this is a two-way game which your friends can play too...they might have something to sell to you to raise money towards their holiday!

Prices Steady

In rounding off this article, I think it's worth a mention that in my opinion unlike old camera equipment, there seems to be little sign of collectors pushing up the prices of second-hand Amateur Radio equipment. There are still great bargains to be had in the second-hand market!

Despite their apparent lack of memories, a.a.t.u.s, extra v.f.o.s and other features, older transceivers may not sound much different from their modern counterparts when they're on the air. They can also still provide extremely effective communications and pleasure to their owners.

Finally, just to show that I do like second-hand equipment, here's a summary of my own station's history. My first transceiver was an FT-101B which was sold at short notice to one of my regular, friendly dealers when unexpected bills

came in. My FT-221 went the same way as did my Microwave Modules 432/144 transverter.

My current station covers h.f., 50, 144 and 430MHz and I can operate phone, c.w. or datacoms. The equipment consists of an FT-757 GXMkI - bought as an end-of-line bundle from my favourite dealer. There's also an FC-757AT (matching a.a.t.u. for the FT-757GXMkI) - which was bought second-hand from a dealer, an FT-690MkII - bought second-hand from my other favourite dealer. It was on offer with a linear but the dealer was happy to separate the two and sell me just the transceiver. I also have a FT-290 - bought from a friend who used to run a superb Aladdin's cave of radio and electronic items. My FT-790 - was bought second-hand on a dealer's open day with 10% discount. On the diatoms side I have a KAM TNC - bought second-hand from a friend who had bought it from a classified advert in a commercial magazine and didn't know exactly what he had bought!

On the computer side I've got a Commodore 64 - bought as surplus stock from dealer at a rally. The disk drive and printer were both bought second-hand from friends.

There's also a vacuum cleaner (yes, there really is one in my shack) it's second-hand and was given to me by a friend. That's how I got my reputation for 'Hoovering up' the bargains!

PW

Antenna Workshop

UP THE LADDER on a campsite!

Hi! It's good to be back again writing for *Practical Wireless* - and although I'm not a Radio Ham myself, a job I've recently completed may give some of you some ideas for future holidays. But to start the story I must go back to the early spring when I was contacted by a farmer who lives in the new Forest in Hampshire.

The farmer had a TV problem - and so did anyone staying on his 20-pitch camping and caravan site. The problem was due to the surrounding screen of beautiful trees. Idyllic to look at - but in full leaf (and particularly when they're wet) they're virtually 'radio opaque' at the u.h.f. frequencies used for Band V and IV television broadcasting. There's also a large metal hay storage barn which partially screens the incoming u.h.f. signals.

The diagrams, **Fig. 1**, and **Fig. 2**, provide a good illustration of the problem caused by the dense foliage of the trees, and my eventual solution for the problem. Actually, I'm grateful to the *PW* technical draughtsman, **Tex Swann** for his help in preparing these illustrations. If you saw my original 'artwork' you'd realise my skills don't extend to any form of art!

There are very many large campsites in the New Forest, but the one in question is a smaller

**Professional TV & Radio
Antenna Engineer Alan
Wightman** has been busy on a campsite! And from what he has to say, the TV distribution system described could benefit all users of the site in question, including Radio Amateurs.

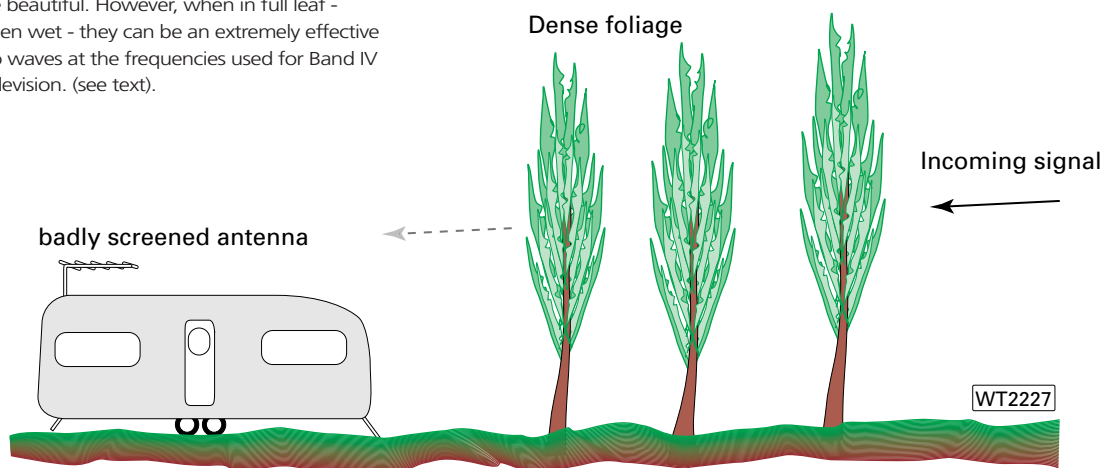
site operated by a farmer rather than the Forestry Commission. The site only holds a maximum of 20 or so pitches and the farmer had an unusual problem...because his site attracts customers who have over the years become friends. In other words they return year after year and their requirements are changing.

Holiday TV

In the past when people went on holiday they often wanted to leave the trappings of modern life behind them...including TV. That's changed now and although lightweight campers still arrive by pedal power and sleep in tents...quite a few arrive in large - almost coach sized - motorhomes. All these luxury vehicles come with television fitted, some have satellite TV and there are even those fitted with roof-top mounted air-conditioning!

In recent years campers and caravanners have changed their expectations regarding TV when they're on holiday. Once upon a time if they even bothered to take TV...they only took a small monochrome receiver and trusted to luck where or not they got a watchable picture on the set-top antenna or the occasional wide band (but not correctly polarised) antenna. Nowadays though it's more likely to be a larger colour set...often

● Fig 1: Trees are beautiful. However, when in full leaf - particularly when wet - they can be an extremely effective barrier to radio waves at the frequencies used for Band IV and V u.h.f. television. (see text).



operating from the mains supply provided by the campsite.

As a professional TV and radio installation engineer I have often wondered about those weirdly shaped v.h.f./u.h.f. antennas fitted on caravans, which seem to have much 'character' about them...but with very little aperture. In other words...they just don't have enough real antenna metalwork exposed to the incoming wavefronts to intercept those all-important wavefronts.

And it was because of the problems with poor reception that I had my very first call to a campsite where the forward thinking farmer had decided "enough was enough"...the poor reception had to be overcome.

Several Hams had enjoyed staying on the site...but had limited their on-air activities because of the poor TV reception. So, indirectly, my visit to the beautiful New Forest could also end up helping one or two of the visiting Radio Hams!

Tree Trouble

Anyone who has visited the New Forest – which is basically speaking mainly between Southampton and Bournemouth - will know it's not all thick forest. In fact, much of it is open heath land, with occasional very heavily forested sections. It's in one of the latter areas between Beaulieu and Lymington where my customer's campsite is located.

As the diagram shows (Fig. 2), the site is just off a (minor) road and is surrounded by thick forest. The trees are a mixture of native oak, beech and elm interspersed with conifers.

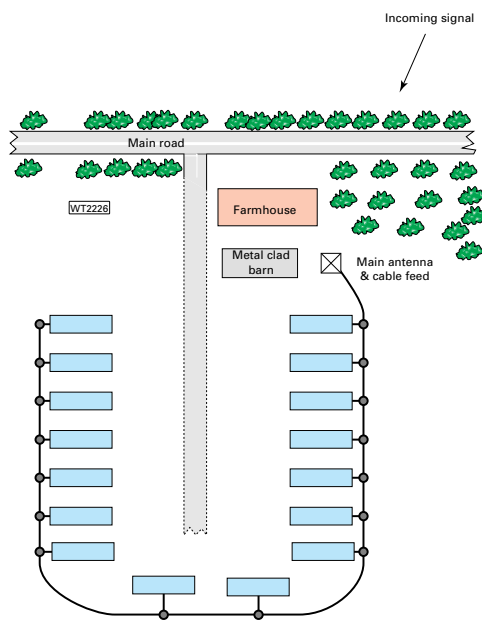
The trees provide truly beautiful surroundings and in my opinion 'make' this campsite. Even on my first visit in April I could see why visitors wanted to return...it was delightful.

Unfortunately even the farmer had problems with getting a good TV signal for his own home. However, that was overcome when with the help of his son and some keen climbers a 4m high pole was mounted on top of the farmhouse chimney to help the antenna clear the trees.

Because of the height of the trees the farmhouse masthead antenna still didn't get a 'line of sight' view to **Rowridge (Station 108, National Grid Reference SZ 447865)** on the nearby Isle of Wight. Despite this it was still able to provide an excellent signal. They'd solved their problem and had unwittingly prepared the ground for my work!

Survey Time Saved

Realising that a cable-fed master antenna system would be a good idea the farmer called me in to do a survey. On arriving it was obvious to me from my measurements



● Fig. 2: A plan view of the campsite with a simplified (see text) illustration of the cable fed system installed by Alan Wightman. The system feeds groups of distribution amplifiers and uses mains derived 12V power, from a protected supply at each caravan/tent plot (see text).

that a full u.h.f. survey (Band II v.h.f. services at the site were excellent) wouldn't be necessary. All I had to do was to make the existing antenna the 'master' or locate it nearby, depending on the field strength meter results from the antenna on my van mounted 10 metre high pneumatic mast.

In the end it was decided to re-locate the antenna, because I found that all channels provided slightly better terminated signals levels a little way from the house. Another reason was that by having the master antenna located away from his home, the farmer could then offset the cost of installation within the campsite's accounts.

Incidentally, I understand that in some parts of the UK (particularly Scotland and Wales) grants are possible to help camping site owners improve facilities for their customers. So, if you use such a site yourself...and want to enjoy your Ham Radio hobby without the dreaded EMC problems caused by poor TV signal levels...make sure the campsite operators check on the possibilities.

The System

There were several ways of feeding the TV signals around the site and the farmer opted to for a simple system, which with the minimum outlay he could also maintain himself. The diagram in Fig. 2, is somewhat simplified so I'll describe in detail.

Although not shown, the farmhouse has the original antenna, thus making it totally separate. Two reasons for this –one was to save unnecessary cabling and the other was for campsite tax purposes!

To reduce expenditure on a really 'heavy duty' distribution system the farmer had opted to use 6-way amplifier units which are easily obtainable from d.i.y. stores. These are very reliable and I chose a type, which avoided using the 50MHz to 1GHz wide band approach. The selected amplifiers were 'banded' - in other words they covered Band II v.h.f. for radio and Bands IV and V for television. In this way 'out of band' interference is less likely to occur.

Each caravan/tent plot is provided with a 13A metered supply and a 12V battery charger (an excellent idea I think). Don't forget, some of those big tents are like portable houses nowadays with refrigerators and lighting!

The first plot receives the incoming signal from the master antenna. This goes into the 6-way distribution amplifier. Five plots are fed from one amplifier, with the sixth feed running on to the next amplifier. In total four amplifier units were used, providing 3dB gain from the antenna feed input to each output.

As already mentioned, the diagram in Fig. 2 is simplified. In fact, to provide campers as much 'breathing space' as possible the plots are actually grouped back-to-back around the similarly grouped power points...which certainly helped with the cabling! Power for each amplifier was from the supplies available in waterproofed lockable-doored boxes (complete with an appropriate earth leakage protection system).

However, although the system works very well indeed (I was quite satisfied with the P5 quality picture viewable throughout the system) there are potential problems feeding a system in 'cascade' in this fashion. This is because at the farther end of the cable line the plots could have a very high level of signal...including amplifier noise, intermodulation products and other unwanted rubbish which we all know come from TV receivers!

The problem occurs because each amplifier will be receiving r.f. products from previous receivers and the set it's feeding...and of course as it's also in-band it will be increased in level by each amplifier in the 'chain'.

If the number of plots is increased (unlikely) I've advised the farmer of various alternatives. One would be to run another antenna input for other groups of amplifier to feed the other plots.

Personally speaking I wish more campsite owners would adopt this approach as everyone would benefit. His customers would be pleased to come again and they'll all be happier when it rains. And those that are also Radio Hams can relax knowing that they're unlikely to cause interference to TV receivers struggling with inadequate incoming signal levels.

Cheerio for now.

pw

Value & Vintage

Charles Miller continues the story of his life and adventures with wireless. And once you've read this selection of mishaps... you'll know where the inspiration for the Laurel & Hardy film scripts came from!

Hello again! Welcome back...and I take pleasure in continuing the *Miller Memoirs* onwards from the accident described in the July issue of *PW*:

Following my colleague's misfortunes...it was my turn to do the tripping on another service call. This time it was to a TV set whose owner complained of a weak picture.

It was a filthy night with rain sheeting down and since the front of the house was in total darkness I sent Alf to knock the door. This was to check that someone was in before I ventured out into the monsoon myself!

I saw Alf perform with the door-knocker and then give me the thumbs up to signify that someone was coming to open up. At this I sprang from the van and charged across the street at high speed.

Unfortunately I tripped heavily on the kerb, completely lost my balance and took Alf right in the pit of his stomach with my head. At this he let out a powerful roar of pain, straight down the left ear of the man who had simultaneously opened the door.

Fortunately, the somewhat unconventional mode of address did not, oddly enough, appear to cause the man any great surprise. Maybe he thought that all television engineers introduced themselves in this way?

The householder beckoned us to come to an unlighted front room and through this to a sitting room at the back of the house. On route he was wittering away about how he thought it must be the picture valve that had gone in his set.

Alf and I made no reply at all to his remarks, because in truth, we were bursting with silent mirth and incapable of uttering a single word. To make matters worse, only one glance was needed at the TV set for us to see that the cathode ray tube (c.r.t.) was on its last legs.

New Tube Sir?

In the days before c.r.t. filament booster transformers had appeared, only the tube's replacement could bring that set back to useful life. This was a very serious matter in those days, because a 12-inch type cost all of £16, equivalent to about £600 today.

So, it was therefore usual to give the bad news to the customer in a suitably hushed and reverent manner. Instead of which all I could manage was "I'm afraid - tee hee - that your tube has - hee hee - gone and you'll have to have - hee hee - a new one". The effort of making this statement proved too much for my self-control and I

erupted into helpless laughter, followed immediately by Alf.

"I'll let you know if I want the job done"...muttered the customer as we staggered to the door. And I for one wouldn't have blamed him for ever calling us in again!

More Memory Lane

For sheer bravura the two trips I've just described were far out-classed by two that took place a year or two later. By the mid 1950s my trade had grown to such an extent that I had to take on two full-time workers - **Dennis** and **Big Ken** - and still needed several part-timers.

One evening Dennis and I set out to return to the customer a 12-inch Ekco table TV set...and yes...it was to the same housing estate as figured in the Pye and Bakelite radio episodes. Conditions, though, were vastly different, it being summer time and the street was flooded with sunlight, with excellent visibility.

The good weather did not, however, prevent Dennis from omitting to notice a small but important feature of the topography. I opened the back doors of the van, he picked up the set and started off with it in his arms whilst I remained where I was to close the doors.

Having closed the doors, I stepped onto the pavement in time to witness a somewhat puzzling event. Still holding the set in front of him, Dennis was sprinting down the concrete garden path at high speed. I leaned on the fence and pondered why he should want to perform this athletic feat and just how he intended to bring himself safely to a halt before he reached the closed side door of the house?

The short answer is that he didn't stop. He took it at full tilt with his head, and although, as I learned later, the door had been bolted on the inside against intruders, he burst through it and disappeared from my view in a crescendo of shattering milk bottles.

Paralysed Laughing

I continued to lean on the fence for a little while, paralysed by laughter. This continued until I was sobered by the thought that somehow I was going to have to explain this curious behaviour to the customer.

I feared that even my fertile imagination might not prove equal to the task. Also, there was the possibility that Dennis might not have survived his stint as a human battering-ram; what should I tell his family?

No man can burst open a bolted door and destroy a dozen milk bottles on a quiet summer evening in suburbia and expect not to draw attention to himself. This fact was borne to me when I walked along the path to find the entire household gathered around Dennis' inert figure.

It so happened that the pater familias was an osteopath, and it was he who helped Dennis to his feet and after appraising him with a professional eye declared him to be sound in limb...if somewhat dazed. It seemed to me to be a miraculous survival, transcended only by the fact that the TV set also had escaped damage and was still in working order.

Dennis told me what had happened after a suitable period of recovery. Right at the start of the concrete

path, beneath the gate, was an inch-high lip which had been sufficient to trip him, and his high-speed dash had been a frantic attempt to regain his balance.

I now know just how it feels to the subject of a 'Dennis Trip' because years later I did the same sort of thing myself whilst attempting to carry a large box of electrical accessories into a farmhouse. You really don't have time to think about the possible consequences of the mad dash...instead you're intent only on recovering

four lengths of timber to its legs to raise it even higher off the floor.

We had no intention of trying to tackle the monster in situ and told the owner that we would have to take in to the workshop. He was agreeable, so Ken and I prepared to carry the radiogram out to the van. We stooped to pick it up and following my usual practice, I manoeuvred Ken into being the one who would have to walk backwards.



● "I stepped onto the pavement in time to witness a somewhat puzzling event. Still holding the set in front of him, Dennis was sprinting down the concrete garden path at high speed. I leaned on the fence and pondered why he should want to perform this athletic feat.....".

equilibrium at all costs!

In my case I impinged upon a large wooden-cased water pump in the farm yard with a noise like a thunderclap, yet escaped completely unharmed except for ribs made sore from immoderate laughter. It seems to me that there must be a special department in Heaven to look after incautious service engineers.

Guardian Angel

The services of the Engineer's Guardian Angel were certainly needed one evening when I went out with Big Ken on a service call to a block of flats near the town centre. This three-storey building had in fact at one time been a private school run by two maiden ladies, and which I had attended in extreme youth.

Some time after I left, the school must have closed down and been converted to its present function. As we entered the front door, in my case for the first time in many years, we perceived in front of us a short flight of stairs, possibly with about five or six treads. And it was a pity really that we hadn't been a little more careful about counting them, as things turned out.

On the right-hand wall as we looked at it, about four feet up from the half-way mark on the stairs, was a large wooden switch-block fully occupied by at least a dozen Bakelite surface type switches. Beyond the top of the stairs was a shadowy corridor illuminated by one low-power lamp, and again on the right was the door to the flat we had come to visit.

We were admitted by an elderly gentleman who showed us into an inner room where stood an immense EMI radiogram of c1935 vintage. As if this set weren't vast enough already, someone had bolted two four-by-

Using the four-by-fours as handles, Ken and I negotiated the front door of the flat safely and set off down the corridor. So far all was well!

The disaster occurred when we reached the short flight of stairs, which I remembered as having six treads and Ken recalled as having five. He thus went down that number, then stepped back confidently believing himself to be on the lower floor.

In the event, my estimate had been correct and Ken fell something approaching 18 inches before hitting the ground. This caused him to jerk the radiogram forward and sideways, nearly out of my grasp and in the process sweeping that large switch block completely off the wall.

Unfortunately, as all the cables running to it came adrift and intermingled there was a blinding flash and every fuse in the building must have blown as the whole place was plunged into stygian darkness.

Simultaneously Ken and I burst into hastily smothered laughter which threatened to cripple us and how we managed to continue carrying the set out of the building and into the van I'll never know.

Once we had put the set down all we could do for the next five minutes was to sit in the back of the van crying with laughter. Eventually we recovered ourselves sufficiently to drive away and to make some more service calls, after the last of which we deliberately drove back past the flats to find that every other building was showing lights save that one.

We never did discover the ending to the story regarding the switch block. The radiogram was never repaired and its owner never enquired about it. I can almost imagine him sitting in that flat to this day, knee-deep in candle ends and empty matchboxes and wondering if he'll ever see his set again?

PW

Trader's Table

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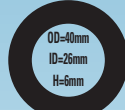
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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

This summer's Sporadic-E season will probably be recorded as one of the best that has occurred for many years. Although slow to start, it really kicked into gear during June with 50MHz openings reported every single day throughout the month from somewhere in the United Kingdom.

The June highlights included 15 multi-hop transatlantic Sp-E openings on the 50MHz band to North and South America and ten openings that reached the 144MHz band with contacts being made throughout Europe and into Africa and Asia. And so into July and what a month it was! Sp-E activity was again very intense with 50MHz openings recorded on all but three days during the month.

Multi-reflection openings were noted on many days throughout the period with many contacts being made into Asia, Africa, Europe, North America and South America. DX activity was at an all time high with c.w. and s.s.b. contacts being made on the 50, 70 and 144MHz bands.

The highlights of the month include the **15** multi-hop transatlantic Sp-E openings on the 50MHz band to North America, South America and the Caribbean Islands and **eight** openings that reached as high as the 144MHz band. During one of these openings, s.s.b. contacts were being made deep into Russia at distances in excess of 3000km. But it got better than this!

Right at the end of July the prevailing weather patterns in the lower atmosphere caused a terrific tropo opening to Spain, Portugal and the Canary Islands. These islands lie some 3000km from the UK and stations located in southern and central England and Wales managed to make s.s.b. contacts with EA8-stations on the 144MHz band.

One *PW* reader, **Reg Woolley G8VHI** even managed to make an s.s.b. contact with EB8AYA on the 430MHz band smashing the existing IARU Region 1 DX record in the process. He also made a QSO with that station on the 144MHz band and a few days earlier had contacted RB6BN via 144MHz Sp-E at 3032km. That's three contacts over 3000km on the 144 and 430MHz bands. Well done Reg. Absolutely brilliant!

THE 144MHZ BAND

With daily Sp-E openings on the 50MHz band including the 15 days of multi-hop transatlantic propagation it was not surprising that some of the ionospheric E-layer events enabled contacts to be made on the 144MHz band. A total of eight such openings were

reported on July 2, 5, 6, 8, 9, 19, 21 and 22.

With two exceptions, all openings occurred between 1600-1900UTC (the others were around 1200UTC and between 1400-1700UTC) and restricted to countries lying between the east and south of the UK.

The first 144MHz Sp-E opening of the month occurred around 1800UTC on July 2. Uncharacteristically, this was the first time since the beginning of May that even the 50MHz band had been dead for much of the day. This was to catch operators out as many

and s.s.b. working huge numbers of German (DL) stations.

The station of EK6DZ/P (Armenia LN10) reports making contacts into Czech Republic, Germany, Hungary (HA), Poland and Lithuania (LY) and LZ3NY found 7X0AD (Algeria) and heard the station of CT3AN at an amazing 3652km!

Propagation was kinder to UK contesters on July 6 with a lengthy but 'spotty' opening to Romania (YO) between 0830-1100UTC. The station of **G8IZY** (IO91) reports that despite a

THIS MONTH DAVID G4ASR HAS REPORTS OF SOME AMAZING CONTACTS BEING MADE ON THE 144 AND 430MHZ BANDS!

had formed the opinion that nothing would happen during the evening.

Late in the afternoon though a huge Sp-E cloud formed over northern Spain that allowed a few stations in southern England to make s.s.b. contacts into Morocco, North Africa.

Dave Edwards G7RAU (Isle of Wight IO90) thinks that only himself and the station of G4RRA were in on this opening.

At the beginning of the event, Dave heard EA8TO (IL18) over a 2800km path, but signals were very weak. Local lightening static was peaking to S9 and no contact was made. At 1832UTC he managed to contact the station of CN8KD (IM63) at 1917km.

Two minutes later a lightning strike hit nearby and he lost all his mains power! **Paul G4RRA** (Devon IO80) reckons he was right on the edge of the opening. Running an Icom IC-275H transceiver and amplifier into a pair of 10-element Yagis he also worked the station of CN8KD and heard CN8LI before propagation disappeared.

The weekend of July 5-6 saw many high-power 144MHz stations active throughout Europe for the v.h.f. field day contest. On July 5 between 0645-0900UTC and later between 1400-1900UTC there was excellent Sp-E propagation in central Europe. Unfortunately, these events didn't quite make it into the UK, although one or two contacts were made by stations in East Anglia (JO02).

The afternoon opening lasted for five hours and found Czech (OK) and Polish (SP) stations busy for hours working deep into Russia (UA6) and Ukraine (UT5). Several Turkish (TA) stations were also active on f.m.

major contest there was much less QRM than usual with most contesters operating well away from 144.300MHz. Between 0854-0856UTC he worked YO4FRJ/P (KN34), YO4RFV/P (KN35) and YO4RXX/P (KN35).

According to **G8HGN** (JO01) many contest stations seemed unaware of the Sp-E opening due to 'contest-mode' operating. They were more intent in calling CQ rather than tuning the band to see what was going on.

At 0844UTC G8HGN heard YO3FFF/P (KN24) and then went on to work YO2KKB/P (KN06). The station of YO4FRJ/P was heard briefly at 0852UTC before the event faded out at his QTH.

The contest station **G3CKR/P** (IO93) running 20W to a 17-element Yagi worked the stations of YO2KQD/P, YO4RFW/P, YO4RXX/P and heard UX0FF (KN45) at 2380km. Dave G7RAU mentions that the opening was very patchy at his location. Between 0848-1040UTC he made s.s.b. contacts with the stations of ER5AA (Moldova KN45) at 2229km, YO3DMU (KN34) at 2160km, YO4FRJ/P at 2126km, UR7C (Ukraine KN18) at 1745km and UR7D (KN19) at 1751km.

The station of **GW8ASA** (IO81) was unable to hear any of the DX being worked by others, but at 1040UTC up popped the station of UR7D who was promptly worked before QSB set in. This situation often happens during a Sp-E opening as the propagation can be extremely selective. One station may be making dozens of DX contacts whilst another only a few kilometres away may hear absolutely nothing.

Sporadic-E conditions on July 8 was very

similar to that already experienced in previous weeks. In the morning and early afternoon the maximum usable frequency (m.u.f.) was not very high. By late afternoon Spanish f.m. broadcast stations were being heard in Germany and Netherlands and the m.u.f. was rising very quickly.

At 1524UTC the 144MHz band opened between southern Spain and Germany and by 1545UTC the band was in good shape for a nice Sp-E opening. Stations in Spain (EA7), Balearic Islands (EA6) and Portugal (CT) had an opening into DL, OK, PA and SP and UK stations made it into EA6, France (F) and Italy (I).

The opening lasted for one hour fading out around 1645UTC. The station of G4HGI (IO83) made two contacts, F1FIH and F5SDD (JN23), both located on the Mediterranean coast. The station of G7RAU calculated that the m.u.f. was greater than 200MHz when he contacted F5IVP (JN23) over a path of only 950km.

Only the station of EA6/DF9UX (Balearic Islands JM09) was heard at the QTH of G8HGN and it was similar at GW3LEW (IO71) who could only find IC8CQF (Capri JN70). At G4RRA contacts were made with IC8CQF, IZ5EME (JN52) and IW0WGF (JN52).

Propagation on July 9 followed the pattern exhibited on the previous day with the Sp-E cloud almost in the same location. At 1515UTC the 144MHz band opened up from Spain (EA7) to Germany and from EA1 to Croatia (9A) and Slovenia (S5). A few minutes later a big opening started from south-west to north-east and from north-west to south-east as shown in Fig. 1.

The opening at 144MHz faded out at 1725UTC, but continued late in the evening at 100MHz with strong Spanish f.m. broadcast stations being received throughout the UK. Paul G4RRA reckons that his locator square was good for Sardinia (IS0) but nothing else.

Between 1540-1652UTC he contacted the s.s.b. stations of IS0GF, IS0GQX, IS0/IW2MXY and IS0/IK6DZH. Welsh stations also found a path to Sardinia with GW3LEW (IO71), GW4DGU (IO71) and GW7SMV (IO81) all making a solitary contact with the station of IS0GQX (JM49).

Stations located in south-east England couldn't work into Sardinia, but had a path to the Balearic Islands (EA6) instead. Between 1615-1627UTC the station of EA6SA (JM19) contacted G1HWY (IO90), G3KEQ (JO01), G3YDY (JO01), G4AJC (IO91), G4DEZ (JO03), G4FUF (JO01), G4KIY (IO92), G4ZFJ (JO01), G8IZY (IO91) and G8WXU (JO01).

John Regnault G4SWX (Suffolk JO02) contacted EB6ADS (JM29) and EB6AOS (JM19) and G7RAU on the Isle of Wight also worked EB6ADS for a short-haul contact at 1280km.

For the next ten days there wasn't a glimmer of Sp-E propagation on the 144MHz band, although of course it was a daily occurrence lower down at 50MHz. Propagation on July 19 looked promising with a very high m.u.f. early in the morning with many eastern European f.m. broadcast stations being heard.

Conditions on the 50MHz band was excellent with stations such as A61AH (United Arab Emirates), A71EM (Qatar), HZ1MD (Saudi Arabia), JY9NX (Jordan), SU1SK (Egypt), TA2RC/P (Turkey), 4X4IX (Israel) and 5B4AGC (Cyprus) being worked between 0800-1800UTC.

Between 1145-1205UTC the m.u.f. reached the 144MHz band with stations in south-east England making contacts into Italy (JN62).

Two days later on July 21 another intense

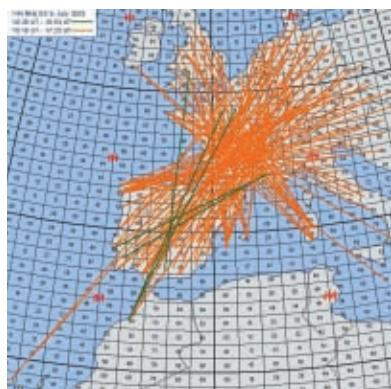


Fig. 1: Propagation on July 9 followed the pattern exhibited on the previous day with the Sp-E cloud almost in the same location. Just after 1515UTC a big opening started from south-west to north-east and from north-west to south-east.

Sp-E cloud formed enabling contacts to be made on the 144MHz band. At 1500UTC the large area of ionisation was located over eastern Europe and stations in Finland (OH) were working into Bulgaria (LZ) and Macedonia (Z3).

Two hours later the ionisation moved westwards allowing stations in eastern England to make contacts in Belarus, Russia and Ukraine. John G4SWX located near the coast of Suffolk (JO02) was in an ideal location to work a handful of Russian stations. His s.s.b. contacts made between 1718-1747UTC included EW6GB (Belarus KO45) at 1850km, RA3APQ at 2390km, RA3AQ at 2391km, RK3AF at 2379km and UA3ARC at 2390km, all being situated in KO85 locator square.

Best DX of the event was UA3DHC (KO96) at 2427km. Tim G4LOH (IO94) spent a frustrating two hours listening to Dutch and German stations working all the fantastic DX. At 1720UTC he did however work UT8AL (Ukraine KO61) at 2360km.

Probably one of most intense openings during this year's Sp-E season occurred on July 22. At 1347UTC the 144MHz band was open from Germany to Romania and a little later from Denmark to Bulgaria, Romania and Turkey. From 1420UTC stations in England had an excellent opening to Hungary, Moldova,

Poland, Romania, Russia and Ukraine. This phase lasted for an hour to be followed by another event between 1630-1700UTC also to Russia and Ukraine.

Take a look at Fig. 2 which shows all the paths being worked during the opening. Between 1441-1451UTC the station of M1MGD (IO91) worked ER5AA (Moldova KN45), YO5BWD (KN27) and US5WU (KO20), all signals 59 bothways. At G4SWX s.s.b. contacts were made between 1631-1701UTC with UA3WM (2309km), UR5LX (2398km), UT2AM (2315km), UT5ER (2360km), UX5UL (2029km) and UY5UG (2033km).

First prize though went to Reg G8VHI (Warwickshire IO92) who completed an amazing 3032km contact with the station of RB6BN (KN95). The Russian station was using his e.m.e. system consisting of sixteen 16-element Yagis and a GS35B amplifier running 1kW output. He also worked the stations of G3LTF (IO92) at 3032km, G4FUF (JO01) at 2892km and twelve other Europeans stations over 2500km away.

The station at G8VHI consisted of a TS-

2000 transceiver, 220W amplifier and a pair of 14-element Yagis. Reg mentions that the station of RB6BN was only audible at his QTH for less than one minute! His other s.s.b. contacts made between 1430-1507UTC included HA6VV (Hungary), SQ8CMA (Poland) and seven YO stations.

As if that wasn't enough DX for one month, Reg also broke the IARU Region 1 430MHz DX record

when he contacted the station of EB8AYA (Canary Islands) at 1148UTC on July 31. He used a TS-2000 transceiver with an MGF1302 low-noise amplifier (in the shack) and a 100W amplifier feeding a pair of 23-element CueDee Yagis.

Signals on s.s.b. were 52 bothways via a tropo duct that had formed to the south-west of the UK. Interestingly the previous 430MHz record holder was none other than GW8VHI when Reg used to live in South Wales! He reports also contacting EB8AYA on the 144MHz band earlier in the morning and just before being worked on the 430MHz band the station of EB8AYA was peaking 58 on 144MHz.

DEADLINES

Yet another terrific month with many long-distance v.h.f. DX contacts being made. Thank you for your reports. Please keep sending them in to the address and by the date given at the top of the column. Good luck with the DX and see you again next month.

73 David G4ASR

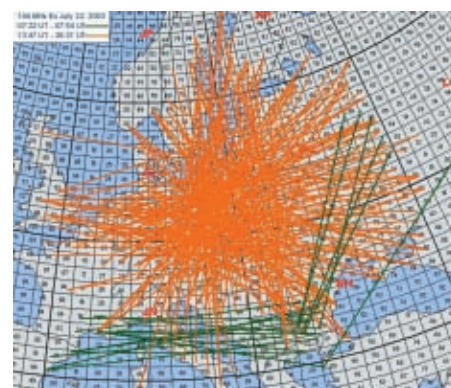


Fig. 2: Probably one of most intense openings during this year's Sp-E season occurred on July 22. This chart shows all the paths being worked during the opening.

HF HIGHLIGHTS

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

Monk Apollo on Mount Athos, situated in the eastern peninsula of Halkidiki, has been silent for a couple of months now after having trouble with his old Icom transceiver. This broke down a few months ago and unfortunately repairs have not been possible.



● Martyn Medcalf M3VAM working h.f. from home with his new PBX-100 vertical antenna.

Without a radio it looks like Monk SV/A will not be heard until a replacement can be found. However, help may be on the way as members of the **Northern Ohio DX Association** have decided to see if they can get him back on the air.

Since NODXA has not heard of any other organisation stepping forward to help, they have decided to try to collect funds and purchase another transceiver. Currently, they are looking for 'Pledges Only', so they can gauge if there is enough interest to fund this radio.

Once NODXA is sure that there will be enough money, an address will be announced where these donations can be sent. If you are interested in helping out, please contact **Tedd Mirgliotta KB8NW** at 16806 W 130th Street, Strongsville, OH 44136, USA or send an E-mail to kb8nw@arrl.net

7MHz BAND CHANGE

As I'm putting the column together there has been some good news from the World Radiocommunication Conference 2003 for 7MHz enthusiasts. In an 11th-hour compromise, delegates to WRC-03, which officially ended on the 4th July, agreed to move broadcast stations out of the 7.1 to 7.2MHz portion of the band in Regions 1 and 3 to make more room for the Amateur Service.

The agreement will eventually mean a 200kHz world-wide allocation at 7MHz although the change doesn't go into effect until the 29 March 2009. This is considered fast in International Telecommunication Union (ITU) terms and some of the timescales proposed

in English at

www3.ocn.ne.jp/~iota/newpage61.htm

DX NEWS

DX news now and **Franz DJ9ZB** (3C0F), **Elmo EA5BYP** (3C0A), **Victor EA5FO** (3C0R) and **Vicente EA5YN** (3C0V) will be active from Equatorial Guinea which is about 124 miles (200km) North of the Equator on the hot humid coast of West Africa.

They will operate on Annobon Island (AF-039) between 27 September and 10 October on all bands using c.w., s.s.b., RTTY and p.s.k. with possibly some SSTV as well. Hopefully they will have at least two stations on the air 24 hours a day and if you work them, QSLs

ALONG WITH YOUR HF REPORTS THIS MONTH, CARL GW0VSW HAS NEWS OF A 7MHz BAND CHANGE...

during the discussions on the 7MHz agenda would have held off the changes until 2033!

The year 2009 was chosen to allow broadcasters time to change their schedules and complete any engineering work that might be necessary. It's thought that early access to the expanded band here in the UK may be possible by January 2005, but this will have to be negotiated by the RSGB with the Radiocommunications Agency (Defcom). There's no change in the exclusive US 7MHz allocation where amateurs will still be able to enjoy the full 7000 to 7300kHz band they now have.

NEW AWARD AVAILABLE

The **Japanese IOTA Islands Award** (JIIA) is given for working islands in Japan and initially you have to make contact with 10 islands that have JIIA numbers. Stickers are then given for 25, 50 and 75 contacts, which can then be added to the award. No QSL cards are required and you only have to submit a log extract giving the date, time, band, mode and callsign worked, signed by two other Amateurs.

Endorsements are available for both band and mode and applications should go to the award manager **Yukihiro Deguchi IOTA-JA, 4796 Takashima-cho, Yatsushiro City, Kumamoto 866-0014 Japan**. The rules and application form for this award can be found

should go to DJ9ZB.

The Austral Islands are located south of Tahiti and spread across 1,280km of the South Pacific and straddle the Tropic of Capricorn. Tubuai (OC-152) is the largest island at just 17 square miles (44 sq km) was visited by Captain James Cook in 1777. It is here that **Richard DJ4OI**, **Andy DL3GA**, **Markus DL1IAN** and **Joachim DF6IC** plan to operate as FO/homecall/A from 18 September to 3 October. Two stations with beams and linear amplifiers will operate on 3.5-28MHz c.w., s.s.b., RTTY and probably other digital modes as well. All QSLs via the operators home call direct or via the bureau.

Onto the Turks and Caicos Islands now where **Dave AH6HY** will be active as VP5/AH6HY from Grand Turk Island (NA-003) from 26 September through to the 4 October. Expected activity will be on all bands 7-28MHz, but s.s.b. only. Take a look at Dave's website at <http://www.qsl.net/ah6hy/> for further details. All QSLs via AH6HY.

The Seychelles is a group of volcanic and coral islands that lie in the western Indian Ocean about 726 miles (1200km) from the coast of East Africa. **John Warburton G4IRN** will be active from the Seychelles (S7, AF-024) from 13 to 16 September, Mayotte (FH, AF-027) signing FH/G4IRN from 16 to 23 September and the Seychelles again from 23 to 27 September. John will operate mainly c.w.

using 100W to a vertical antenna and should be found on all bands from 7 to 28MHz depending on h.f. conditions. Please QSL via G4IRN.

QSL GALLERY

A collection of over 1500 QSL cards is available on Les Nouvelles DX website. Five different galleries include cards for each of the 58 deleted DXCC entities, obsolete prefixes, Antarctic bases & Terres Australes and Antartiques Francaises (TAAF) along with pre-1945 countries. A few cards are still needed to complete the collection and your help would be appreciated, so take a look at <http://LesNouvellesDX.free.fr> and send any comments to Les at DX@free.fr

INTERNATIONAL HF AND IOTA CONVENTION

This year's RSGB 'International HF and IOTA Convention' takes place at the Britannia Country House Hotel, Didsbury, Manchester over the weekend of 31 October to the 2 November. The hotel is located close to Manchester International Airport and as usual there will be a wide variety of open forums and technical lectures covering all aspects of Amateur Radio.

Various groups will also be represented and these include The Chiltern DX Group and GQRP Club. Further details and programme updates can be found at www.rsgb.org/hfc/ or call the RSGB on (0870) 904 7373.

YOUR REPORTS

Early bird' **Mark Taylor G0LGJ** in Dereham was operating mobile s.s.b. again concentrating on the 7MHz band and worked 22 countries outside of Europe. Mark's best DX included LU1ECZ (Argentina) 0238, CX7OV (Uruguay) 0239 and YV5SSB (Venezuela) at 0435 using a Yaesu FT-100 and 100W to a Pro-Am whip antenna.

All c.w. man **Ted Trowell G2HKU** on the Isle of Sheppy in Kent used a Ten-Tec Omni V and G5RV antenna to work 9M2TO (West Malaysia), OY3QN (Faroe Islands) and ZB2FK (Gibraltar) at 2000UTC on 10MHz. This band does appear to be underused by UK Amateurs and has a good deal of DX on it throughout the day, even when conditions are not at their best. Give it a try and you may just be surprised at what turns up!

THE 14MHz BAND

Conditions on h.f. have not been at their best for several months according to **Alex Shillito G2FRY** in Nottingham who managed to weed

out the following stations heard on 14MHz: C6AKU (Bahamas), D4B (Cape Verde), E21EJC (Thailand) in Bangkok, OJ3JF (Finland), V4VYK (St. Kitts & Nevis) and VP9/W6PH (Bermuda).

Also on the band was **Martyn Medcalf M3VAM** in Chelmsford, Essex, who has been working h.f. from home using a new antenna. It is a vertical called a PBX-100 and was designed specifically for portable use, but as Martin says "It could just be the antenna for you if you are restricted by space or planning conditions".

Fully assembled five bands can be operated with different configuration of coils and telescopic elements. It is self-supporting and only 2.5m high. Radials do need to be used and are supplied with the antenna.

His first contacts using a FT-897 and battery power were with Albania, Asiatic Russia, Cyprus, Finland, Greece, Latvia, Lithuania and Ukraine. Further tests on 14MHz found CT1CJJ (Portugal) 1128, SV0JD/SV8 (Greece) 1447, EW6GF (Belarus) 1512, TF8GX (Iceland) 1608, HB0/HA5BWW/P (Liechtenstein) 1802,

ES1QD (Estonia) 1916, OZ1BXN/M (Denmark) 1922, IZ5EBL (Italy) 2105, SQ9UM/P (Poland) at 2215UTC. Not bad going with just 10W s.s.b.!

Mike Baker G3SUK in Stowmarket, Suffolk, used his Icom IC-746, Carolina Windom

and 80W s.s.b. to log contacts with 4U1WRC ITU HQ Geneva 0938, 8S4C/5 (Sweden) on EU-177 at 1144, VE9/W1PO (Canada) 2023, special even station LZ03KM (Bulgaria) 2114 and HI3/KB2MS (Dominican Republic) at 2153UTC.

Meanwhile **Owen Williams G0PHY** in Biggleswade used his Yaesu FT-747, 100W and a dipole antenna to make just one contact in the IARU contest working TI1Z (Costa Rica) at 2155UTC.

In Kendal, Cumbria **Roy Walker 2E1RAF** or **G0TAK** in another suit, says "Not been terribly active of late Carl, but I had a brief bash this month in between days of 'very hot' steamboat sessions on lake Windermere. How about this for a good one? As a result of my QRP c.w. CQ call at 1411 DJ6BQ/M replied using a Yaesu FT-100D at 100W and an ATAS120 antenna.

Yuri gave his QTH as 'leaving Trier'. A short while later I heard QRX, QRX this is DJ6BQ/M. I called and chatted to Yuri who was now operating in Luxembourg as LX/DJ6BQ/M. The QSO went on until 1427UTC when both our signals started to fade. I have always been fond of /M operation and recently had the experience of working rolling /M into Europe with the Yaesu FT957 and the ATAS which belonged to **Alex G3JGP**. For a relatively small antenna it seems to work very well and I am just itching to try it again".

On the key once again was **Ted G2HKU** who worked JY9NX (Jordan) at 1900 followed by 9L1BTB (Sierra Leone), JW0HU (Svalbard), FY5LS (French Guiana) and 9K2MU (Kuwait) at 2000UTC.

THE 18 & 21MHz BANDS

Conditions on 18MHz were not so good this month with only one reporter, **Mike G3SUK** making contacts here. These were with 4J6ZZ (Azerbaijan) at 1425 followed slightly later with TA3ET (Turkey) at 1954UTC.

On the 21MHz band **Owen G0PHY** was pleased to work his first air mobile station NQ4I/AM flying at 43,000 feet on route from Portugal to Sardinia at 1030UTC.

Ted G2HKU described the conditions on this band as 'extremely poor', but found the band open for a short period later in the day. On the key at 1500UTC he found FY5LS (French Guiana) with PT2IW (Brazil) and LU3VI (Argentina) making his log around 2000UTC.

THE 28MHz BAND

The only report for 28MHz came from **Mike G3SUK** who was monitoring the band one

morning and heard/worked ZD7MY (St. Helena) at 0940UTC using s.s.b. and 80W.

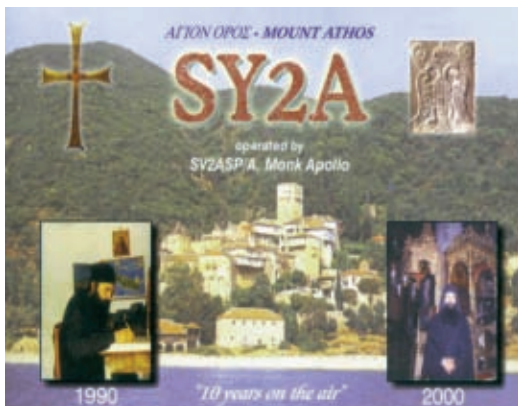
SIGNING OFF

Well, another month has flown by and h.f. conditions have been very mediocre at best! Most of the lower bands have had their fair share of DX, but the higher bands continue to be very poor. However, there is still DX to be found if you listen at the right time!

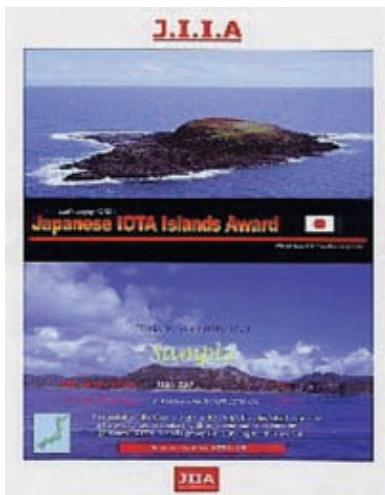
It is also interesting to see just how well some of the more simple antennas used by our reporters are working. There really is no excuse for not operating on

the h.f. bands! Finally, a warm welcome to all our Full and Intermediate Class B licensees who were automatically granted their respective Class A operating privileges to operate on the h.f. bands on 25 July. Thanks to everyone who sent in their logs and to **Tedd Mirgliotta KB8NW**, Editor of the *OPDX Bulletin* for the DX information.

73, Carl G4WVSW



● The QSL card of Monk Apollo.



● The new Japanese IOTA Islands Award - now available.

IN VISION

GRAHAM HANKINS G8EMX

17 COTTESBROOK ROAD
ACOCKS GREEN
BIRMINGHAM
B27 6LE
E-MAIL: G8emx@tiscali.co.uk

No subject has generated such a volume of 'phone calls and E-mails to committee members of the British Amateur TV Club (BATC) than the non-appearance of a BATC rally this year. Many callers were also under the impression that the club was due to hold a Biennial General Meeting (BGM) too! On the 'plus' side, BATC Chairman **Trevor Brown G8CGS** was pleasantly surprised that there was so much interest out there!

So, 'rumour control...these are the facts'! Due mainly to the lack of a suitable location at an acceptable price, the BATC has been unable to hold a traditional ATV rally this year. But, thanks to the Shrewsbury ARS, the BATC was offered a room in which to hold an Open Meeting with ATV demonstrations at the Telford

I don't know if the second Stevenage rally is happening in November, but at the moment it's unlikely that I will be going. My final 'stint' of providing an exhibition table for the BATC will probably be the two days at Donington – a rally that is usually busy, there is a lecture stream and it's easy to access and park. So, you might be seeing a new face if you come looking for the BATC table in 2004. Or not find it at all?

VIDEO ADVICE

Thanks to everyone who contacted me via E-mail with advice on video CD burning after reading of my attempts in the last In Vision. One reader even sent in screen images of the stages involved when using 'Ahead Nero' burning software.

However, I'm not sure how to respond to an

rather depressing editorial, explains the reasons for the decision to close down, concluding "our hobby is dying". **Ian Pawson**, CQ-TV's Editor agrees, with the comment: "It would seem that the desire to 'build your own' no longer applies to our hobby".

I really believe that the desire is still there, but not much opportunity! Perhaps only the really dedicated constructors would source components from catalogues any more - I can remember when I needed to mail order several distributors to find everything I needed.

Certainly the ATV kits that are around are not widely advertised, being supplied by individual Amateurs almost on a 'get to know' basis or just the occasional magazine advertisement. I have personal experience that a 'bagged up' kit will sell at rallies, where customers can take that kit away with them.

GRAHAM G8EMX STARTS OFF THIS MONTH WITH THE NON-APPEARANCE OF THE BATC RALLY

rally on 31 August. As this column had to be submitted by the end of July, I hope this event actually happened!

The BATC Constitution allows up to a three-year gap between BGMs, so the next meeting could wait until early 2005. However, it's likely that the BGM will be during 2004, but no date or venue are available at the moment. It's at the BGM where new committee officers are elected or incumbents re-elected so, whether you are happy with the present personnel or think some changes are due, start considering your vote now!

The BATC has tried to be present at many of the major rallies for the past few years, but the 'Amateur Radio rally season' is not what it once was. The days when the queue of visitors to Picketts Lock would stretch from the Great Hall and fill the service road an hour before opening are long gone – as is, of course, the Picketts Lock exhibition centre!

The replacement show at Stevenage enjoyed fabulous weather, but perhaps this enticed away many who would have come into the show? It was a similar experience at Northampton in mid-July, the marquee at Drayton Manor that the BATC was in...was quiet at 1400 hours! Frankly, for the number of active ATV enquiries I am now receiving at the BATC table, it's almost not worth the time, the travelling and the setting-up. And as for traders who have brought and must be taking back loads of stock, I cannot think how all this can be sustainable? To apply the Amateur Radio maxim: 'use or lose'?

actual letter, which arrived by Air Mail from Mauritius in the Indian Ocean (with beautiful photos of sea urchins!). **Reshad Mulling** asks for 'catalogues and brochures' (?) Well, Reshad, before I get involved in overseas posting, please clarify what exactly you want - is it CQ-TV back-issues or BATC application forms? Either write again or E-mail to my new address **g8emx@tiscali.co.uk**

The latest edition of the BATC's magazine, CQ-TV, issue 103, spans the years of television technology. There are four articles directly concerned with Digital ATV – one of these is by **Ian Bennett G6TVJ** on testing out the German SR-Systems DATV transmitter. This consists of an MPEG (Motion Picture Experts Group – the committee that sets DTV standards) coder module, multiplexing and error-correction p.c.b. then a modulator and 10mW transmitter which works on 23cm (1.3GHz) or 13cm (2.4GHz).

If you want 'retro-technology' then **Peter Stonnard's** article looks back 40 years to the 'World's Most Complex Vacuum Tube' – the Image Orthicon 4.5in pick-up tube that was almost the standard in TV cameras of the 1960s! To join the BATC and receive CQ-TV, visit the club's website <http://www.batc.org.uk>

RECENT DEMISE

With the recent demise of *Repeater*, the Dutch Amateur TV magazine, CQ-TV became nearer to becoming 'the last of its kind'. *Repeater's*, (which has been in print for the past six years), Editor **Rob Ulrich** thanks his readers but, in a

SEEING REPEATERS

Line Out, compiled by **John Stockley G8MNY**, is the occasional newsletter from the Home Counties ATV Group that maintains **GB3HV**. John, can 'see' seven ATV repeaters from his home QTH (lucky chap), except, apparently, GB3HV! Tree obstruction appears to be the problem.

Sometimes, a station monitoring a remote



- Get that 'hands-on' feeling. Kits of bits complete with paperwork, components and p.c.b. are still being assembled, but not widely advertised.

ATV repeater might be more interested in it than the local club running it! I've been known to make enquiries about a repeater, only to find that neither its keeper or anyone in the group has looked at it for ages, which has led to a change of keeper and repairs.

So be aware! You never know who's listening ... or watching! That's all for this month, so until next time keep 'in vision' and don't forget to let me know of any interesting ATV news you come across.

Graham G8EMX

Give your Repeater Worldwide Coverage with WIRES™-II



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Extend the range of your transceiver using Wires II VOIP technology from Yaesu. The Wires II controller (HRI-100) connects between your VHF or UHF ham transceiver and your home computer with an internet connection.

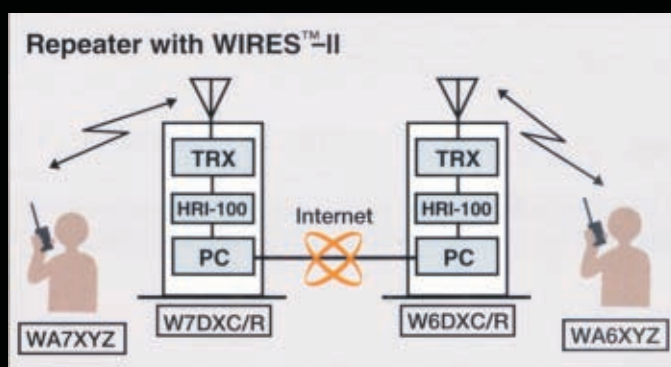
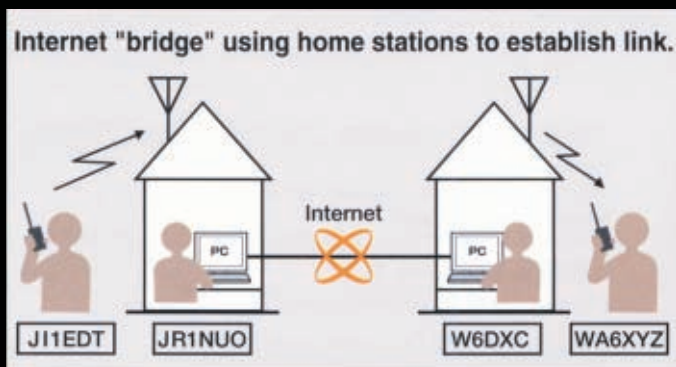
Using DTMF tones to access the controller, you can connect to any one of the hundreds of other radio amateurs across the world who have connected to the Wires II server.

Wires II also introduces two unique networking modes for radio-internet linking.

SRG - 'Sister Radio Group'. A group of up to 10 repeaters or stations that have agreed to form a closed group. Access to all stations in the SRG is accomplished by a single DTMF tone at the start of the first transmission. Ideal for internet linking between one or more repeaters within the UK.

FRG - 'Friends Radio Group'. Repeater stations around the world, as they register on the Wires II Host Server become part of the FRG and users may receive a call from anyone operating on any one of the repeaters anywhere in the world.

Call your Yaesu Dealer Now!



Additional requirements apply to the use of Wires II in the UK and elsewhere. 200MHz PC, 64MB Ram, 30Mb Hard Disk, Win98 or later, Sound Card with 44.1Khz sampling. An Internet connection (>56K Dial up, ISDN, DSL are OK) is also required, and users are required to sign and agree to the Vertex Standard End User Licence Agreement before a wires ID code can be issued. Full details are available online at www.yaesu.co.uk. UK Users must be in possession of a NOV for Internet Linking. Other users should check their local licencing requirements.

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DATA BURST

ROBIN TREBILCOCK GW3ZCF

15 BROADMEAD CRESCENT

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SWANSEA

SA3 3BA

TEL: (01792) 234836

E-MAIL: robin2@clara.co.uk or gw3zcf@qsl.net

Firstly, I must apologise to those of you who tried to contact me at my old e-mail address. For various reasons it was necessary for me to change to a different ISP, but the change took place after the last article had gone to press.

However, it does give me the opportunity to tell you about a very useful e-mail forwarding service operated by **Al Waller K3TKJ**.

From Al's website at **www.qsl.net** you can have an e-mail address based upon your callsign (mine is gw3zcf@qsl.net) and any e-mail sent to that address will automatically be forwarded to your nominated ISP. The advantage is that if you change your ISP, you don't have to send a new e-mail address to all your friends – just change the registration details at qsl.net

A similar e-mail forwarding service is operated by the ARRL for its members, but the qsl.net service is absolutely free to all licenced Amateurs. Because Al K3TKJ has to have massive servers for all the services he provides free to the Amateur community, he does invite voluntary contributions, \$10 is suggested, and this can be paid on-line using your credit card.

The moral is that, had I quoted my qsl.net address at the head of the Data Burst column, I

would not have lost the e-mails you sent to my old address!

DECODERS FOR CW

When we talk about digital modes, we usually mean those where the text is entered using a typewriter keyboard. But of course, one of the oldest digital modes is c.w., using the Morse Code.

When I first became active in Amateur Radio in 1952 it was necessary to serve a 12 month apprenticeship on the 'key' before

Morse test, and although I never became a really fast operator, I still get pleasure from using the key from time-to-time. I am more comfortable using an old-fashioned straight key, but I am trying to improve my skills with the automatic keyer that is built into my transceiver.

Although it might offend the purists, I sometimes use a c.w. decoding program to help me copy Morse which is too fast for my ageing grey cells to keep up with! It's fun to pit oneself against the program to try to build up

ROBIN TREBILCOCK GW3ZCF TAKES HIS TURN IN ROUNDING-UP LOTS OF INTERESTING DATA NEWS

being allowed to progress to a microphone. In fact, 15 years elapsed between passing the RAE and actually taking out my licence and by that time the requirement had been waived!

Nevertheless, I had to take a 12 w.p.m.

the speed, and any M3 who wants to try his hand at learning Morse code could do worse than to tune-in to a station sending good code and try to keep up with the software.

There are several decoding programs available, all of which are very effective with accurately sent code. I have mentioned *MixW* before and this software has an awesome selection of modes available, including a a very effective c.w. setting.

MixW will also transmit perfect Morse at any desired speed if you type it into the keyboard. The computer generates an audio tone and if your rig is on the s.s.b. setting this is transmitted as c.w. (on most rigs, this means that you lose the benefit of the narrow c.w. filters when you switch back to receive – a problem which does not arise if you only use the software for receiving Morse).

The second program is shareware, called *CWGet*, and is written by **Sergei Podstrigailo UA9OSW**. *CWGet* is a very simple, but effective, program for reception only. Morse decoding programs are very unforgiving, and will refuse to read badly sent Morse. *CWGet* will only leave spaces between words if they are there in the first place!

The third decoding program for c.w. is freeware called *Multipsk* by **F6CTE**. This is relatively recent and, in truth, I don't find the appearance on screen to be very user-friendly.

No doubt the rough edges will be smoothed off in time, but the c.w. decoding function is excellent. Morse is accurately printed on the screen when only just audible above the noise – I was very impressed. *Multipsk* will also send Morse, though I haven't tried it.

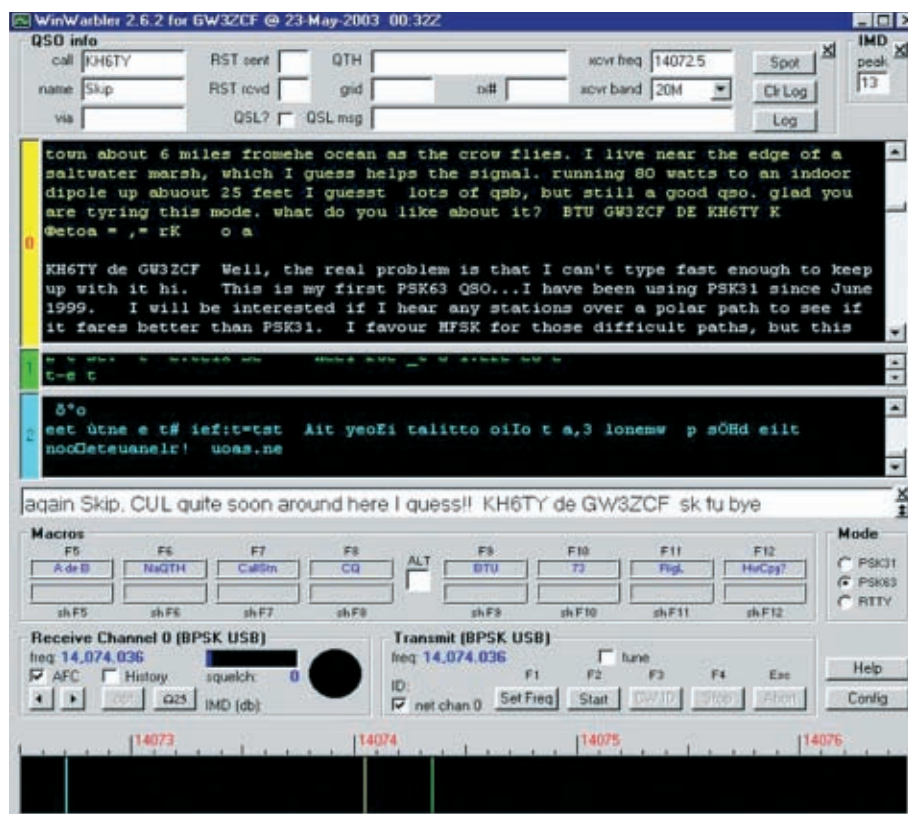


Fig 1: Screenshot of Robin's first PSK63 QSO (see text).

NEW - PSK63!

There has been quite a lot of interest in the last few weeks in a new mode, PSK63. It's very similar to PSK31, but has more a powerful error correction (which should make it more robust over polar paths). Although it has twice the bandwidth of PSK31, it's capable of sending text at 100 w.p.m. (as compared with RTTY, which can manage 60 w.p.m. and occupies five times more bandwidth). It's also claimed by its originators that it has better sync recovery than RTTY and requires far less power for similar communications performance. Time will tell!

There are not many programs for PSK63 yet, but the number is growing almost daily.

Other software which will now run PSK63 include the latest version 2.13 of *WinPSK*, *Multipsk* by F6CTE, and *MixW 2.08*. For *MixW*, you have to write a macro `<BAUDRATE:62.5>` which will automatically switch the software from PSK31 to PSK63.

There is a new program called *PSK31 de Luxe*, by **HB9DRV** (formerly GD8IQM) which also runs PSK63. I haven't downloaded this one yet, so if you try it, please let me know how you get on.

SOUNDCARD SETTINGS

How often have you configured the soundcard settings on your PC and got them exactly right for digital radio, only to find that one of your

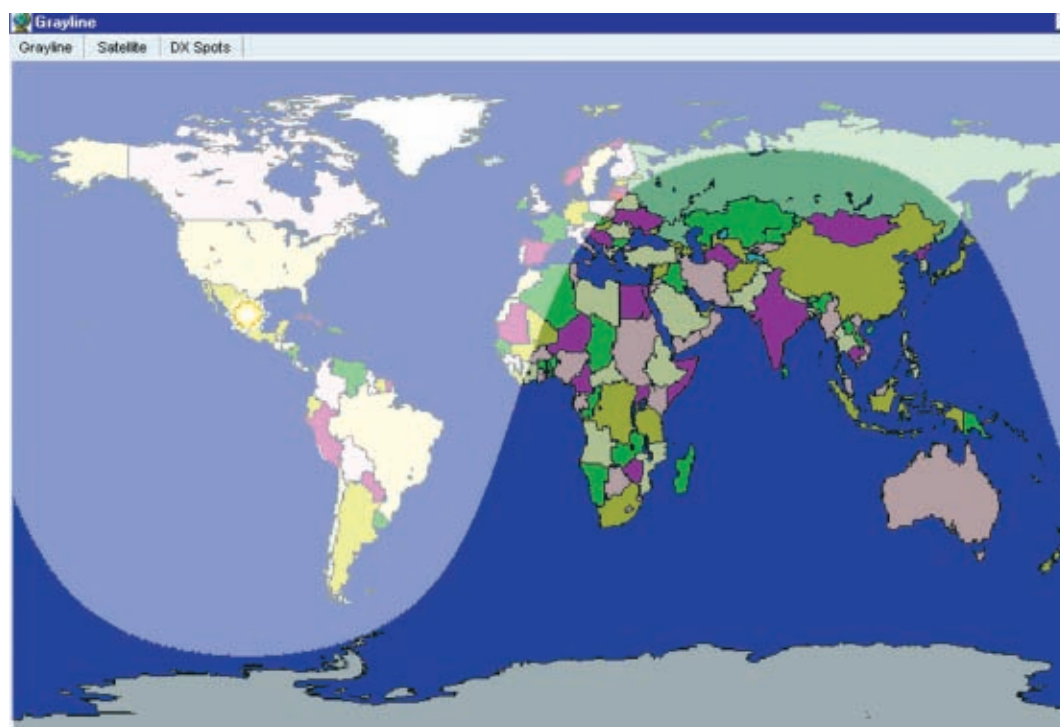
Burst. One very nice feature is to display the grayline (boundary between daylight and darkness) in real time on a map of the world. **Fig. 2** shows the grayline just before dusk at my QTH in July.

The image of the sun shows that it was midday somewhere over Central America at the time. Often good DX openings occur for paths near the grayline, so this map can give you a good idea of where to look. In fact, at the time I took this screenshot, I was receiving strong signals from Antarctica and South America.

You will notice 3 tabs on the screenshot window. By clicking on Satellite you can see the position of many well known satellites,

including those used for Amateur Radio (and when you are connected to the web, the software can download the latest Keplerian elements to keep the calculations spot on).

The tab labelled DX Spots is not coded yet (*Logger32*, although now on public release, is still at the beta stage). When it's fully functional it will, if you are connected to Telnet, display the locations of incoming DX stations as they appear in the Telnet window. This will be a very useful feature for displaying clusters of DX activity.



● Fig 2: A chart illustrating the "Grayline" effect (see text).

The first that I heard of was *WinWarbler*, and so I updated my earlier version and tried a CQ call on 14074kHz (the recommended area for PSK63 is just above the regular PSK31 activity). My first call was answered by **Skip KH6TY**, joint author of *Digipan* and one of the originators of PSK63. We had a long and interesting QSO, and I have since met Skip several times on that frequency. A screenshot of that first QSO is shown in **Fig. 1**.

Skip has released his own experimental software for PSK63 called *QuikPSK*. This can display 24 simultaneous PSK63 channels, and Skip says that it would really come into its own in contests, where you could see all the activity at the same time. In fact, it may well be that contest operation will be PSK63's greatest strength.

The speed of text transmission lends itself to the snappy exchanges favoured by many (but not by your scribe!). My typing speed won't keep up with PSK63, so in that respect I don't get the full benefits that it offers over PSK31.

children has been using the computer to play pop music and all the settings have been lost? For some years I have been using a simple freeware program called *QuickMix*.

Once you have all the settings as you want them, open *QuickMix* and you can store them as a document file under whatever name you choose (you can store different combinations of settings for different purposes). Then, if you lose them for whatever reason, it's a moments work to open *QuickMix* and reload them so that your system is once again exactly as you left it. It's a very small program which only performs this one simple function, so the download time is very short and I would thoroughly recommend it.

MORE ON LOGGER32

I first wrote about *Logger32* in the July Data

HELLSCHREIBER FOOT-NOTE

Following my piece about Hellschreiber in July, I had a card from **Godfrey G4GLM** who pointed out that, although Hellschreiber is named after its inventor **Dr Rudolph Hell**, it translates from German to English as Clear Writer. What a delightful coincidence!

LINUX

I can't wait to see **Tex Swann G1TEX/M3NGS'** piece on Linux in November Data Burst. My son, who is far more computer literate than I, has urged me on many occasions to try it. I have had one or two half-hearted attempts, but never really got to grips with it. There is a lot of very good free software available for Linux, so I shall read it with interest.

73 Robin **GW3BC7**

Useful URLs

Program	URL Address
Multipsk	http://members.aol.com/f6cte/index.htm
CWGet	http://www.dxsoft.com
Quikpsk	http://www.qsl.net/kh6ty/psk63/
QuickMix	http://www.msaxon.com/quickmix/
WinWarbler	http://www.qsl.net/winwarbler
PSK31 de Luxe	http://www.hb9drv.ch/

RADIO

42 Brook Lane, Great Wyrley, Walsall

Phone: 01922 414796 F

E-mail: sales@radioworld.co.uk Web: www.radioworld.co.uk

ICOM



IC-2725E



IC-756PROII



IC-703

KENWOOD



TS-2000



TS-570DGE



FT-847



YAESU



FT-1000MP



FT-817



FT-920AF



FT-857

MFJ



MFJ-259B



NES10-2



MFJ-949E



NEIM-1031

ALINCO	MODEL	PRICE
DX-701	£629.00
DX-70TH	£599.00
DX-77	£499.00
DR-610	£369.00
DR-605	£269.00
DJ-G5E	£265.00
DR-150	£269.00
DJ-X2000	£449.00
DJ-X10	£249.00
DJ-V5	£239.00
DR-M06	£229.00
DJ-C5	£189.00
DJ-195	£169.00
DJ-193	£139.00
DJ-X3	£115.00
DR-135	£229.00
DJ-496	£175.00
EDX-2	£299.00
DJ-X2	£165.00
DR-140	£219.00
DJ-596	£199.00
DJ-C1	£99.00
DJ-C4	£99.00
DR-M03	£239.00
DM-330MVZ	£129.00

ICOM	MODEL	PRICE
IC-756ProII	PHONE
IC-7400	£1,299.00
IC-910H	£1,100.00
IC-706MkIIIG	£789.00
IC-703	£575.00
IC-718	£449.00
IC-2725E	£299.00
IC-207H	£275.00
IC-2100H	£225.00
IC-E90	£269.00
IC-T3H	£129.00
IC-R8500	£1,199.00
IC-R75	£599.00
IC-PCR1000	£329.00
IC-PCR100	£229.00
IC-R3	£369.00
IC-E90	£269.00
IC-R10	£275.00
IC-R5	£169.00
SM-20	£125.00
SP-21	£69.00
AT-180	£329.00
FL-100	£59.95
FL-103	£59.95
FL-223	£59.95
FL-232	£59.95

KENWOOD	MODEL	PRICE
TS-2000X	£1,800.00
TS-2000	£1,550.00
TSB-2000	£1,499.00
TS-870S	£1,299.00
TS-570DGE	£829.00
TS-60S	£599.00
TM-D700E	£429.00
TM-V7E	£375.00
TM-G707E	£279.00
TH-D7E	£299.00
TH-F7E	£249.00
TH-G71E	£210.00
RC-2000	£199.00
PS-52	£229.00
TM-53	£229.00
PS-33	£199.00
MC-60A	£110.00
MC-80	£69.95
SP-31	£82.00
SP-23	£68.95
SP-50	£27.95
YK-88C-1	£61.95
YK-88S-1	£61.95
YK-88SN-1	£61.95
YK-88CN-1	£61.95

MFJ	MODEL	PRICE
MJF-16010	£56.95
MFJ-989C	£379.95
MFJ-986	£349.95
MFJ-934	£189.95
MFJ-924	£74.95
MFJ-921	£74.95
MFJ-969	£199.95
MFJ-914	£64.95
MFJ-962D	£279.95
MFJ-949E	£159.95
MFJ-910	£24.95
MFJ-906	£89.95
MFJ-948	£139.95
MFJ-903	£54.95
MFJ-945E	£119.95
MFJ-941E	£129.95
MFJ-901B	£85.95
MFJ-212	£79.95

YAESU	MODEL	PRICE
FT-1000MkV	£2,400.00
FT-1000MkV-FIELD	£1,899.00
FT-847	£1,145.00
FT-920	£1,049.00
FT-897	£985.00
FT-857	£795.00
FT-817	£549.00
FT-840	£499.00
FT-8900R	£339.00
FT-7100M	£299.00
FT-2800M	£179.00
FT-1500M	£159.00
VX-7R	£299.00
VX-1R	£115.00
VX-150	£110.00
VR-5000	£549.00
FRG-100	£399.00
VR-500	£199.00
VR-120D	£159.00
VR-120	£139.00
MD-200A8X	£225.00
MD-100A8X	£99.00
FC-10	£299.00
FC-20	£225.00
FC-30	£229.00

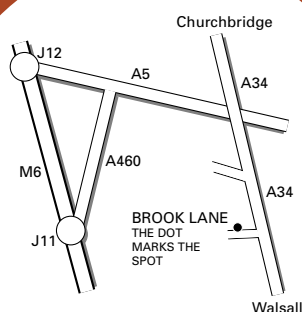
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ADI	AT-800D	Dual Band Handheld Transceiver.....	£129.00	JRC	NRD-L2000	1KW Linear Amplifier Solid State (VERY RARE!!!).....	£1,600.00	Timewave	DSP Filter.....	DSP Filter.....	£225.00
Adonis	AM-805G	Desk Microphone, with Built In Compressor, and VU Meter.....	£70.00	Kamtronics	KAM	Multimode TNC.....	£140.00	Tokyo	HL-30V	2m - 25W Amplifier.....	£75.00
AEA	MM-3	Morse Machine.....	£30.00	Kent	RA	Morse Paddle Key.....	£40.00	Tokyo	HL-35V	2m Power Amplifier with Pre-Amp.....	£39.00
AEA	PK-232MBX	TNC.....	£125.00	Kenwood	BC-15	Rapid Charger.....	£35.00	Tokyo	HL-37V	Linear Amplifier.....	£60.00
AEA	PK-900	TNC.....	£200.00	Kenwood	DM-81	Dip Meter Including Coils.....	£55.00	Tono	MR-150	150 Watt 70 cms Amplifier.....	£175.00
AEA	PK-96	TNC.....	£90.00	Kenwood	HS-5	Headphones.....	£25.00	Tono	T-777	Communications Terminal.....	£120.00
AKD	6001	6m FM Transceiver.....	£135.00	Kenwood	LF-30A	Low Pass Filter.....	£30.00	Tono	4M-70G	60 Watt UHF Transceiver, Including Pre-Amp.....	£119.00
ALAN	HG-2000	2W 28 - 30MHz SWR / Watt Meter.....	£25.00	Kenwood	MC-80A	Desktop Microphone.....	£70.00	Transverter	QM-70	28144 Transverter.....	£100.00
Alnico	DJ-GSEY	Dual Band Handheld.....	£199.00	Kenwood	MC-80	Desk Microphone.....	£40.00	Trident	TRX-200	Latest Scanner.....	£175.00
Alnico	DJ-X10	Wide Band Receiver.....	£200.00	Kenwood	MC-85	Desk Microphone.....	£35.00	Trio	TM-201A	2m Mobile Transceiver (Complete with Detachable Front & Speaker).....	
Alnico	DJ-X3	Handheld Scanner.....	£99.00	Kenwood	PS-10	Power Supply for TR-9130 etc.....	£135.00	Trio	TR-9000	2m Multimode.....	£199.00
Alnico	DR-150	2m Transceiver with Air-and Receive.....	£150.00	Kenwood	PS-31	Power Supply (TS-870, TS-850, etc).....	£135.00	Trio	TR-9130	2m All Mode Transceiver.....	£250.00
Ameritron	QSK-5	Amplifier Switch / Pre Heat.....	£200.00	Kenwood	PS-430	Power Supply.....	£100.00	Uniden	UBC-860XLT	Base Scanner / Receiver.....	£99.00
AOR	AR-7000	Top Receiver.....	£550.00	Kenwood	PS-50	Power Supply.....	£145.00	Watson	Hunter	Frequency Counter.....	£40.00
AOR	AR-7000+	HF Receiver.....	£625.00	Kenwood	R-5000	Receiver.....	£499.00	Watson	W-D830	Dualband Amplifier.....	£89.00
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There are two international radio 'punch-ups' to report on this month. With a name like **Radio for Peace International** (RFPI), you would not expect to hear that the station has armed guards posted at the doors, with chains on its access gate, and an eviction notice served by its host organisation, which is supported by the United Nations. But, at time of writing, that was the case.

Radio for Peace International has been operating from the campus of the University for Peace, El Rodeo, Costa Rica, since 1987. The

of Peace.

A group of entrepreneurs, which includes members of the Kibbutz Movement, left-wing Jewish activists and Palestinian businessmen, have announced that the Voice of Peace radio, closed in 1993, will start broadcasting again from Ramallah on 4 November 2003. The station says it has been allocated a frequency by the Palestinian Authority's Ministry of Communications.

However, the announcement has infuriated those close to the original station's founder, **Abie Nathan**. The original Voice of Peace (VOP), a

choices at the top right of the pages: all you'll get is a harangue about the 'Cuban Five' who are claimed to have been wrongfully arrested by the ancient enemy - the USA.

Choose the 'radio button' (circle) marked English, and you find the wide range that this station broadcasts - world and local news, culture and sport figure highly. There's plenty of text news on the Internet pages and two audio sources available, but when I tried them, there was silence on one of them, and Portuguese on the other.

In theory, English is available on 'Broadcasting 1' between 2100-0300. Better to try old-fashioned short wave at: 0100-0500 on 6.000, 9.820; 0500-0700 on 9.550 and 9.820; 2030-2230 on 9.550, 13.660 and 13.750MHz. Most transmissions are directed guess where - yep, to the United States. But the 2.030MHz is intended for Europe. A friendly station, but a bit chaotic in its arrangements.

TOM HAS NEWS OF TWO INTERNATIONAL RADIO PUNCH-UPS AND A SPOT OF JAMMING

station was constructed and allowed to operate with the full permission of the university. The move to evict RFPI at two weeks' notice by a new university administration is unexplained, and according to Chief Executive Officer of RFPI **James Latham**, legally questionable.

Radio for Peace International has been broadcasting messages of peace and social justice, as well as daily United Nations programming. Latham says that the new bosses at the university have shown poor judgement.

"What is most shocking and sad is that this action comes from an international peace organisation. Our shared goals to work toward ending war is what brought our two organisations together, and in the world today there is still much work to be done. Instead of focusing on how to eliminate a fellow peace organisation, we need to channel our energy toward eliminating war, poverty and hunger". Which seems uncomfortably obvious.

You can find the latest news at www.rfpi.org where you can also sign a petition. The Committee for the Defence of Radio For Peace International encourage you to write to the UN Secretary General **Kofi Annan** in support of the radio station at: annan@un.org or sg@un.org and/or to leave a message of concern with the Public Inquiries office at 212.963.4475.

Radio for Peace International's schedule was, and hopefully still is: 0000-2400 on 15040 and 2100-1300 on 7.445MHz.

PROPOSED REVIVAL

The second ruckus involves another station with a peaceful-sounding name. This time the setting is Israel. The row is not about the closure of **Kol Israel**, but about a proposed revival of the **Voice**

non-political humanitarian station, was broadcast from a ship outside Israeli territorial waters. Israeli journalist **Mike Brand**, a friend and confidante of Abie Nathan, says that the new group calling themselves the Voice Of Peace have no legal right to use the name and its jingles.

Mike Brand says the new group want their station to be political, whereas Abie Nathan's supporters are working on an alternative plan which avoids politics altogether, and adheres to the format of the old VOP, with a humanitarian slant.

SPOT OF JAMMING

There's a spot of jamming going on in the international TV world - with the USA accusing Cuba of 'deliberately and maliciously' interfering with transmissions to Iran. Quite why a communist country like Cuba should take an interest in the affairs of a religious state such as Iran is not clear. Perhaps just to spite the USA?

What better excuse than to take a look at the Cuban international radio **Radio Havana Cuba**. Broadcasts are in Creole, English, Esperanto, French & Portuguese. The website is www.radiohc.cu We're in a different and more aggressive world here. Beware the language

FIVE CONTINENTS

A little further round the Caribbean Sea, brings a quick stopover at **Radio Mexico Internacional** (RMI). As with Havana, transmissions are mainly intended for North and America and the Caribbean, but it's worth trying to hear their

English service elsewhere. There are just two 10kW transmitters and two frequencies 9.705 and 11.770MHz, with 11770 being the better bet.

The claim is that with these slender resources RMI can reach the

"Five continents: America, Europe, Asia, Africa and Oceania". Transmission periods for English are at 0400-0430, 0500-0530, 1500-1530, 1600-1630, 2200-2230 and 2300-2330.

Information on the website is not RMI's strong point. Everything is in Spanish, and has the rather bureaucratic flavour of the government enterprise that it is. The site is a bit ramshackle - not everything works. Try <http://hello.to/rmi> (not on-line when I tried) or www.imer.gob.mx which was working, up to a point.

Finally, this brings us, geographically, round in a circle, back to Radio for Peace International in Costa Rica. Let's hope that they can shake off the armed guards soon and resume their peaceful trade.

Bye for now, Tom



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Marconi TF-2950 mobile radio test set, I'm told its worth £700 - will take £500 o.n.o. Oscilloscope, offers, 70cm beam, £15. Rotator with control unit, £25. Steve 2E1GFS, Taunton. Tel: (01823) 279930 or (07743) 939922.

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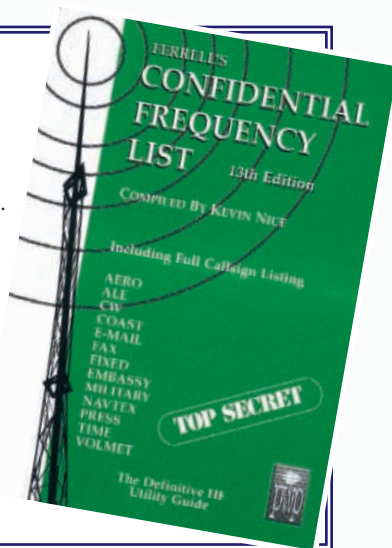
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topical**talk**

Eamonn's Determination

- Triumph over adversity...and on the air with a lot of help from his friends! Eamonn Kavanagh EI3FBB poses in front of part of his antenna system.



This month Rob Mannion G3XFD shares the story of Eamonn Kavanagh EI3FFB who passed his RAE after many attempts. His determination was backed by the friendly support of the Tipperary Amateur Radio Group.

Many readers will know that I'm proud to be very closely associated with three Amateur Radio Clubs in Ireland - the **Tipperary Amateur Radio Group** (TARG), the **Mayo Radio Experimenters Network** (MREN) and the **Bangor & District Amateur Radio Society** (B&DARS) in County Down. I'm fortunate to have many friends through *PW* within that green land...but one friend stands out in a very special way and I'm delighted with his progress in Amateur Radio.

Eamonn Kavanagh who is now **EI3FFB** was one of the first members of TARG I got to know well...keeping me well supplied with Irish railway souvenirs. When I first became a regular visitor to the club, meetings were held in the historic town of Cashel...not so far from Eamonn's farm. He's in a marvellous situation as far as I'm concerned...right out in the country with mountains as a backdrop. The family farm is alongside the main Rosslare-Waterford-Limerick railway in the village of Bansha...and he's got plenty of room for his antenna farm and takes full advantage!

It's only recently I finally managed to stop off to

visit Eamonn - despite travelling the road between Waterford and Limerick on many occasions. On this trip however, I managed to stop by to be welcomed by Eamonn...and was truly astounded when I saw the E13FFB antenna system.

With towers as high as 30 metres carrying h.f., v.h.f. and u.h.f. antennas, this Amateur is going places...but it's not been without a struggle. And with his full permission and co-operation I'm pleased to share this success with you.

Special School

Eamonn is very open about his educational difficulties and explains that he attended what is now called 'Special School' when he was around nine years old. This was because he was - and still is as he says - "somewhat slow" in some areas of understanding.

However, speaking for myself...although this slim, tall, and willowy character certainly seems to have to work hard at what many of us take for granted, he makes an immediate impression. For a start he's incredibly keen and although Eamonn really struggles to write a letter...he does so effectively.

Eamonn's work as a farmer is also very impressive as he and his brother - overseen by their mother from their delightfully situated farmhouse - run two farms! And despite any disability he's

considered to have...our
Scottish readers would
say he's "Canny". Indeed
he's no fool...especially
on the money
management side and
I'm sure he could teach m

For many years Eamonn struggled to cope with the complexities of radio, but he persevered. His own struggles were - and still are - backed by the very great support of the TARG members. In fact, I can confidently say that without the support and help from his club...Eamonn would still be struggling to pass the full RAE...and he's the first to mention that fact.

Club Support

In fact, Eamonn EI3FFB's success is direct tribute to his own determination and a reminder of the importance of the support from clubs who help potential Amateurs along the way. So, my salute goes to both TARG and Eamonn himself. His next goal is to be active on h.f. and I'm sure he'll succeed very soon.

If you're ever on the road to Tipperary...be prepared to stop off in the village of Bansha. You'll find a remarkable Radio Amateur and receive an equally special welcome. I did....and I hope to return very soon!

PW

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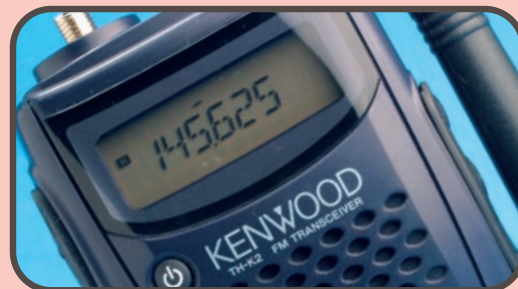
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Building on the tremendous success of the 200-Watt FT-1000D and MARK-V FT1000MP Elite-Class HF Transceivers, the MARK-V Field brings this leading-edge technology to you in a 100-Watt HF Transceiver with a built in AC power supply.



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