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amateur radio & more!

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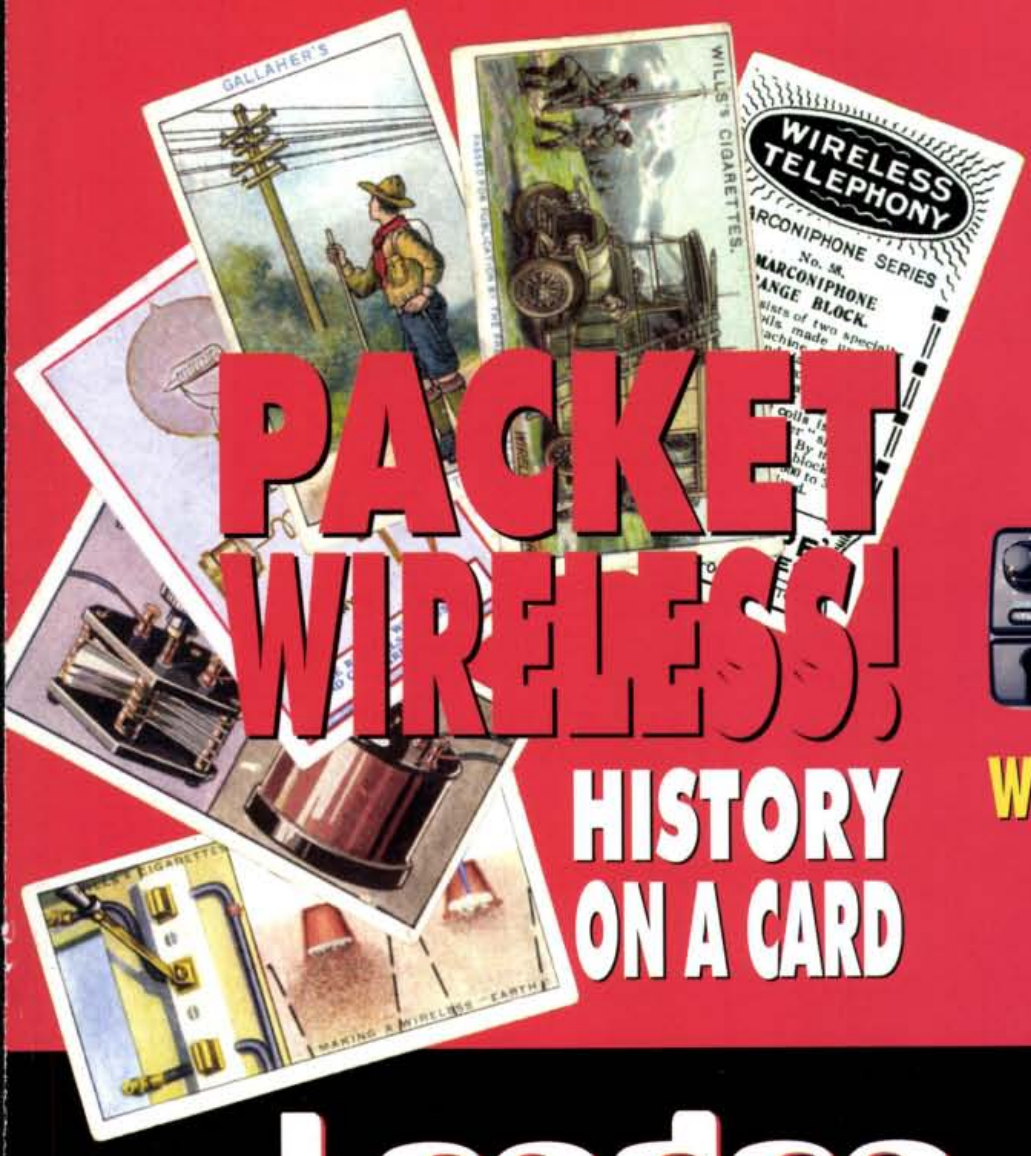
G3XFD says "It's full of bargains"

ON AIR WITH 'ANDY' THE LIGHT



PACKET WIRELESS!

HISTORY ON A CARD

WIN AN ALINCO DX-70

London SHOW GUIDE

JOIN THE PICKETTS LOCK PARTY!

March 2000 £2.50

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Waters & Stanton PLC

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FREE BASE MIC

SAVE

1.8 - 52MHz 100W
Auto ATU 51 Bandwidths

IC-756PRO

- New DX Rig
- 5" Colour Screen
- 32 Bit DSP
- 51 Bandwidths
- RF Processing
- Voice Memory
- CW memory

Phone

Real-Time Spectrum Scope

19.4% APR Available

The new IC-756PRO has arrived at Icom's top UK dealer. And of course you get best value from Waters & Stanton, whether it be part exchange, pre-sale or after-sale advice and technical assistance. This feature packed radio sets a new standard in HF operation and convenience and for the first time you can send and receive RTTY on the LCD screen. A new mode with no external boxes. Make no mistake, this is a very advanced transceiver, one that needs top dealer support that only comes from W & S. So give us a call and we'll send you the latest information.

KENWOOD **TS-870DG** 160 - 10m All Mode

~~£1999~~ SAVE

Crazy Price! £1499

The TS-870 is one of the most advance HF transceivers available today. And at our offer price it is a real bargain. Extensive use of digital techniqes makes this an amazing machine. Send for leaflet.

£849

TS-570DG 160 - 10m All Mode

One of the best buys around, this is a real beauty with a receiver that is unsurpassed. Send for leaflet.

PSU Offer PS-53 £225 PS-33 £139

ICOM **IC-746** 160m - 2m All-mode

or pay 10% Deposit and balance in 6 months Interest FREE

£1349 SAVE

The IC-746 offers 100 Watts of RF out on all bands from 160m to 2m. We rate it as one of the best value-for-money packages around.

YAESU **FT-840** 160 - 10m All Mode

£589 SAVE

The FT-840 offers 100 Watts of well engineered RF together with a receiver that can more than hold its own.

FT-90R Can you believe the size?

£325

The tiny dimensions of the FT-50R from Yaesu, are hard to believe. Yet it produces 50W on 2m and 35W on 70cm. Auto repeater shift on UK channels and switched 12.5 / 25kHz deviation, make this a number one choice.

YAESU **FT-1000MP** 160 - 10m All Mode

Super Discount Phone!

19.4% APR Available

It has stood the test of time and used by the worlds top DXers and DXepeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts. AC and DC versions in stock.

SAVE

ICOM **IC-706IIG** 160 - 70cm All Mode

19.4% APR Available

or pay 10% Deposit and balance in 6 months Interest FREE

£989

£1069 with switch mode power supply

Next Day Delivery £7.00

Shown above with PSU

The IC-706II G is the latest model of this classic transceiver. Great for mobile, portable or base use. Its got a great pedigree and offers 100 Watts on all bands up to 50MHz with 50 Watts on 2m and 20 Watts on 70cm. CTCSS encode and a lovely display with removeable front panel.

TUNE CONTROL Plugs into back of your IC-706. Now when you press "tune" you get 10W of RF for tuning up via manual ATU etc. A lovely idea that costs you only £29.95

ALINCO DJ-190E 2m Handheld

A compact 2m handheld that is offered at a new low price. Wideband receiver 135 -174MHz, CTCSS encoder and 1750Hz tone burst. Includes battery and AC charger. (4/8V DC700mAH Ni-Cad battery standard.

£119

1.5W (4.8V), FM (F3E), 40 memories, 6 channel steps, Auto power off, Battery save function, Time-out timer.

YAESU **FT-847** SAVE

160 - 70cm All Mode

or pay 10% Deposit and balance in 6 months Interest FREE

£1349

£1379 with switch mode power supply

Next Day Delivery £7.00

PRICE MATCH

The FT-847 has firmly established itself as a true all-band, all-mode transceiver. Loved by the VHF & UHF operators, and superb for satellite operation, it also offers great HF performance. We have sold more than any other dealer, which says a lot about our reputation and our price. Phone for free leaflet today. And remember, our stock is genuine UK, not modified overseas models!!

Price Increase - *We have had to increase the "847" price slightly. However, there is a further price increase likely - so now is the time to buy!!* ***BE WARNED***

YAESU **FT-100** 160 - 70cm All Mode

~~£995~~ Phone

See RadCom Review

This this rig is the smallest all-bander available. We have used it extensively and it is absolutely great. Read Radcom's in-depth review and then come to us for the best deal around.

YAESU					
FT-840	HF 100W	£589.00	YF-114SN	FT-1000 2.0kHz Fil.	£84.00
FM Unit	For FT-840	£56.00	XF-117C	FT-100 500Hz Fil.	£98.00
YF-112C	FT-840 500Hz filter	£84.00	YSK-100	FT-100 Sep. Kit	£56.00
FC-20	Auto ATU	£199.00	FT-3000M	2m Mobile	£295.00
YF-114CN	FT-1000 250Hz Fil.	£84.00	VR-500	Scanner	£249.00
			FT-920AF	HF 100W	£1149.00

We will Beat Competitor's Prices By up to £100

On genuine UK Stock

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Check - www.waters-and-stanton.co.uk

ADI AT-600
Dual Bander
Airband Rx

£199

- 2m & 70cm Handheld
- 5W Output on 13.8V DC
- Full CTCSS & 12.5/25kHz Steps
- 110 Alphanumeric Memories
- 29 Programmable Functions
- DTMF Keypad & AM Airband
- Ni-cads & AC charger

NEW

Kenwood TM-700DE
2m / 70cm Data Mobile

£459

SAVE

Just arriving, this new model has built-in TNC, port for GPS, Data connector for SSTV, RTTY etc., CTCSS/DCS, Switchable TX/RX deciation, Dual receive, Wide receive option, Detachable head unit, 50 Watts on 2m, 35 Watts on 70cm, 200 memories, Alpha tag memo capability and a lot more. And who has the best price? - look no further!

Hoka Decoding Software

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission. Simply connect between PC and Rx audio. Can be loaded on any number of PCs. This is a very advanced programme.

£349.95

C-150 2m Handy

- 2m Handheld
- 5W Output on 13.8V DC
- 1750Hz Tone Included
- 25 / 12.5kHz Steps
- 20 Memory Channels
- Wideband Receive
- Uses 6 x AA cells (not inc.)

£99.95

YAESU VX-5R

~~£330~~

- 6m / 2m / 70cm Handheld
- 5W Output on 13.8V DC
- CTCSS Encode / Decode
- 25 / 12.5kHz Steps
- Auto Repeater Shift
- AM Airband Receive
- Lithiun Cells & Charger

YAESU FT-50R

~~£220~~

- 2m / 70cm Handheld
- 5W Output on 13.8V DC
- CTCSS Encode / 1750Hz tone
- 25 / 12.5kHz Steps
- 30 Memory Channels
- AM Airband Receive
- Ni-cad Cells & Charger

SAVE

C-408 70cms Handy

Normally £89.95

£69.95

- CTCSS
- Repeater Shift
- Digital Display
- 12.5 / 25kHz Ste
- 20 Memories
- 230mW Output
- Uses 2 x AA

NEW

Offer Extended

CD-100 MULTICOUNTER

Reads Frequency & Codes

Range: 10MHz -1GHz
Memory: 100 Channels
Decode: CTCSS, DCS, DTMF, LTR.
Power: Internal ni-cad battery
Charger included

£379.95

KENWOOD TH-D7E

~~£299~~

- 2m & 70cm Handheld
- 6W Output on 13.8V DC
- CTCSS & 1750Hz Tone
- Built-in Packet Modem
- 200 Alphanumeric Memories
- DTMF Keypad & AM Airband
- Ni-cads & AC charger

ICOM IC-T81E

~~£399~~ Phone

- 6m / 2m / 70cm / 23cm Handy
- 5W Output on 13.8V DC (1w23cm)
- CTCSS & 1750Hz Tone
- 12.5 / 25kHz Switched
- 124 Alphanumeric Memories
- Wideband Rx. FM WFM & AM
- Ni-MH Cells & AC charger

ADI AR-147

AM Airband Receive

£199

- 2m 50 Watt Mobile Airband Receive
- Full CTCSS Encode / Decode
- 81 Memories 25 / 12.5kHz Steps
- Keypad microphone & Mounting Kit

KENWOOD TM-V7E

£369

- 2m / 70cm Mobile
- 50W 2m, 35W 70cm
- Cear LCD Readout
- CTCSS & DTMF
- 8 Frequency Steps & 280 Memories
- Includes Microphone & Mounting Bracket

Yupiter MVT-7100EU
100KHz - 1.65GHz

Probably the best vaule foe money, it has stood the test of time and is very sensitive. Offers USB, LSB, CW, AM, FM, WFM, * 1,000 memories * 500 Pass channels * 12 Tuning steps * Fast scan speed * Rechangable batteries, AC charger and telescopic antenna.

£199

ICOM IC-R75 Receiver
100KHz - 60MHz

NEW

£649

FREE AC PSU & DSP Unit

The IC-R75 has received rave reviews in the Amateur Radio Press. It is a very serious short wave receiver with coverage right up to the exciting 6m Ham Band.

features include USB, LSB, CW, AM ,FM * 101 Memories * Super High DynamicRange * Synchronous Am detection * Twin Pass band turning * Digital Signal Processing * Automatic notch Filter * 101 Alphanumeric Memories * RF Gain/Squetch * Clock * Numeric keypad * Altenuator *

ICOM IC-2800H
In Full Colour!

~~£449~~ Phone

- 2m & 70cm Mobile
- Colour TV Screen
- Full CTCSS and 1750Hz Tone
- 50W 2m 35W 70cm

Includes FREE Remote head cable.

ICOM IC-207H

~~£369~~

- 2m / 70cm
- 50W / 35W
- 180 Memories and 7 Tuning Steps
- Detachable Head Unit / Clear Display
- Microphone, Mounting Bracket etc.

KENWOOD TM-G707E

£279

- 2m and 70cm
- 50W and 35W
- Full CTCSS
- 180 Alphanumeric Memories
- Detachable Head with Amber Display

YAESU FT-8100R

Phone

- 2m and 70cm
- 50W and 35W
- Wideband Rx AM & FM 208 Memories
- 7 Tuning Steps DTMF Remote Front panel
- Very compact, supplied with all hardware.

ICOM IC-2100H

~~£269~~ Phone

- 2m Mobile 55 Watts Output
- 50 Alphanumeric Memories
- Switched 12.5kHz and 25kHz Filters
- CTCSS and 1750Hz Tone

Number ONE in Amateur Radio

Waters & Stanton

Order Details on Inside Front Cover

Replacement Batteries

SAVE

		List	Ours
FT-50R			
NBP-40Y	6V 650mAh	£43.00	£27.95
RFNB-42	9.6V 1100mAh	£46.00	£29.95
IC-T8E			
NBP-200	9.6V 680mAh	£40.00	£25.95
NBP-199	6V 700mAh	£30.00	£25.95
TH-D7E			
NBP-39K	9.6V 600mAh	£45.95	£29.95
TH-22			
RPB-32	6V 600 mAh	£32.00	£21.95

RF Metering

Avair AV-600 1.8 - 525MHz 400W

£59.95

VSWR and power meter. Reads RMS and PEP. The ideal all-band VSWR meter. Reads up to 400W (3 ranges)

Watson VSWR / Power Meters.

£59.94

Measure VSWR and RMS or PEP power. Large easy to read meter. 3 ranges: 5W, 20W and 200W.

W-220	1.8 - 200MHz	**£49.95**
W-420	118 - 530MHz	**£49.95**
W-620	1.8 - 525MHz	**£89.95**

144/ 430MHz Dual Band Yagi.

NEW

.142-146,428442MHz
.Single feed
.SO-239, 50 Ohms
.100W max power
.VSWR 1.1 -1.5:1
.Gain 10 dbi 2m
.Gain 13 dbi 70cm
.Boom length 114cm
.5 elements 2m

.9 elements 70cm
.Gamma match
.Weight 2.3kg

£79.95

Extremely well engineered 2m/70cm dual band Yagi. Can be mounted either vertically or horizontally. Each band has separate gamma match but single coaxial feed.

Watson Off-Air Frequency Counters

£59.95

High quality units supplied with antennas, ni-cad packs and AC chargers. They are very sensitive and may be used for near-field checking.

Hunter - 10MHz - 3GHz **£59.95**

FC-130 - 1MHz - 3GHz, switched gates, 16 segments. **£79.95**

Super Hunter - 10Hz to 3GHZ and with signal strength meter. **£149.95**

Antenna Rotators

£49.95

AR-300XL Lightweight

Ideal for VHF and UHF systems of small to medium size. Includes control box, motor and Brackets. Support masts sizes can be up to 50mm

YS-130 Medium Weight VHF

£79.95

Made in Japan, this rotator will support medium sized VHF arrays. The diecast motor housing will fit masts up to 40mm diameter. Includes motor, control box and brackets.

New Create RC5-1 Rotator

NEW £299.95

We are pleased to be able to offer one of the most popular rotators from Japan. The RC5-1 will handle 3-4 element HF beams. It has a torque of 6kg (rotation) and 80kg braking. Uses 7-core cable.

Yaesu Rotators for HF Systems

G-450C	Smaller Tri-band Yagis etc.	**£379.00**
G-650C	Larger Tri-banders etc.	**£499.00**
G-1000C	4 element HF Yagis (cw with 25m cable)	**£559.00**
G-2800SDX	Really large HF Yagis	**£1229.00**
G-550	Elevation Rotator	**£309.00**
G-5500	Az/El Rotator	**£569.00**

We have extensive stocks of tower mounts, bearings and rotator cables. Phone if you need advice. Leaflets available.

Cushcraft HF Yagis - In Stock

High quality DX Yagis. More Cushcraft Yagis are used in the UK than any other brand. Buy from W&S and be assured of long-term spares back-up.

A3S	10-15-20m 3 el. 4.27m boom 8.45m el. 2kW	**£389.95**
A3WS	12m, 17m 3 el. 4.27m boom 7.66m el. 2kW	**£299.95**
A4S	10-15-20m 4 el. 5.48m boom 9.75m el 2kW	**£469.95**
X7	10-15-20m 7 el. 5.49m boom 11.33m el 2kW	**£549.95**
X9	10-15-20m 9 el 8.53m boom 11.12m el. 2kW	**£799.95**
TEN-3	10m 3 el. 2.44m boom 5.49m el 2kW	**£139.95**
XM-510	10m 5 el 5.8m boom 5.6m el 2kW	**£249.95**
XM-515	15m 5 el. 7.3m boom 7.3m el 2kW	**£325.95**
XM-520	20m 5 el 9.75m boom 11m el 2kW	**£529.95**
XM240	40m 2 el 6.7m boom 13.3m el 2kW	**£469.95**

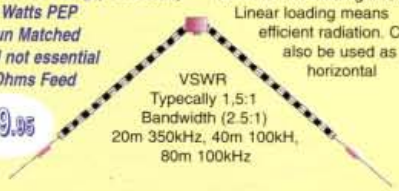
80/40/20m Dipole 50ft Long!

G3OJV 80-Plus-2 **SpaceSaver**

Approx 50ft long (Horizontal)
400 Watts PEP
Balun Matched
ATU not essential
50 Ohms Feed

Ideal for the small garden. Linear loading means efficient radiation. Can also be used as horizontal

£79.95



No soldering, just assemble the elements, check the dimensions and fine tune per instructions. Unlike the G5RV, it self-resonates with low VSWR on all three bands. A unique design that offers LF operation from your back garden.

SGC SG-230 Smartuner 1.8 - 30MHz Wire ATU

~~£329~~ £269

The SGC - 230 is a remote auto ATU that tunes any length of wire in the range 1.8 - 30MHz. Requires a 12V feed of 1 Amp. It is totally weatherproof. Just connect a coax cable back to the transceiver and the SGC-230 will tune instantly RF is applied. The ideal long wire system. Rated at 200Watts.

Telescopic Masts NEW

We are now able to supply a range of telescopic tiltover masts, glavanised to BS729. Heights available from 7.6m to 12m extended. Models for wall mounting or post mounting are included. The post mounted versions tilt-over and are supplied with a socket for mounting in concrete. *Phone or write for information.*

VHF/UHF Antennas

Base Station Fibre Glass

WVA-100	2m/70cm 2/4.5dB 1.09m	£29.95
W-30	2m/70cm 3/6dB 1.15m	£39.95
W-50	2m/70cm 4.5/7.2dB 1.8m	£49.95
W-300	2m/70m 6.5/9dB 3.1m	£59.95
W-2000	6m/2m/70cm 2.5m	£69.95

Mobile Antennas PL-259 bases

W-285	2m 5/8th foldover base	£14.95
W-77LS	2m/70cm 0.39m low profile	£14.95
W-770HB	2m/70cm 1.1m 3/5.5dB	£24.95
W-7900	2m/70cm 5/7.6dB 1.5m	£32.95
W-627	6m/2m/70cm 1.62m	£34.95

Mounts

W-3HM	Hatch / Boot Mount	£14.95
W-3CK	5m low loss cable kit	£18.95
W-ECH	5m RG-58 standard cable	£12.95
WMM-7	Magnetic mount	£10.95
WAM-2	BNC window mount	£12.95

IR- 270 MONO PHONES

~~£34.95~~ £19.95

IR - 270

INFRARED HEADPHONES

Connects to your Receiver without need for long Cable.

Includes: 2 x AA cells, Ac Adaptor Connecting lead with 3.5mm Stereo plug and 1'4 Mono adaptor.

NEW from Cushcraft

R8 8-Band Antenna
40m to 6m 1500 Watts

The R8 is a robust vertical designed to take full US power limits. It has a very broad bandwidth, effectively working to the edges at 2:1 VSWR. Only two traps are used, so reducing the losses. At around 30ft tall, it is designed to give high performance, even on the lowest bands. A true DX-ers antenna in a very small space. Uses very short rigid base radials similar to R-6000.

Cushcraft

5 Band Compact Beam From Cushcraft

NEW MA5B Mini - Beam

£289

10 - 20m Inc WARC bands 1.2KW, 50 Ohm feed, 2 Elements on 10, 15, 20m, Dipole on 12m & 17m, Max element length 5.2m, Boom Length 2.2m, Turning Radius 2.7m, Weight 12Kg

SEC - 1223 13.8V PSU

AMPS - 3.2lbs!

Amazing Value

£99.95

Lighter than an IC - 706 and about the same size! **The SEC-1223** switch mode power supply delivers 23 Amps at 13.8V Thermo-fan cooled, it measures just 57 x 177 x 190mm. It will power all 100W rigs effortlessly and can be changed for 115V AC.

Motorola Talkabout 200

PMR-446 New Low Price

£78

446MHz 500mW Handy
8 Channels
38 CTCSS Tones
3 Kilometres Range
3 x AA Cells Reqd.

Now you can use a 446MHz handheld without a licence. Ideal for a wide range of uses. The package provides everything you need for personal communications. Just add 3 x AA cells and you are on the air!

£149 pair NEW

Every Street in GB on CD!

Search on Postcode or address

Try out: www.travelmanager.co.uk

£47.95
Post £2.00

Every street in Great Britain on one CD. Search by Postcode or address. Zoom in to A-Z style road maps, or zoom out to larger areas. Route planner shows graphic route plus text route instructions. Measure distances, edit symbols. Really amazing database for your laptop.

Order: Travelmanager

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MARCH 2000 CONTENTS

A variable crystal oscillator (VXO) double project... Page 18

Steaming ahead with a Garmin GPSII Plus... Page 34

82 RadioScene

Chris Edmondson VK3CE brings you another amusingly serious 'Aussie Oracle' this month - see page 94.

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STANDARD

Standard C510

A full featured, pocket sized handheld that can be transformed into a powerful mobile too! The C510 and accessories provide a top performance mobile with the convenience of a high specification handheld.

£99 inc VAT

Dual band !

Dual band - 144 & 430MHz
1Watt high power 300mW low power
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
200 memories
Extensive scan functions
DTMF paging function
Cross band operation
Large backlit LCD display
Powered by 3 AA batteries
Size 58mm(w) x 104mm(H) x 27mm(D)
Extensive range of accessories including the CPB510 50Watt mobile booster

£100 inc VAT

CPB510 50 Watt booster
50 Watt booster
Size:150mm(W)x31mm(H)x170mm(D)

C568 Tri band handheld

A high specification handheld with **23 cms** transmit and receive twin frequency display amazing performance and lots lots more...

Tri band !

£239 inc VAT

Tri band - 144MHz, 430MHz & 1200MHz
Up to 5 Watt output (2.5Watts with CNB171 NiCad supplied)
35mW on 1200MHz
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
Receives on 2 frequencies simultaneously
Cross band repeater for RAYNET use
40 memories
Extensive scan functions
BNC antenna connector
Full duplex operation
Large backlit LCD display
Supplied with CNB171 NiCad battery & charger
Size 47mm(w) x 131mm(H) x 34mm(D)
Extensive range of accessories available

C558 Twin band handheld

A twin band VHF/UHF handheld with dual display

£169 inc VAT

Dual band !

Dual band - 144MHz & 430MHz
Up to 5 Watt output (2Watts with CNB151 NiCad supplied)
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
Receives on 2 frequencies simultaneously
Cross band repeater for RAYNET use
40 memories
Extensive scan functions
BNC antenna connector
Full duplex operation
Large backlit LCD display
Supplied with CNB151 NiCad battery, charger & mobile adapter
Size 55mm(w) x 130mm(H) x 31mm(D)
Extensive range of accessories available

STANDARD

C156 VHF Handheld

Without doubt the best selling VHF handheld on the market. The C156 offers good performance, outstanding features & top quality construction for an unbeatable price.

£69 inc VAT

2m band!

144-145.995 MHz transmit
Wideband receiver
5 Watt output (1.8 Watt with CBT156)
CTCSS encode (decoder optional)
1750Hz tone burst
100 memories
BNC antenna connector
Extensive scan functions
DTMF paging function
Large backlit LCD dot matrix display
Size 58mm(w) x 100mm(H) x 26mm(D)
Supplied with CBT156 AA battery case
Extensive range of accessories available

C178 VHF Handheld (low power transmit on UHF)

A remarkable radio at a remarkable price

Transmit 144-145.995MHz & 430-439.995MHz
Up to 5 Watt output (2Watts with CNB171 NiCad supplied)
50mW on 430MHz
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
40 memories
Extensive scan functions
BNC antenna connector
Large backlit LCD display
Supplied with CNB171 NiCad battery & charger
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KEYLINES

Down here in Dorset I - along with many other Radio Amateurs - suffer from the multitude of signals 'broadcast' from television receivers. The many harmonics which originate from television line-timebase circuitry are heard all over the h.f. bands - and unless you have the advantage of digital signal processing (DSP) it's something you have to live with ... especially if it's a neighbour's set!

Despite the fact that interference from TV receivers is annoying - most of us can cope with the problem ... it would take a brave Radio Amateur to inform an owner of an offending set that they're causing 'TVI in reverse'! However, with the growth of satellite-distributed-television (commonly referred to as just 'Satellite TV' - there seems to be particular problems affecting h.f. reception (in particular) associated with this increasingly popular form of broadcast reception, which, of course, along with multiple TV channels can also provide high quality radio broadcasts.

Interference Source

Over the last few years **Tex Swann G1TEX**, *PW*'s Technical Projects Sub Editor, and I have had direct contact with readers who've suffered from interference which was directly attributable to 'satellite' TV systems - particularly the 'dish' antenna and associated 'Low Noise Block' (LNB). However, recently I was in discussion with one of our specialist authors and was quite surprised when he told me he'd never heard of any interference problems associated with 'Satellite' TV systems.

So, after discussing it further, both myself, the author and Tex will be interested to hear from you on the subject. Have you suffered from interference on the h.f. bands that you've associated with a 'Satellite' TV system? If you have ... we'll be interested to know where you thought the problem came from on the system.

Having suffered from truly dreadful QRN from a nearby Satellite TV system in a 'downtown' Hotel in Dayton, USA (when attending the HamVention) I proved it was the source - with the help of the 'Maintenance Man' who happened to be an amateur himself!

Tex and I have debated on what's behind the problems: it might be loose connections, dissimilar metals on 'crimp-fit' wiring providing crude 'noise diodes' effects. There are many possibilities - and we would be very pleased to hear from anyone with any knowledge or experience. And if you're a Radio Amateur who is involved with installing such equipment - we're waiting for the telephone call, E-mail or letter!

Avalanche Of Replies

As I write this edition of 'Keylines' I'm perched on a considerable pile of letters from readers. They've all replied to the personal 'Can You Help Me' request I published in the February issue of *PW*.

What a marvellous bunch of people you are - there was an incredible response - including that from a reader in the Isle of Man who even went to the trouble of finding my telephone number via 'Directory Enquiries' (thank you). I've also received much help with the transistor enquiries and possible substitutes.

I could fill this page with 'thank yous' for individuals - but I know you'll understand when I issue a 'corporate' acknowledgement instead. I'm extremely fortunate to have friends like you - but of course, as you'd do the same for any Amateur Radio friend ... surely it's the hobby itself which benefits and reflects your kind help?

Letters To The Editorial Team

Now that we've got a 'centralised' post room service here in the Broadstone offices, we're occasionally having difficulty with letters/packages which have had important information included on the packaging or envelopes. It's got worse since we've been handling the *PW* CD offer, because all post is opened and sorted and then sent up to the Editorial Departments - minus the envelopes/packaging.

Occasionally, when the Post Room spots important information on exterior packaging/envelopes - they'll send it upstairs with the letter/package contents - but this cannot be relied on. So, as our incoming mail can be overwhelming at times ... I'm asking for your help!

Please, when writing to *PW*, make sure you indicate clearly (**on the letter itself**) whether it's 'Letter for publication', for 'Editor's Attention' or whatever. Small packages should - wherever possible - have their contents clearly identified ... just in case they do become (unintentionally) separated. It makes our job much easier and can help us to help you that much quicker.

Radiocommunications Agency

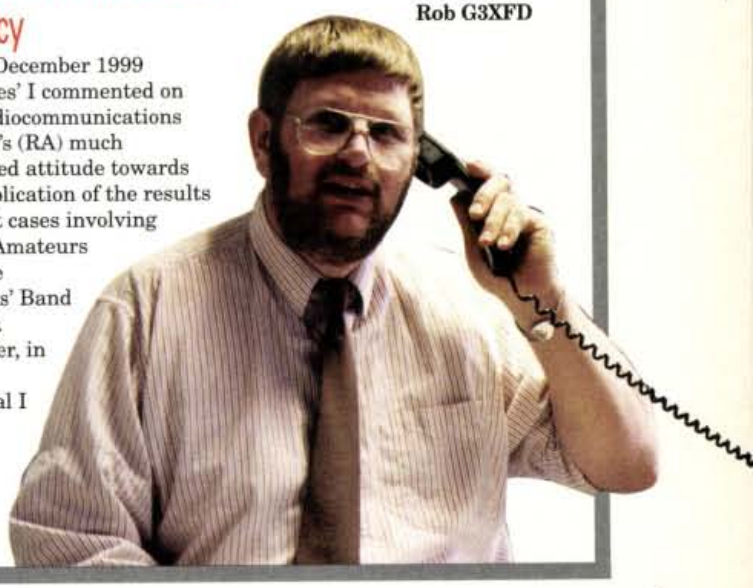
In the December 1999 'Keylines' I commented on the Radiocommunications Agency's (RA) much improved attitude towards the publication of the results of court cases involving Radio Amateurs and the Citizens' Band service. However, in the editorial I also suggested that the RA 'could do better' when it came to the time it took to issue press notices regarding the proceedings/results of the court actions. My comments drew attention to the fact that it had seemed (from the dates we were provided with) it had taken a disproportionately long time to issue the press statements dealing with the matter in question.

I've now received a letter from **Barry Maxwell**, Director of The RA, informing me that the press release involved, dated 17th of June, would have been sent to the *PW* office. However, had we received the RA's press release in June, rather than September ... my 'could do better' comment would not have been written.

So, in reply to Barry Maxwell's own words where he writes that he's sure that my "usual spirit of fair mindedness" will be reflected in my next editorial" - I must in this instance apologise to the RA in appearing to be so critical, particularly as the problem was seemingly caused by simple misdirection of post which was beyond their control. **My apologies to you Barry!**

We never received that important DTI/RA Press Release on the due date in June - and even though I contacted the RA ... I was not made aware it had gone missing. But you can be sure that in future, both *PW* and the RA staff will be very careful to ensure we're both kept fully informed and that there'll be no room for confusion or mistakes from either side.

Rob G3XFD



COMPILED BY ROB MANNION G3XFD

The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by Practical Wireless. All other letters will receive a £5 voucher.

Help From Friends

Dear Sir

I am only 14 years old and am taking the full RAE in May of next year and hope to be an M0 by 2001. I first found out about Amateur Radio in the 1998 JOTA run by the Scout Association. After that I went to the local CB and Radio Shop. (Yes a CB shop!). The guy in there was very helpful and put me in touch with **Tim M0ACV**, the local RAE tutor.

I was overjoyed to find out that my Dad had managed to borrow a receiver for me. This has brought many hours of fun and now I have over 1000 callsigns from over 53 countries including the United Nations twice in the s.w.l. Log Book. This may not seem bad for four months, but I'm only using a randomly cut, home-made dipole that is precariously hanging above my head on the shack wall. This dipole is run through a home-brew a.t.u. that I was given.

Anyway, back to the story. I got more and more into the hobby and began to seek for information on the Internet. This lead me to find the friendliest people I had ever spoken to and, although it may have been said before, **it's 100% true**. I even got offered gear which I got at a cheap price just for being young!

Every time I asked for some information about 'skeds', data modes such as PSK31, RTTY, etc., I got so many replies that I started up my own DX E-mail list. This list now contains many people from all over the world who have helped me in my quest to listen to some exotic modes and get over a 1000 people in the Log Book.

Out of these people every single one of them has wished me luck with the RAE and has expressed how nice it is to see such young people get into radio. My parents were amazed when I told them that somebody in Japan had given me details of a contest and someone from Tasmania gave me some hints on *Windows 95* software to use. My parents are now, from being half-hearted and not very keen, endorsing the hobby all the way and think that of all the hobbies available, I have picked the best.

Thank you to everybody for a wonderful hobby and, although unlicensed, I'm really enjoying it. Also thank you to **Murray ZL1BPU** and **Nino IZ8BLY** for making the digital modes more popular and enabling people like me to use a PC sound card to receive such modes. The more I listen to data, etc., the more I have the need to get past the Morse test and work the world on Data and maybe even a bit of the old c.w.

But, of course, there are those who have to spoil it for us. For example, on the newsgroup uk.radio.amateur - a Packet BBS sysop - published a list of all the mail that had been deleted by hackers. I have to ask you all how low can some people get? This is a hobby for all to enjoy and doesn't need people like that disrupting an otherwise fantastic hobby.

A note on Morse: I am keen on h.f. data modes so I will take the 12wpm Morse if I have to, as there needs to be a way of distinguishing the amateurs that want to operate h.f. and those who want the privileges given. If someone really wants to operate h.f. don't you think they should be bothered to learn Morse or at least try to, rather than just sitting around complaining about it?

I now know nearly half of the A-Z in Morse quite well and a further quarter reasonably well. Morse is great so get learning it - we can't let this mode die. Remember that Morse was there in the very roots of radio and always will be.

Iain Kelly M1??? (Nearly!)
County Durham

Editor's comment: Reading this letter, everyone on the *PW* team felt encouraged themselves! Well done Iain and also to the many friends he's made at home and abroad - our hobby is truly 'striding into the future' with confidence. We'll keep in touch with him and as soon as he's 'on the air' *PW* readers will be informed of his new callsign.

Can You Help Me?

Dear Sir

Recently I spoke to the Editor at great length about our much loved HMV Radiogram (Model 1644). It was bought new in the 1960s and visually is immaculate. The Editor was kind enough to listen to my tale of woe for ages and also gave me a couple of likely sources where I could seek help.

But the main purpose of this note is to thank you for your courtesy which I do most sincerely. I have been in touch with some names you suggested but perhaps you would allow me also to take advantage of your 'Letters' page to ask for further help.

Previous to contacting you I had been in touch with many possible sources without success, including numerous libraries and the Radio Preservation Society in the Isle of Wight.

Full details of the machine are as follows: HMV Stereophonic a.m./f.m. auto Radiogram model 1644, circa 1960, full drawings available. Machine was working well but one day the transformer burnt out (a lot of smoke and an awful smell).

Is there someone within a reasonable distance who is prepared to have a go at rebuilding the chassis? I can get this removed and would gladly transport and obviously pay any reasonable costs. Any help would be appreciated. Abersychan is about 12 miles north of Newport, Gwent in South Wales. Many thanks once again.

John Taylor
'Graigwen',
Snatchwood Rd,
Abersychan,
Gwent NP4 7BU

Editor's comment: John's letter doesn't really do justice to the efforts he's made to try and track down somewhere to get his radiogram repaired. So, in an effort to assist further I'm hoping that a reader can help him. Replacing a burnt out mains transformer (and finding out why it had been damaged in the first place) might seem a minor matter to many of us, but I think his search clearly illustrates just how difficult it is to get older equipment repaired or serviced. However, as my comments (under the heading 'Amateur Radio Help Alive & Well') in the February 'Keylines' says - "the helping hand aspect of the hobby is alive and well". Now it's over to you readers! (Please reply to John at the address shown).

Generally Bitter?

Dear Sir

What is it about Radio Amateurs that makes them generally so bitter towards each other? I say this because almost every time I pick up one of our magazines somewhere inside it there will be somebody who is hell bent on knocking another amateur's qualifications as not being as good as their own!

Then we get things like "the half-licence for the half-qualified and half-interested". We get, with amazing regularity, reference to the "black box operator" inferring that he/she is not fit to hold a licence and so it goes on and on and seemingly forever!

There are occasions when I pick up magazines applicable to other hobbies (**and allow me to say Amateur Radio is only a hobby**) and it is a pleasure to read them. There is no 'bitchiness', no knocking of the less qualified and most important, no "better than thou attitude". All of these things seem to be creeping into our wonderful hobby! Why must we belittle ourselves in the eyes of the casual reader and appear to be little more than cretins? Because this, in my opinion, is the image we are projecting!

I cannot believe that the hospital surgeon would belittle the hospital doctor, nor he in his turn doing the same to any of the nursing staff, particularly in a magazine that is available to the general public! This being so, why on earth is it not possible for amateurs to adopt the same attitude and allow all who have passed the RAE to enjoy the hobby? We should welcome all newcomers with open arms, particularly the Novices (who have taken a bit of a beating in the past) because they are our future!!

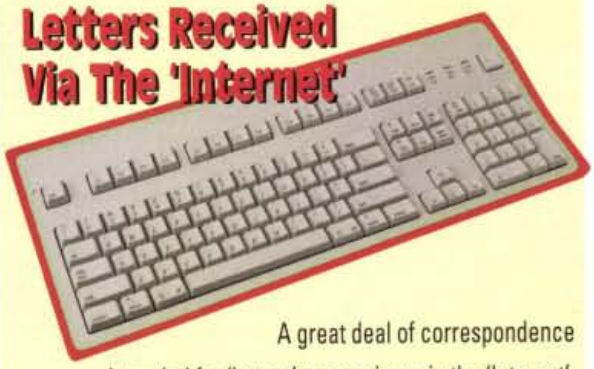
I have a Class One heavy goods vehicle licence but I don't try and belittle the man or woman who has not got such a licence. Neither do I call him/her half-qualified or any other sort of derogatory names. What we must all remember is, in all walks of life there are varying degrees of qualifications.

Perhaps it all boils down to whether you like the sound of your own voice, particularly when bragging about yourself, maybe it just makes you feel good and important. I must admit I cannot understand why some people have to do these sort of things, perhaps a little more common sense and acceptance of the inevitable change would not come amiss. Live and let live should be our policy, we all know our qualifications and are also aware of our limitations, we should not feel the need or desire to shout about it. Long live Amateur Radio, let us clean up our act and all feel better for it!

Keith Wells M1ADQ
Derby

Editor's comment: I agree wholeheartedly with what Keith says. We must all 'pull together' and remember that our hobby is a hobby. I meet very many people connected with Amateur Radio and really enjoy meeting most of those that come my way ... but occasionally I'm truly shocked and surprised by the opinions expressed. One reader - who probably is a dedicated Radio Amateur in his own way - truly 'singed my ears' during several shows. What was his complaint you might ask? - Simply put, it was his outright objection to the involvement of Women in Amateur Radio and particularly in *PW*. Even Donna G7TZB was in line of his 'verbal fire' when she worked for the magazine! It's this sort of attitude, and that shown by the infamous BBC2 'Arena' programme featuring the organised abuse of 144MHz repeaters in the West Midlands that causes harm to the hobby's 'public image'. However, it's easy to overcome the effect by ensuring everyone knows that such attitudes and opinions are held only by a very few!

Letters Received Via The 'Internet'



A great deal of correspondence intended for 'letters' now arrives via the 'Internet'. And although there's no problem in general with E-Mail, 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 don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! All letters intended for publication on this page must be clearly marked 'For Publication' (on the letter itself). **Editor**

Dorset Raynet - A Tribute From The Red Cross

Dear Sir

I wonder if you would consider including the piece below in the 'Letters' section of the *Practical Wireless* magazine:

For several years now the **Dorset County branch** of **Raynet** have provided the **British Red Cross** in Dorset with essential Emergency Radio Communications. As is widely recognised, the Red Cross in conjunction with a number of other voluntary agencies have a responsibility to provide support to the statutory agencies at time of emergency. The term 'emergency' covers a wide spectrum ranging from war, natural disasters, major accidents to public events. In Dorset we were recently requested to support Dorset Ambulance with two major deployments: the Eclipse and the millennium celebrations.

Through your 'Letters' pages may I, on behalf of the British Red Cross, express our gratitude to all involved in the Radio Amateurs Emergency Network for their truly professional approach and their invaluable voluntary work which they undertake in supporting ourselves and many other organisations.

To illustrate one such example, I refer to New Year's Eve. A number of British Red Cross Volunteers were deployed in Bournemouth, several groups patrolled part of the town on foot in order to provide mobile First Aid resources in support of and in conjunction with the Ambulance Service. Each group had in support a Raynet member who was in constant radio contact with a Central Control Position. Apart from providing the essential radio communication, the small groups greatly valued the reassurance and companionship that their individual operator offered especially during a somewhat difficult and potentially hazardous operation.

Our special thanks go to the Dorset Raynet County Controller, **Chris Hampson G8RXA**, his wife **Gill G0JIL** and his deputy, **Keith White G7HQR**. Not forgetting those in the midst of it all - **G1VHG**, **G4FDS**, **G0WTG**, **M0AUY** and **G4WCK**. A very special vote of thanks to the back-up provided by **Rob Burrows G6DUN** and **Rob**, the proprietor of the **Short Wave Shop** in

Christchurch, loaded his vehicle with spare equipment and positioned himself on site should it have been required.

We have all been truly impressed by the excellent and very professional approach adopted by Radio Amateurs throughout the country. Certainly in so far as Dorset is concerned, we greatly value their enthusiastic and invaluable support and co-operation.

Peter Hill
Emergency Planning Officer
Dorset County Branch
British Red Cross

Editor's comment: Take a bow Dorset Raynet!

Callsign Listing CD - Thank you PW

Dear Sir

I know you must have had thousands of letters and E-mails from very satisfied readers regarding the 'FREE' *PW* Callsign Listings CD. I would just like to add my name to the list.

I have been collecting my tokens and, when the final one arrived along with ordering instructions, I put everything in an envelope and dropped it in the post box, fully expecting to receive my CD sometime in the new millennium. Imagine my surprise when the postman delivered my package **just FOUR days later!**

I have tried (and used) two or three different callsign programs over the years but I must congratulate you on finding a 'Search Engine' such as this one. Not only can it search in several different ways but it does so extremely quickly, well done. By the way, I did a search on 'NR5' only (that's the first half of my post code) and was astonished at what I found.

Once again *PW* team, a very, very big thank you to all who were involved with the production of this CD. All we need now is another superb *PW* Wall Chart and we'll be well away!

Take care and regards to everyone at the Broadstone offices.

Peter Hunter G0GSZ
Norwich

Editor's comment: Our pleasure Peter! Thanks also to everyone who has written in to say 'Thank you'. Tex G1TEX - who spent many months compiling everything for the CD, along with everyone else involved, is delighted with the feedback from readers.

Potato ... & Halfpenny Power

Dear Sir

Your comments in 'Letters' (January 2000) about using a potato as a source of electricity reminded me of an event in the 1950s at the Annual Dinner of the **Barnsley Amateur Radio Club**.

Jack Ward G4JJ brought along an audio oscillator made from one of those new (then!) fangled transistor 'thingies'. His power source was a single cell made from a halfpenny (bronze) and a milk-bottle top (aluminium), separated by a piece of paper moistened with his saliva, the whole lot plus the connecting wires, being held together by a plastic clothes peg. The tone emitted from the headphones could be heard three or four metres away (several feet in those days!).

It may not have been wireless, but it was certainly practical!

Yours nostalgically

Walter Farrar G3ESP
Pontefract

A Tribute To David Birch GM1EHK

Dear Sir

I am writing to you to inform you of the death of a fellow amateur, **David Birch GM1EHK**. David was a very active v.h.f. and u.h.f. operator on all modes and would be known by many of your readers who are also v.h.f./u.h.f. enthusiasts.

David was unfortunate in that he lost one of his legs due to an intractable infection. This did not deter him in any manner or fashion from leading a normal life.

Being a person of great determination and courage he went back into education to learn IT skills. He also converted the loft in his home into a radio shack and would give up his time to visit hospitals in Central Scotland to give moral support to other people who had lost limbs.

Every time I met David he would always greet me with a smile and a warm welcome, never complaining about anything. David was 48 years old, dearly loved husband of Maureen and loving father of Michelle. Amateur Radio won't be the same in this part of Scotland due to this tragic loss.

Matthew McLauchlan MM1DPC
Fife

Editor's comment: Thank you Matthew - we're pleased to publish your tribute to David GM1EHK. Amateur Radio is well endowed with such people and I'm proud to have shared the hobby with him and have also written to his family expressing our sympathy and admiration.

Ben Nock G4BXD's Marconi 'Atalanta'

Dear Sir

The name of the Marconi Atalanta receiver highlighted by Ben Nock G4BXD (in 'Valve and Vintage', February 2000) has often been confused, both with Atlanta the capital of Georgia in the USA and the KW transmitter. In Greek mythology, Atalanta was a fleet of foot huntress who declared that a prospective suitor must compete with her in a foot race; if he loses he must die.

A chilling thought perhaps but Marconi's choice of name for the receiver must surely be based upon the fleet of foot hunting aspect being compared to searching for signals. And as such it would seem to create a desirable image in the eyes of a future customer. It sounds good too!

Jim Cookson G4XWD
Norfolk

'Tingling' Memories

Dear Sir

The vintage feature ('Valve & Vintage', Phil Cadman G4JCP, page 60) in the December 1999 issue bought back memories of the first mains driven TRF receiver I built as a teenager in the 1950s.

It used a 6SN7 metal valve with one half used as an RC coupled audio amplifier into headphones and the other used as a TRF detector with reaction.

There was a bout 150V of h.t. using a metal rectifier and I got many 'tingles' off the 'phones if I touched the bare terminals trying to make them comfortable. In the best traditions of home-brew radio, it wasn't very tidy and used a solid dielectric 300pF reaction condenser and a Repanco tuning coil which was switched to give l.w. and m.w. coverage.

The set worked well and got Radio Luxembourg very nicely in the evenings. The antenna wire was strung from the house to a tree in the front garden and after a winter gale it dropped across the path and nearly garrotted the postman who had to be pacified next morning by mother with a cup of tea when he complained!

Tony Hopwood
Worcestershire

A LETTER PUBLISHED IN PW WINS YOU A VOUCHER TO SPEND ON ANY PW SERVICE

COMPETITION

WIN An Alinco DX-70TH!

Just imagine - you could enjoy working 'portable' or mobile in the same way Rob Mannion G3XFD does. "I wouldn't be without my two DX-70s" he says!

Yes... you could win a brand new, fully featured **Alinco DX-70TH h.f. and 50MHz transceiver** (kindly donated by **Nevada**), currently worth **£599**, in our simple competition.

The time has come and now you've got a chance of winning your very own **Alinco DX-70TH transceiver** - kindly donated by **Nevada**, in the joint *PW* & Nevada competition.

All you have to do is answer the following six simple questions and then complete a 'tie-breaker' sentence. That's all there is to it, the competition is free-to-enter and all you have to do is attach the two 'corner flashes' from the January & February issues of the magazine (as well as the corner flash from this issue) to the final entry form and off you go! (See below for competition rules). Good luck everyone!

Order Form to: Alinco DX-70TH Competition, PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

Answer the following questions on the Alinco DX-70TH.
Please circle the correct answer

1. Is the DX-70TH fitted with 'narrow' filters for c.w. and s.s.b. reception as standard?	Yes No
2. Is the Alinco DX-70TH capable of operating on all bands from 1.8 to 28MHz?	Yes No
3. Does the Alinco DX-70TH operate on the 50MHz Amateur Radio band?	Yes No
4. Is the maximum transmitter output of the DX-70TH advertised as 50 or 100W?	50W 100W
5. Is the DX-70TH equipped with a general coverage receiver?	Yes No
6. Is the DX-70TH main front panel 'demountable' to allow for remote control operation with an extension lead?	Yes No

Complete the following 'tie breaker' sentence (Maximum 30 words including introduction):

"The Alinco DX-70TH transceiver is so versatile because...

.....

.....

.....

.....

Name & Callsign: .....

Address: .....

.....

.....

Postcode: .....

Telephone No: .....

Rules: All entries must be sent in on the form printed on this page (photocopies of this form ONLY accepted if corner flash from this issue attached) with corner flashes from the January, February and March issues also attached. All entries must be received at the *PW* offices in Broadstone by Friday 31st March 2000. Editor's decision is final and no correspondence will be entered into. The winner will be informed in writing and the prize presentation arranged by the Editor and Mike Devereux G3SED of Nevada.

Alinco DX-70TH 03 2000

COMPILED BY JOANNA WILLIAMS

Headline News

Three American Amateur Classes - One Code Speed

News has arrived from the United States of America that the Federal Communications Committee (FCC) has announced that from April 15th 2000 there will be three classes of Amateur Radio Licences issued in the US - and all will share the requirement for a single Morse Code capability of five words per minute. The three classes of Amateur Radio licence will be as follows: Technician, General and Amateur Extra.
(The following condensed report is extracted from the FCC report. Editor).

The long awaited full FCC report was issued on December 30th 1999 and the spokesman for the FCC said "We believe that an individual's ability to demonstrate increased Morse code proficiency is not necessarily indicative of that individual's ability to contribute to the advancement of the radio art".

"Beside drastically streamlining the (*American*) Amateur Radio Licensing process", the FCC spokesman said its actions would "Eliminate unnecessary requirements that may discourage or limit individuals from becoming trained operators, technicians, and electronic experts".

Although no new (*American*) Novice and Advanced Licences will be issued after the effective date of the Report & Order, the FCC does not plan to automatically up-grade any existing licence privileges. The (*American Radio Relay League*) ARRL had proposed a one-time across-the-board up-grading of current Novice and Technician Plus Licences to General Class, but the FCC declined to adopt the idea. This means that current licensees will retain their current operating privileges, including access to various modes and sub-bands, and will be able to renew their licences indefinitely.

In addition to reducing the number of licence classes from six to three and eliminating the 20 and 13 words per minute code tests, the FCC will also reduce the number of written examination elements from five to three.

Under the new (*American*) licensing scheme there will be four examination elements. Element 1 will be the five words per minute Morse Code examination, Element 2 will be a 35-question written test to obtain a Technician Licence, Element 3 will be a 35-question written test to obtain a General Licence, and Element 4 will be a 50-question written test for the Amateur Extra Licence.

A copy of the entire Report and Order (FCC 99-412) is available at: **http://www.arrl.org/announce/regulatory/wt98-143ro.pdf** or at **http://www.fcc.gov/Daily_Releases/Daily_Business/1999/db991230/fcc99412. txt**

Note: For those readers who don't have access to the Internet and would like to see the full report (as received here at the *PW* offices) from the ARRL, free photocopies are available in exchange for a stamped (26p) addressed envelope. Please mark your s.a.e. **'American Licence Changes'**.

A MAG Mistake

You may remember that in last month's *Practical Wireless*, in the news section, we reported on a Trek to support **MAG - Mines Advisory Group** which **Gordon Smith G7UHP** is taking part in. Unfortunately, *PW* failed to state that the trek will be taking place in June/July 2000 - that's this year!

So, if you would like to know more about the trek or if you can offer any help to Gordon Smith G7UHP in his search for financial and technical help, then please contact him at **256 Jockey Road, Sutton Coldfield, West Midlands B73 5XP**.

Southern Sound Goes Mobile

Practical Wireless received some interesting news from **Icom (UK) Ltd** this month about **Southern FM** broadcast radio station's new mobile station set-up. Icom tell us that Southern FM have recently had its Jeep Cherokee radio car equipped with Icom radio communications equipment - namely an IC-F1010 mobile radio transceiver - which will help them to perform their outside broadcasts.

The equipment was engineered by Brighton-based company **MRM Hire** who, Icom tell us, originally received "a very specific brief from Southern FM who wanted their new vehicle equipped with communication equipment allowing it to broadcast on the road". According to the press release from Icom, "one of the prerequisites of the brief was that non-technical staff could operate the equipment from inside".

According to Icom, MRM engineered various components into a compact operating unit which sits in the back of Southern FM car (as you can see from the photograph). This system is made up of a number of elements including a **Sony 'off air' receiver**, an **Icom IC-F1010 transceiver** for car-to-studio communication as well as the all important batteries and chargers.

The IC-F1010, Icom tell us, enables the operator to talk back and listen to the studio whilst on air and, according to **Mike Rump**, Chief Engineer of MRM Hire, was chosen for its "flexibility, wide range of functions and ease of use". The equipment supplied to Southern FM for their outside broadcasts can be modified to suit a wide range of needs and can be incorporated into both large and small stations.

For more information on this story or to find out about any other Icom equipment, please contact them on **Tel: (01227) 741741, FAX: (01227) 741742, Sea Street, Herne Bay, Kent CT6 8LD**.

Standard Value For Money

In next month's *Practical Wireless* we will be reviewing two **Standard** hand-helds from **Entel UK Ltd** - the **C-510 dual-band f.m. hand-held transceiver** and the **C-156 v.h.f. f.m. transceiver with wide-band receive**.

The C-510 is a full-featured hand-held, according to Standard's own literature, which can also be "transformed into a

New Premises For Vann Draper

Tim Coates of **Vann Draper**, the test and measurement specialists tells us they have moved to a new and larger premises at Derby. **Stenson House** is a Grade II listed building which was built in the early 1800s, Tim tells *PW*. It is set in three acres of grounds just south of Derby.

This new site for Vann Draper has approximately 1500

high power mobile too"! (Our reviewer will be looking at this aspect in the review next month).

Some of the features of the C-510 include: transmit on 144-146MHz; receive on 110-190MHz, 340-490MHz and 750-995MHz a.m. or f.m.; set for use on 12.5kHz spacing on the v.h.f. band; 1W power output (800mW with NiCad batteries); 1750Hz tone burst; CTCSS encode and decode with tone search; DTMF with pager function; 200 memory channels; various scan functions; powered by three AA batteries and SMA antenna connector - all this for only **£99 including VAT!** (Mobile adapter is extra).

The C-156 is a little larger in size than the C-510 but carries the following features: up to 5W output (1.8W with CBT156); wide band receive (110-174MHz); three output power levels; auto repeater; clear back lit dot matrix display; 1750Hz tone burst; CTCSS encode; 100 memory channels; supplied with CBT156 four AA battery case; built-in DTMF encoder/decoder; alpha-numeric paging function and a large range of accessories. The C-156 is only 100(h) × 58(w) × 26(d)mm and weighs only 210g (without NiCads). All this for a mere **£69 including VAT!**

For more details on these or any other Standard products please see their advert on page 4 and 5 of this issue or contact **Entel UK Ltd direct on Tel: 0181-236 0032, FAX: 0181-236 0082, 4th Floor Allied Dunbar House, Elstree Way, Borehamwood, Herts WD6 1JH or E-mail: sales@standard-comms.co.uk**

Swimmingly Successful Special Event!

Readers might remember that the *Practical Wireless* news pages featured news of a 36-hour Special Event which took place to raise funds for the swimming pool at **Raunds Windmill Primary** in the February 1999 *PW*. Well, **Richard Evans G0VCW** has been in touch with *Practical Wireless* to tell us how they got on.

On **Friday 29th January 1999**, Richard, with the help of **John M0ASM** and **Tony G0EKD,** erected the antennas and set the station up - the h.f. antenna was a doublet, with each leg being 37m (120ft). Two collinears were also erected - one a dual-band and one a tri-band.

The station consisted of two Packet demonstrations, with one of them being linked to the h.f. radio in order to monitor the DX cluster. There was also speech on 144 and 430MHz, Richard told *PW*. As well as the activity taking place with regards to the Special Event, in the school hall they set up an exhibition of Amateur Radio and communications which included a Morse oscillator where the public could send their name in Morse code and receive a certificate.

As well as all of this, they also had a short wave receiver set up for people to play with. An array of magazines, maps and general literature about the hobby was also spread around the room on walls and tables.

At 2200 Friday evening everything was ready to go and the first CQ was called at 0400 Saturday morning under the station callsign of **GB0RWS** and the first QSO was made at 0430 with **RA3DJQ** on 7MHz. Not many contacts were made on this band, Richard tells *PW*, so the station moved to 3.5MHz where the first DX was worked.

At around 0930 the station changed to 14MHz and the first CQ on this band was made by **Frank VK7BC** from Tasmania. During the first day the station worked on 3.5, 7, 14, 18 and 21MHz.

The station continued to operate throughout the night on 3.5 and 1.8MHz c.w. only due to the fact that **Gill** (Richard's wife) had now had enough and was hitting the Z-bed next to the radios. No DX was worked on these bands, just local European stations - conditions seemed to be very poor as the QSO rate dropped to around two or three per hour, Richard tells *PW*.

The station continued operating throughout Sunday mainly on 14 and 18MHz with the farthest QSO being into New York (see photo - **Nick G4OOQ** turns up Sunday morning 0400 to give Richard G0VCW a helping hand). A total of 150 QSOs were made throughout the Special Event and a total of 36 countries were worked. Over the two days there was a great deal of public interest, participation and enjoyment especially from many of the children who attend the school.

The Special Event was a great success and raised lots of interest as well as **£1308.17** for the swimming pool fund. The school were very grateful and *PW* has been told that the swimming pool is up and running with the children enjoying themselves immensely.

Lighthouse/Lightship Weekend 2000

Readers may remember that last year the **International Lighthouse/Lightship Weekend** took place in August 1999. This year the period of the event is from **0001UTC on Saturday 19 August until 2359UTC on Sunday 20th August 2000.**

Mike Dalrymple GM4SUC has been in touch with *PW* to tell us all about this year's event. It is "NOT a contest", he says, "each station decides how they will operate their station regards modes and bands. Participants are not committed to being on the air during the entire period - only as much as they can. There are no restrictions on antennas or power".

Mike goes on to say that the main thing is for operators to enjoy themselves. He does ask, however, that "stations take some time to work the slow operator, the newly licensed and QRP stations". Activity doesn't have to take place inside the lighthouse tower itself - a field-day type set-up at the lighthouse or other building next to the lighthouse is OK - **permission must be obtained from any interested party**.

To assist other stations, Mike says that they would like participating stations to add 'LIGHT', 'LGT', 'LIGHTHOUSE' or 'LIGHTSHIP' after their callsign. UK stations normally obtain a GB callsign with the letter 'L' in the suffix to assist other stations identifying them as participating in the International Lighthouse/Lightship Weekend.

For more information on this event, please contact **Mike Dalrymple GM4SUC (QTHR)** via E-mail: **gm4suc@compuserve.com**

square feet of offices in the main building with a further 2000 square feet of factory/warehouse located within the grounds to the rear, Tim says. Visitors car parking is immediately adjacent to the main building and both the offices and factory unit have separate road access.

"Telephone and FAX numbers for Vann Draper have also changed" Tim tells us and are as follows: **Vann Draper Electronics Ltd, Stenson House, Stenson, Derby DE73 1HL.**

Tel: (01283) 704706, FAX: (01283) 704707. E-mail: sales@vanndraper.co.uk Web site: www.vanndraper.co.uk

Important Information

The following important piece of information was announced in mid-January regarding. **Subscription Services Ltd (SSL).** They are now known as **Post Office Customer Management Ltd (POCM).** However, cheques, etc., made out to SSL will still be accepted for some time.

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RADIO BASICS

This month Rob Mannion G3XFD discusses various simple methods of checking the values of fixed and variable capacitors.

Many modern fixed capacitors are small - and very often they can be extremely difficult to identify, especially when it comes to the actual value. Variable capacitors - particularly the lower value types which are often used in simple short wave receiver projects can also prove difficult to identify and it's also rare to find them marked with any values at all.

So, there you are - a lovely 'bargain box' of mixed types of fixed capacitors in front of you - and many aren't marked clearly or (as is often the case nowadays!) the markings are truly minuscule.

What do you do then? Well, in answering I must insist that you don't throw them away! No true radio enthusiast does that (take a look at the average workshop to see the truth in my statement!).

Joking apart, there's much you can do to identify small value capacitors and for that matter - variable capacitors which, as I've said already - are very rarely marked with their values. So, let's look at some techniques which can help us.

Simple Ideas

As the 'Radio Basics' series is - as the title suggests - aimed at encouraging less experienced readers to 'have a go', I'm going to concentrate on the less complicated ways of estimating the values of unknown capacitors, or checking known values against a 'standard' reference capacitor's value.

Later on this year, *PW* will be featuring a clever little 'capacitor checker' project - so I'm not intending to fully describe a particular project this month - instead I'm offering some ideas which you can follow up and try for yourself.

Additionally, for the really keen constructor, there are many extremely useful and versatile Capacitor/Resistor 'bridge' designs to be found. These offer accurate results and can be very simple indeed - and one of these well know designs was my favourite for many years.

The circuit I have in mind was first discovered (in my case) in what's become a rather difficult-to-find booklet. Published by the RSGB (the first edition appeared sometime in the mid 1960s) the *Amateur Radio Circuits* book was a loose leaf, spirally (using plastic) bound publication. Printed on heavy gauge paper the book was designed to be used laid 'flat out' on a work bench - employing what I called the 'minimum text, maximum circuit', approach. It was really 'packed' with ideas.

Amateur Radio Circuits was a real 'winner' as far as I was concerned - and many projects were built with its help. And if you ever discover one at an Amateur Radio 'car boot sale' - jump on it because there's a clever little bridge circuit included which, even now, can be very useful ... especially if you've got any old OC44 and OC45 transistors lying around!

STOP PRESS

Earpieces for the MK484 (ZN414) radio projects are now available for 50p each! Readers who are interested in building the simple MK484 radio project featured in the February issue of 'Radio Basics' can now obtain suitable surplus telephone earpiece inserts from John Birkett in Lincoln. These sensitive (and robust, mounted in aluminium casings) earpiece units have proved to be ideal for the purpose and a test batch sent to G3XFD for evaluation proved to be excellent. The earpiece inserts costs 50p each plus postage and packing. For further details please contact **John Birkett at 25 The Strait, Lincoln LN2 1JF. Tel: (01522) 520767.**

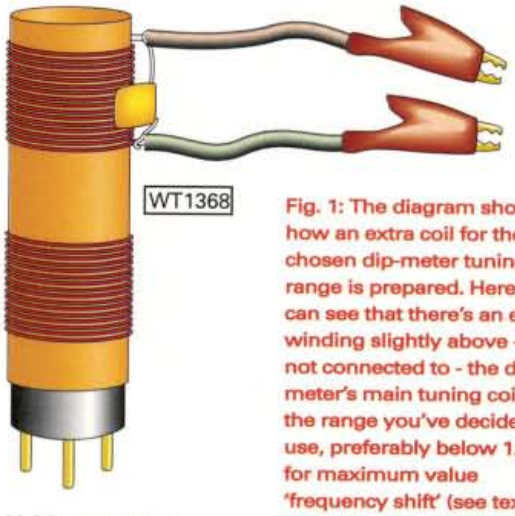


Fig. 1: The diagram shows how an extra coil for the chosen dip-meter tuning range is prepared. Here you can see that there's an extra winding slightly above - but not connected to - the dip-meter's main tuning coil for the range you've decided to use, preferably below 1.5MHz for maximum value 'frequency shift' (see text). Note: the plug pin detail for the coil-base will depend on the dip-meter in use - for the 'Tinny Dipper' project please refer to pages 20 to 23 in th February 1999 issue of *PW*.

For those of you who have built the 'Tinny Dipper' hand-held dip-meter project - there's a several very simple options when it comes to capacitor checking. So let's take a look at them:

Suggestion 1: Using on the low frequency ranges (I suggest below 1.5MHz) you can wind a test coil and arrange for it to provide the maximum 'dip' on your 'Tinny Dipper' at the highest frequency end of the range you've chosen, when you couple it to the dip-meter's coil

Obviously, the highest frequency 'dip' will be achieved by the use of the test coil (coupled to the dip meter in the usual way) in conjunction with a suitable capacitor. This is connected across the coil in the usual way of a parallel tuned circuit (one lead of the coil attached to one end of the capacitor and the other end of the coil attached to the opposite end of the capacitor.

The capacitor should be chosen with a value so that the maximum 'dip' occurs as close to the highest tuning point of the chosen coil range as possible. This is necessary because any other capacitor (in this case the 'unknown' or 'test' capacitor which is connected across the first, or 'reference', capacitor - will lower the frequency read-out on the 'Tinny Dipper' tuning scale).

The 'reference' capacitor can be a known value of around 5pf. Once the frequency change (downwards in frequency) has been noted, you can then provide yourself with a 'plot' of frequency changes and where the dip meter's indication of resonant frequency (the 'dip') takes place. You can then make note of these on a separate chart so that when using the 'dipper' to check capacitors - you'll immediately know - by comparing the readings gained from checking the test capacitors - with those obtained from testing the 'unknown' capacitors.

Separate Coil & Dial

Now I'm going to suggest a little more work - but it'll be worthwhile and helpful in the long run. In fact the following suggestion falls into the 'time consuming at first - but very useful ever afterwards' category. So, let's take a look at what's required to make your dip-meter that much more useful.

Suggestion 2: There are two modifications required to the dip-meter and, although they are both time consuming as I've mentioned ... it's time well spent! The first modification - for an existing dip meter is to wind a separate coil for a known (preferably low frequency) tuning range.

The diagram, **Fig. 1**, shows how an extra coil for the chosen dip-meter tuning range is prepared. Here you can see that there's an extra winding slightly above - but not connected to - the dip-meter's main tuning coil for the range you've decided to use (preferably, as already mentioned, below 1.5MHz).

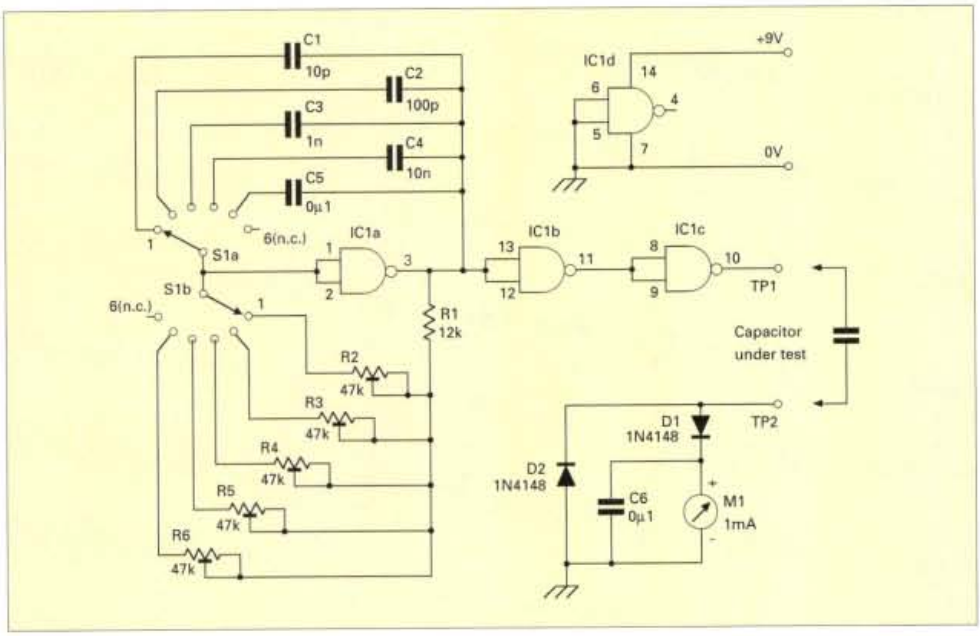


Fig. 2. The circuit diagram of the capacitor checker project, written by John Cushing G3KHC and originally published in the March 1992 issue of *PW*. It's very simple and straightforward as it uses a 4011 integrated circuit as a test oscillator and will 'check' a useful range of capacitors (see text).

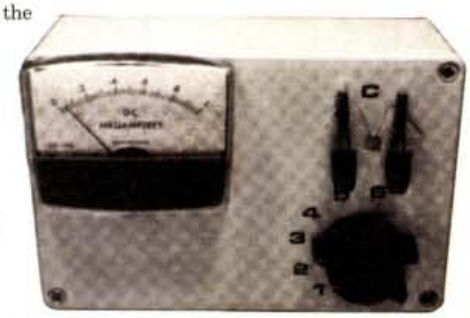
The extra winding in Fig. 1, is of course the separate coil I suggested in Suggestion 1. However, with this approach you don't have to worry about coupling the coil to the dip-meter's coil - as it's already done for you! All you have to do is to select a capacitor with a value suitable to provide the necessary 'dip' on the dip-meter as close to the highest tuning range on the dipper's coil - as possible. Any other capacitor - connected via the croc clips - will add capacitance to the circuit and lower the frequency. This method comes into its own for checking lower value capacitors, and is excellent for checking out the maximum and minimum values of 'bargain buy' variable capacitors.

The next stage is to make a replacement 'tuning' scale that, instead of being marked in frequency, is calibrated with marks indicating the points where good, deep, 'dips' are obtained with known value capacitors connected across the croc clips.

The system is simple and very practical although of course (depending on the range you choose to work on) there will be a limit to the highest value capacitor you can check - due to the frequency 'swing' of the dip-meter on that range. So, my advice is that for maximum capacitance measurements (let's say up to 500pF or so) you use the lowest range possible on the dip-meter. The lower in frequency the oscillator the more capacitance will be required to 'shift' it down by the addition of the 'unknown' capacitor in the croc clips.

Unfortunately, if you use a frequency that's too low (below 500kHz you'll find the 'tuning' scale (marked in capacitance) too difficult to calibrate - so you've got to adopt a compromise and choose somewhere between 500kHz and 1.5MHz. (Not a problem if you've built the 'Tinny Dipper' - but open to experimentation if any other dip-meter is used).

As I've said - setting up the dip-meter to check capacitors is a bit time consuming, but it's also time that won't be wasted. You'll become more familiar with a very useful item of test equipment and one that I think is sadly under-used nowadays.



The completed 1992 project (see text).

Complete Project

If you feel confident enough to 'have a go' building a 'tried and tested' project for trusting capacitors there's an ideal circuit for you in **Fig. 2.** This project, written by **John Cushing G3KHC** and originally published in the March 1992 issue of *PW*, is very simple and straightforward as it uses a 4011 integrated circuit as a test oscillator, with Meter, M1, providing an indication. The unit is useful for testing capacitors from around 100pF to 1µF.

The photograph, **Fig. 3**, (reproduced from the original article, hence the black and white print) shows how simple the completed project is. Although the capacitor checker cannot be considered as a precision instrument - it's extremely useful. I know ... I built one myself!

The completed unit is particularly useful for checking capacitors of more than 300pF. And I find that for lower value capacitors the 'frequency shift' method I've already described, using the dip-meter, provides better indications of the lower capacities - particularly on variable capacitors. However, if you end up with both techniques being available - together they'll be very useful indeed.

I've arranged with our Book Service (as we've sold out of the March 1992 back issues) for a photocopy of the complete project - which includes constructional details - to be available for £1.50 including postage and packing (**For further details on the Book Service and how to order - see page 97**). So, if you do build one for yourself ... I think you'll enjoy the exercise and learn at the same time.

I hope you have an interesting time - and don't forget ... keep that workbench light switched on, soldering iron plugged in and yourself busy! *PW*

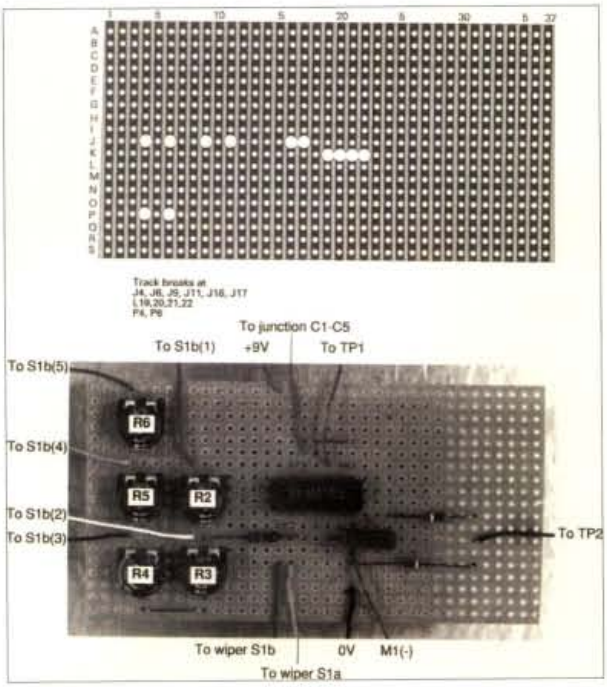
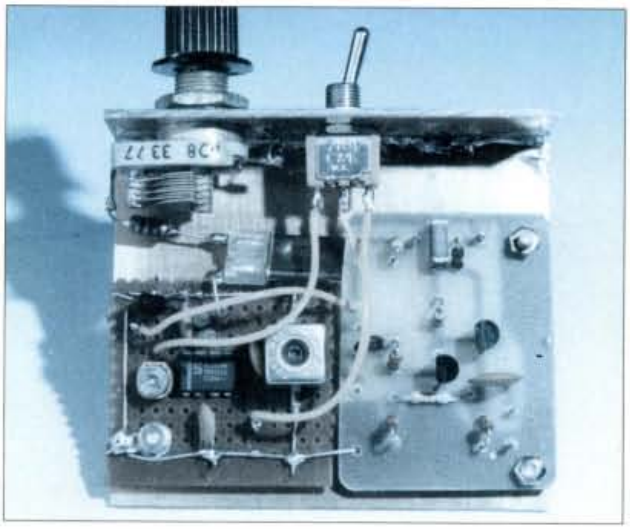


Fig. 3: Photograph of the original Capacitor Checker project as published in the March 1992 issue of *PW* (see text for further details).

Carrying on the Practical Way



This month's project - a VXO-Doubler, based on an integrated circuit.

"...multiplication is vexation!"

(From an Elizabethan Manuscript dated 1570)

This month the Rev. George Dobbs G3RJV describes a variable crystal oscillator (VXO) and doubler combination. He says it's "A simple way to generate a signal on two bands"... after you've read the appropriate quotation first!

A single band signal is relatively easy to generate, but it's a greater challenge to build a receiver or transceiver for more than one band. Hence there are a large number of simple Amateur Radio designs for single band equipment and very few for multi-band equipment. (One well known Amateur Radio kit manufacturer tells me that he can sell even the most complex single band designs but the multi-band kits are far more difficult to sell!).

The advent of digitally generated and processed signals has altered the whole way in which we can produce multi-band equipment. When I first began amateur radio construction, we used the harmonic relationships between the bands (3.5, 7, 14, 21 and 28MHz) to multiply up our generated frequencies to transmit on a range of bands.

In my early days in the hobby most Radio Amateurs used 'separates' (the receiver and transmitter were separate pieces of equipment). Very often the receiver was commercial, probably ex-military and the transmitter was home built.

The luxury of a complete transceiver, where the transmitted signal tracked the received signal and both were generated by the same source, came later. The problems of generating a signal for a transmitter and a superhet receiver, where the local oscillator is offset by the intermediate frequency, can be a headache. Anyone who sat down in the 1960s with a slide rule to work out a suitable crystal mixing arrangement that would not produce unwanted signals can probably remember pages of crossed out numbers!

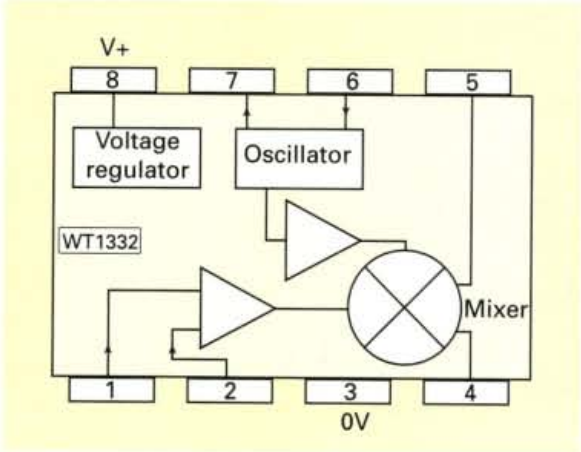


Fig. 1: The block diagram of the NE602 chip. The same information applies to the NE612, which has now largely replaced the NE602.

Harmonically Related

There's still some mileage in a using harmonically related signal generation for certain projects and QRP transmitters and direct conversion receivers for dual-band operation qualify for this approach. The two bands that come to mind are 7 and 14MHz.

The QRP calling frequencies for the two bands are harmonically related: 7.030MHz and 14.060MHz. The '40 metre' c.w. sector is a small frequency range and if the 7MHz signal is doubled to 14MHz, twice the frequency coverage of that band is available.

So, a simple method to produce a signal on both bands would be to have a variable crystal oscillator (VXO) around 7.030MHz and to double it to 14.060MHz. The VXO option will offer good stability over a limited frequency range on 7MHz and doubling would provide an equally stable signal on 14MHz with twice the frequency coverage.

Some time ago, **Ian Macpherson GM3RXU**, writing in *Sprat*, the journal of the G-QRP Club, suggested the use of the NE602 chip as a frequency generator and doubler. He used a ceramic resonator at 3.58MHz to provide a signal on this band and on 7MHz and the circuit I'm discussing this month uses Ian's approach to produce signals on 7 and 14MHz.

Block Diagram

The diagram, **Fig. 1**, shows the block diagram of the NE602 chip. The same information applies to the NE612, which has now largely replaced the NE602.

The NE602/612 contains an oscillator section, complete with a voltage regulator, and a balanced mixer. The oscillator is fed internally into one of the ports of the mixer. (This is the usual arrangement for a product detector or first mixer of a receiver, the internal oscillator being the local oscillator).

When another signal is fed into the other mixer port, the output signal of the mixer will contain both the input frequencies and their sum and difference. If that 'other signal' is the same signal as the local oscillator, the difference will be cancelled out and the sum **will be double the local oscillator frequency**.

Practical Application

The diagram, **Fig. 2**, shows a practical application of the principle. The local oscillator is a VXO using a 7.030MHz crystal in a Colpitts type circuit around pins 6 and 7. Some of the signal is coupled from pin 7, via C_X, to the input port at pin 1.

The mixer output at pin 4 will be the 14.060MHz (the sum of the two 7.030MHz inputs). There will also be some feed-through at 7.030MHz but a 14MHz tuned circuit on the output cleans up the signal.

The tuned circuit uses a Toko KANK3335 inductor with a 100pF capacitor. The choice of capacitor, C_X, which couples some 7MHz signal to the mixer external port is open to experimentation. A value of 22pF appears to work well. My prototype used a small trimmer capacitor to allow me to work out a suitable value.

The NE602 is working both as the oscillator and the doubler. It's also possible to pick off both the 7 and 14MHz signals by extracting some of the 7MHz signal from pin 7.

In this circuit variation of the crystal frequency is achieved by using an inductor (L1) and a variable capacitor. I used a 50pF variable capacitor and a 47μH moulded inductor but the VXO section is open to individual experimentation.

The amount of frequency 'swing' depends upon the type and individual crystal. However, I'll be 'guarded' enough to say, **it should** provide several kHz shift on 7MHz and twice as much on 14MHz.

Buffer Amplifier

The diagram, **Fig. 3**, shows a suitable buffer amplifier to follow the VXO-Doubler circuit. It uses the shunt feedback amplifier circuit so beloved by **Wes Hayward W7ZOI**, in *Solid State Design For The Radio Amateur*. (Avid readers of *PW* will know that I have used this circuit several times in the past to follow variable frequency oscillators).

Some degree of gain control can be achieved by adjusting the value (typically 10kΩ) in the base of the first transistor. I use BC183 transistors but any similar generic device should do the job.

With the values shown in Fig. 3, the amplifier gave around 2V peak-to-peak output on both bands. If adjustment of the output is required a 500Ω pre-set resistor could be used in the collector of the output transistor with the 10nF capacitor on the wiper.

Setting Up

Some care is needed in the setting up of the doubler tuned circuit. The core of the KANK3335 inductor is adjusted for maximum output on 14MHz. This can be done with an oscilloscope, if one is to hand.

The output can also be fed into a digital frequency counter and the core adjusted until a stable 14MHz frequency is displayed. A simple alternative is to monitor the output on a receiver tuned to the 14MHz signal and rotate the core for maximum signal.

As the photograph, **Fig. 4**, shows, I built the VXO-doubler circuit around the NE602 on a piece of 'Perfboard'. This section can be built first and tested before the amplifier is added.

My buffer-amplifier is fine example of Amateur Radio laziness! I already have several project boards that use this circuit, so I merely sawed off that portion from an old v.f.o. printed circuit board in the junk box. A miniature toggle change-over switch allows the buffer-amplifier to be fed by the 7 or 14MHz signals.

This little project could form the basis of a two band QRP transmitter or a direct conversion receiver. So, have a go for yourself and join the 'home-brewers' on the band! ***PW***

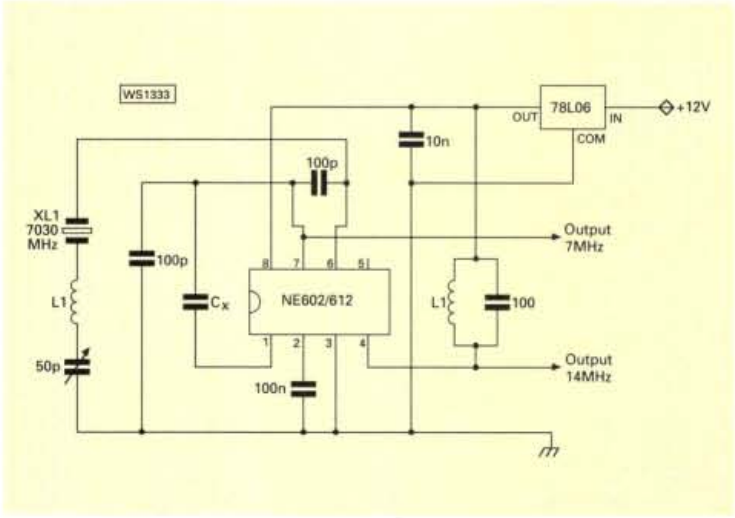


Fig. 2: A practical application of the principle behind this month's project. The local oscillator is a VXO using a 7.030MHz crystal in a Colpitts type circuit around pins 6 and 7. Some of the signal is coupled from pin 7, via C_X, to the input port at pin 1 (see text).

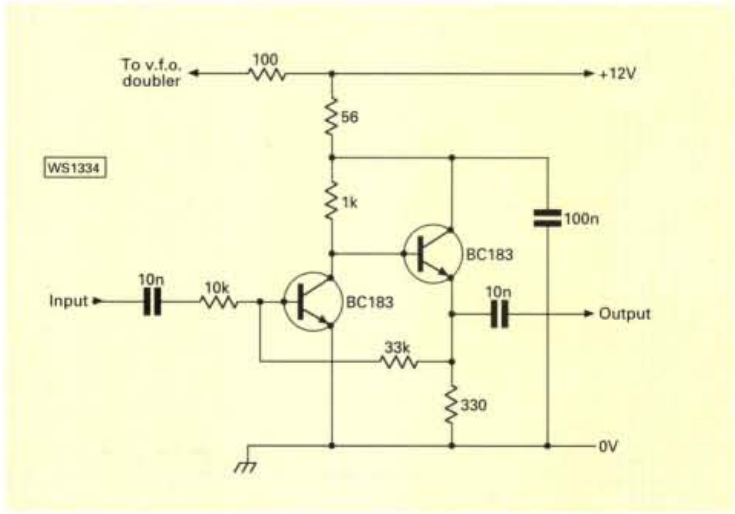


Fig. 3: A suitable buffer amplifier to follow the VXO-Doubler circuit. It uses the shunt feed-back amplifier circuit so beloved by Wes Hayward W7ZOI, in Solid State Design For The Radio Amateur (published by the ARRL).

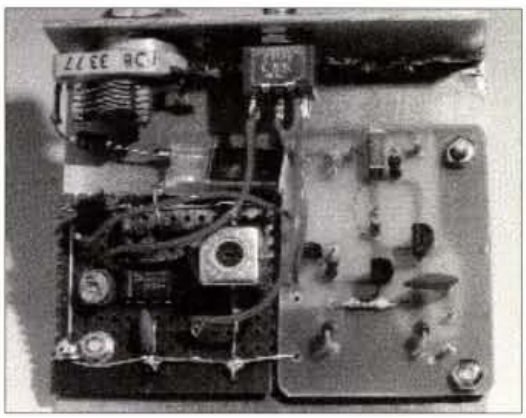


Fig. 4: The VXO-doubler circuit built by G3RJV around the NE602 on a piece of 'Perfboard'. This section can be built first and tested before the amplifier is added (see text).

Take care of your sensitive radio equipment

Installing An Over-Voltage Protection Unit

Alan Messenger
G0TLK

describes a simple device that could prove useful in the shack - and if anything goes wrong with your power supply unit it could also save you a great deal of money!

Most of us use a large mains power supply unit (p.s.u.). Some of these have over-voltage protection ... but many do not. Component failure or disconnection of 'sense' leads can result in 20V or more appearing at p.s.u. output sockets, with much expensive smoke (this happened to me!). A 12V 3A power supply unit (p.s.u.) was in use with an experiment, drawing about 1A. That session ended with a fried p.c.b. as it ended up with 22V on the power rails!

The project I'm describing in this article reduces the risk. It very quickly senses an over-voltage and removes it from the load before damage is caused. Better safe than sorry!

Thyristor Crowbar

The over-voltage protector uses the simple thyristor crowbar circuit shown in **Fig. 1**, for which I claim no originality. A thyristor is a form of diode, which does not conduct until triggered by a suitable gate voltage and current. It then continuing conducting until the power is removed, regardless of further changes on the gate.

In Fig. 1, if the gate is biased sufficiently to make the thyristor conduct, a short circuit is placed across the offending power supply. The resultant current blows the fuse, isolating the load. During the time taken for the fuse to rupture the thyristor 'short' keeps the load voltage low.

The gate trigger is derived from D1, R2, and R1. A power thyristor needs about 50mA for reliable triggering. This varies for each individual thyristor, making setting by using a zener diode alone rather difficult.

In this unit, R2 controls the gate current and voltage. As the output from the p.s.u. rises these increase until the trigger level is reached. The zener diode removes most of the applied voltage, preventing the maximum gate rating from being exceeded and minimising dissipation in R2 and R1 and C1 remove r.f. and other short transient waveforms.

Current Surprising

The short circuit current magnitude is surprising. In a linear supply with (let's say) 20V prior to the regulator and a smoothing capacitor of 50 000μF the capacitor contains 10 Joules of energy - Joules= 0.5 (CV^2) or 0.5 * 20 * 20 * 5.10^{-2}. In theory it will provide 10W over one second, or in the (typically) 1mS taken for a fuse to blow, **some 10kW**!

By Ohms Law, a peak current in the order of 500A (10 000W/20V) could flow before the fuse ruptures. This explains the big sparks on shorting out a large fully charged capacitor with a screwdriver!

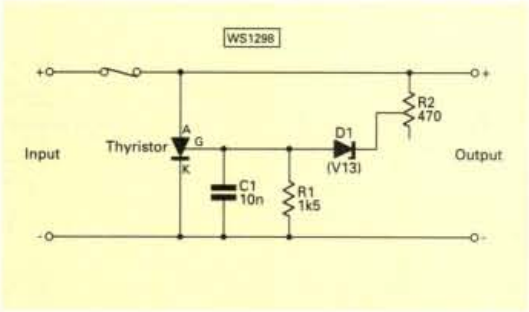


Fig. 1: Circuit of the simple 'over voltage' unit installed by G0TLK. It's small enough to be mounted inside an existing p.s.u. (see text).

The current cannot be accurately calculated since the circuit impedance is both unknown and dynamic. However, the rapidly increasing resistance of the melting fuse limits the peak, which is unlikely to reach more than about 10-15 times the fuse rating. For best protection the fuse should be a 'fast blow' type and of the lowest rating compatible for current drawn. (A typical 20A fuse should limit the peak to around 300A).

Due to the milliseconds duration of the event, only the thyristor peak current rating is relevant. The applied voltage is low, but the rate of rise is high.(I've not calculated this factor, known as dV/dT, since it too depends on the unknown circuit impedance).

Higher voltage thyristors seem to have higher dV/dT ratings. Searching through a selection of catalogues led me to the MCR256-10 from Farnell, and this device has peak ratings of 525A and 800V.

Construction Simple

Construction of the unit should be quite simple. A printed circuit board is not justified, but you could use stripboard (matrix board). I built mine in the 'ugly' style much favoured by the **Rev. George Dobbs G3RJV** (see the 'Carrying On The Practical Way' series).

In practice, the unit is wired in series with the p.s.u. output either within the supply itself or as an outboard unit. To avoid excessive voltage drop all high current connections must be stoutly made. This also applies to thyristor anode and cathode connections and is particularly important if stripboard is used. **Do not rely on the copper strips - they cannot carry the fusing current and may melt before the fuse, so you lose protection.**

Shopping List

R1 - 1500Ω 0.25W resistor
R2 - 470Ωpre-set resistor, 0.6W **(not sub-miniature)**
D1 - 13V 1.3W zener diode
Thyristor - MCR256-10, or better (800V @ 500A peak current)
4mm output sockets
4mm plugs
Miniature blade type fuse
Two 6mm female spade connectors
6 sq. mm. flex
Plastic box

Setting up is best carried out with a current limited power supply and voltmeter. Apply a low voltage and slowly increase it until the unit trips. To avoid overheating the thyristor remove the power as soon as it trips. Adjust R2 for a 'trip' around 14.5V. If adjustment is too critical try changing R2 to 100Ω in series with a 220 or 270Ω 0.6W fixed resistor.

If your test supply is large enough you may even hear a 'click' from the thyristor as it conducts. This occurs because the large current pulse makes the silicon wafer inside heat up and it expands suddenly. However, the pulse is short and no heat-sink is needed.

It's a simple project, but in its simplicity you'll get that extra little bit of electrical protection. And above all ... it can save damaging your expensive radio equipment! PW

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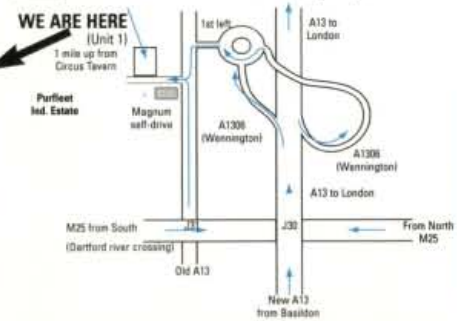

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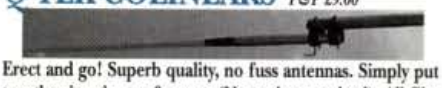

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'Andy The Light'

'Andy The Light' Bluer G3UUZ at his kitchen window sill operating position - Bishop Rock Lighthouse.

The 1998 'Lighthouse and Lightship Activity Weekend' saw G3UUZ 'Andy The Light' Bluer operating as a Radio Amateur once again from a lighthouse, and in this article he tells you how he found a happy medium between being a lighthouse keeper and a Radio Amateur.

In November 1965 I created a piece of history when, as GW3UUZ, I became the first UK amateur to have a lighthouse named on his licence as the main address. And it wasn't achieved without first cutting through a bundle of 'red tape' either! (See **Fig. 1**). The GPO, never a body to create precedents, witheld the granting of the licence until assurances from the Corporation of Trinity House were received to say that they had no objections to its issue. The help of **Ron Broadbent G3AJJ** is acknowledged here for it was he who, as a senior employee of Trinity House, spoke upon my behalf in the right quarters.

At the address in question, **Nash Point Lighthouse** (see **Fig. 2**) in South Wales, my first rig was a B2 spy set bought for thirty shillings (£1.50) with an extra capacitor wired across the 3.5MHz coil to give coverage of the 1.8MHz band.

The v.f.o. on my B2, which was twice the size of the transceiver, came from an ex-Ministry Of Defence (MOD) ET-4336 transmitter and consisted of an 807 valve in a tuned plate tuned grid configuration, using two large roller coaster coils. The receiver was an Eagle Star 550.

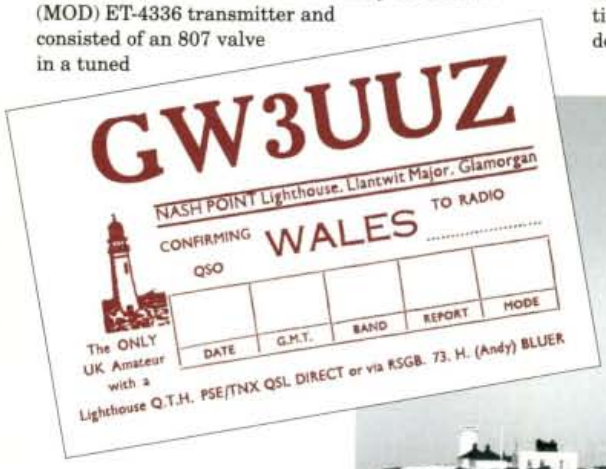

Fig. 1: 'Andy The Light' GW3UUZ's QSL card which he used whilst at Nash Point Lighthouse.

First Antenna

A 27m (88ft) sloping wire from the shack to the lighthouse gallery was my first antenna at the lighthouse and, initially, all operation was done on c.w. The lighthouse, situated on a 30m (100ft) high cliffs overlooking the Bristol Channel, afforded a clear take-off for r.f. over the 250° arc from NE through south to WNW!

The first shack at the lighthouse was a redundant toilet (see **Fig. 3 & 4**), but soon afterwards I requisitioned a granite outhouse and I constructed a 2 × 1m (8 × 4ft) bench (see Fig. 1). Apart from my operator's chair, there was also a comfortable easy chair and a bed-settee in the shack.

From the window over the bench, I removed one small pane. This was then replaced with a piece of clear plastic in order to allow for the easy drilling of holes to bring the feeder into the shack.

Outside, the soil depth was only 600mm (2ft) over solid rock and an area was dug out and a 900 x 600 × 100mm deep copper tray buried therein with a copper strap threaded under the window frame into the shack. This 'earth' was later connected to a counterpoise system of wire in three 'legs' of 152m each. (See **Fig. 5**).

This first antenna had now become a 40.5m vertical wire suspended from a cord stretched between the top of the tower to a pole some 61m away in the rising ground behind the shack. Although a number of different bits of equipment were acquired and disposed of during this time, it was decided that my next 'buy' would be a decent receiver.

Fig. 2: Nash Point Lighthouse. Andy's second shack is the small building on the far right.

Since writing this article, 'Andy The Light' Bluer has been awarded a **BEM** "For Meritorious Service". Congratulations, Andy, from all here at *PW*!

Fig. 3: Andy GW3UUZ's first shack at Nash Point Lighthouse was a converted toilet. In this photograph you can see Andy on the 'throne'.

Fig. 4: GW3UUZ's first station layout at Nash Point Lighthouse in the converted toilet. Note: the size and price of that Callbook!

Bargain Price

I bought a **Hammarlund HQ-180A** at a bargain price but it needed a complete overhaul and 'peaking' - a task carried out by a local professional engineer ... for free! How lucky can you get?

I acquired yet another transceiver - this time a **Heathkit DX-100** - which was also 'screwed up' to contest pitch! Very rarely was a DX station called that didn't reply - even rarer was an unanswered CQ call!

I extended my antenna by adding another 40m from the top of the vertical section horizontally, towards the pole in the field behind the shack. This had the effect of raising the 'take-off' point for r.f. well above ground.

The 1.8MHz band was my favourite and, getting paid for being active at hours when most UK amateurs were asleep enabled me to qualify for my WAC award (endorsed for 1.8MHz c.w.) quite quickly. In those days, of course, there was a 10W limit when working 1.8MHz.

So, where did my title - 'Andy The Light' - come from? Well, in Wales, tradesmen and artisans were often referred to by their professions. 'Jones The Milk', 'Evans The Bread' and so on. (There was even an undertaker who was known as 'Dai The Death'!).

My first name is Handel - I was named after the composer - and to begin with, whenever I used the microphone, difficulties were soon encountered. Continental operators would ask: "What's your handle"? - only to be told "the handle is Handel"!

A friend of mine then suggested that I use 'Andy' in future in order to avoid further confusion and, in any case, it seemed easier to hand when using the key. Later, a Reverend gentleman - a 'regular' on a 3.5MHz net proposed that I be referred to as 'Andy The Light', in keeping with the above mentioned Welsh custom ... and it stuck!

Only Amateur Active

For quite some time - apart from **Bill Hooper ZB2U** - I was the only Radio Amateur active from a lighthouse. I often wondered just when I would make contact with another.

Well, my chance came on the 19th February 1966 when I called **GM3TMK/A** (who wasn't actually a lightkeeper) who had been given permission to hang an antenna from the tower for a limited period at **Tarbat Ness Lighthouse**, Rosshire.

My next 'Lighthouse to Lighthouse' contact was with **GM3VBB/A** - an electrician with the Northern Lighthouse Board, This contact was made when he was working at **Duncansby Head Lighthouse**, John O'Groats on the 26th November 1968.

Friends from the **Port Talbot ARC** often used the facilities at Nash Point Lighthouse for contest working, especially the RSGB 7MHz contest. For this the big antenna was replaced with a 40m dipole at 40m high running north/south fed with 80Ω flat twin.

A terminated Beverage antenna of 402m length, running due west at 3m high, was used for receiving. As you can imagine, with a group of operators covering the 24 hour contest period, the easy chair and the bed-settee I mentioned earlier were very much appreciated.

Each time the Port Talbot ARC entered, they were always a good hour ahead of their main German rivals into the USA which allowed them to amass quite a few points

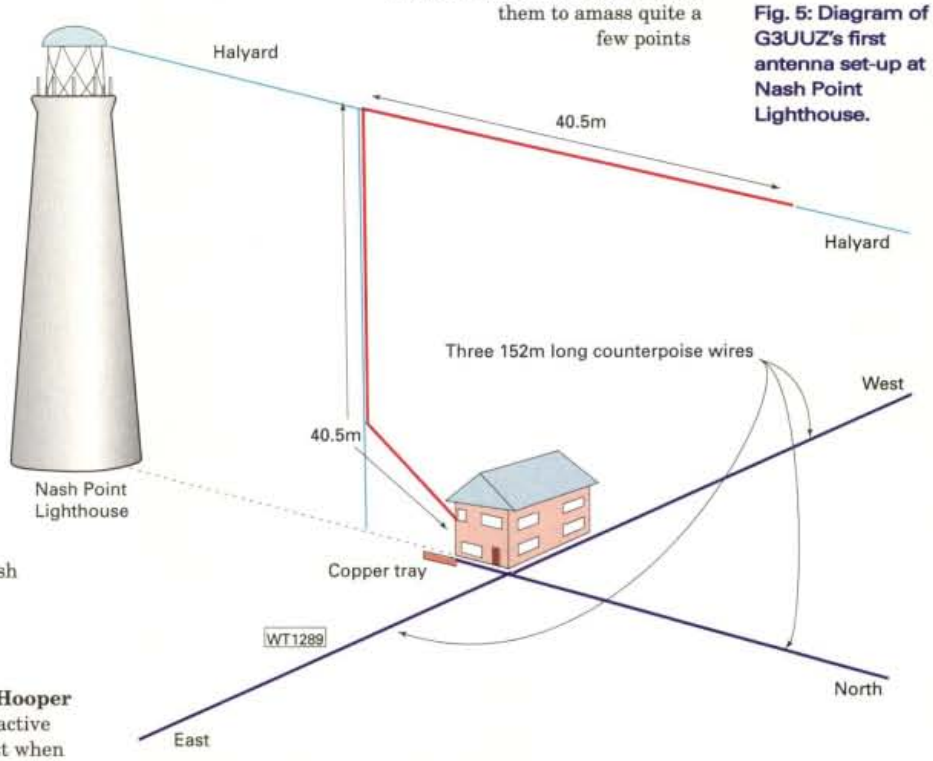

Fig. 5: Diagram of G3UUZ's first antenna set-up at Nash Point Lighthouse.

Fig. 6: Skerries Lighthouse. Andy G3UUZ's antenna set-up at this lighthouse stretched across the lagoon. You may just about see the antenna in the foreground of the photograph.

before they too got among the 'Ws'.

Lighthouse keepers don't remain at any one station for very long and so it was with me. A transfer to North Wales allowed operation to take place from the **'Skerries'** - a group of rocky islets north west of Angelsey. Here the antenna was another 80m length of wire, but this time it was slung horizontally from the top of the tower across a lagoon to another islet to the west. (See **Fig. 6**).

It was from the Skerries (it is believed) that the first contact via Amateur Radio between serving keepers on lighthouses took place when, on the 9th October 1972, when I worked **Stewart GM3UA/A** serving at St. Abbs Head Lighthouse, Berwick.

Stewart had joined the Scottish Lights Service earlier that year and had been persuaded to take his gear with him as he travelled to different stations during his training period. This resulted in contacts with **Skerryvore**, **Bell Rock**, **Sumburgh Head** (Shetland), **Cape Wrath**, **Holy Island** and **Pladda**.

Brief Stays

Following a brief stay at **Anvil Point Lighthouse**, near Swanage, I was then transferred (in 1973) to the famous **Bishop Rock Lighthouse** - a 56m tall tower, 11km west of the Isles of Scilly.

During this posting, Stewart and I achieved what we believe may be the longest (r.f. distance) contact in the UK when we had an 3.5MHz QSO between Bishop Rock (49°52min North 06°26min West) and **Muckle Flugga** (60°51min North 00°53min West) the most south westerly and northern rocks in the British Isles! Sadly, a feat that will almost certainly never be repeated.

By this time, the DX 100/HQ180a combination had long since been disposed of in favour of a more compact outfit. The first rig used at the Bishop was a **Heathkit 3.5MHz** s.s.b. only transceiver placed on the inner window sill in the kitchen about two-thirds of the way up from the base of the tower.

A vertical dipole was hung from gallery around the lantern which, fortunately, brought the feed point opposite the window. Only four metres of coaxial was needed to connect the rig to the antenna.

With 20W out, a CQ call resulted in a mini pile-up with many PY stations replying. This sounded promising but - as the bottom leg of the dipole wouldn't survive the winter waves - a complete rethink was required. I settled for a 27m vertical with its base at 24m above sea level (a.s.l.).

The lighthouse authority, Trinity House, had decreed that no antenna should extend above the roof of the tower. In 1976 an all-steel helicopter landing pad was constructed above the lantern and around the periphery of the 'pad' was a two metre wide nylon safety net.

Moving the rig - now an **FT-201** - into the room below the kitchen meant that I could now get the vertical to 30m in length into the nylon netting where it was threaded round, forming a loop of 20m. A 7MHz 'Halo' at the top of a 30m vertical! Earthing was achieved by running a counterpoise for each band under the lino in the shack. As far as I know it is still out there! (See **Fig. 7**).

During mid-1977, when UK amateurs could use a GE prefix to celebrate the silver jubilee of the accession to the Throne of Queen Elizabeth II ... I switched on the rig at 0100 one morning on 14MHz and was still 'at it' at 0500 working Ws from New York to New Mexico and from Florida to Fairbanks (Alaska) at the rate of two a minute!

Fig. 7: Bishop Rock Lighthouse. The 'early' antenna can just be seen in the right upper half of the picture.

Ashore Again

I came ashore again in 1981 with a posting to **Pendeen Light** (see **Fig. 8**) about half way between Lands End and St. Ives on the north Cornish coast. The antenna here at Pendeen Light was 60m long at 10m high and, although it worked well, I really missed the big verticals.

Fig. 8: Pendeen Lighthouse - the last 'posting' - 1981-1993.

I miss them even more now for, since retiring around six years ago, I have moved into a bungalow with a garden only four metres by four metres. It was then that the real challenges came!

My present antenna is an end-fed 'invisible' wire, three metres across and three metres down again - like a goal mouth - but it seems to work around the UK on 7MHz and further afield (California) on 21MHz with an Alinco DX-70TH transceiver and counterpoises for each band.

Plans are afoot to try a tall multi-band vertical antenna as soon as I can persuade the local authority of its necessity!

PW

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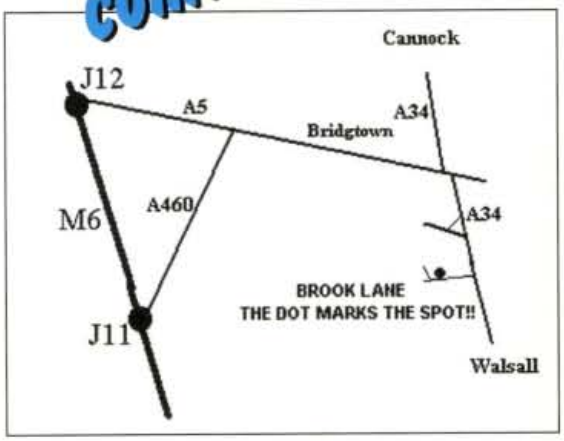

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TRIDENT	TRX-100XLT AM/FM SCANNER	£200.00
UNIVERSAL	M-8000 TERMINAL	£500.00
YAESU	FT-10 HANDIE 2M	£100.00
YAESU	FT-1000MP AC	£1,599.00
YAESU	FT-11 2M HANDIE	£140.00
YAESU	FT-11 HANDIE 2M	£100.00
YAESU	FT-290R11 2M MULTI MODE	£275.00
YAESU	FT-51R DUAL BAND HANDIE	£249.00
YAESU	FT-690 6M MULTI MODE	£295.00
YAESU	FT-707 100W HF	£250.00
YAESU	FT-747 TRANSCEIVER	£350.00
YAESU	FT-8100R DUAL BANDER	£250.00
YAESU	FT-840 0-30MHz TRANSCEIVER	£495.00
YAESU	FT-847 HF/6M/2M/70CM	£1,099.00
YAESU	FT-920 AF TRANSCEIVER	£999.00
YAESU	FT-2500M 2M FM MOBILE	£195.00
YAESU	FT-730R 70cm/FM	£100.00
YAESU	FP-707 PSU	£95.00
YAESU	FT-8500 2/70cm	£275.00
YAESU	FT-8100 2/70CM	£175.00
YAESU	FT-847	£1,099.00
YAESU	FT-650AC 6M 100W	£595.00
YAESU	FT 767 GX 2M/6M/70CM	£799.00
YAESU	FRG-100 plus PSU	£350.00
YAESU	FT-736R 2M - 70CM BASE UNIT	£700.00
YAESU	FRA-7700 ACTIVE ANTENNA (NEW)	£60.00
YAESU	FT-757 GXMK1 TRANSCEIVER	£400.00
YUPITERU	MVT- 7100 SCANNER	£150.00
YUPITERU	MVT-9000 SCANNER	£225.00

What Do You Get When You Cross ...

Cigarette Cards & Wireless?

Bet you never thought that smoking could be good for you? Well, Neville Denson says that back in the late 19th and early 20th Century, cigarette companies were issuing cigarette cards that would have been of great interest to Radio Amateurs.

In these days of open and almost constant hostility towards smokers and the tobacco companies, it's pleasing to be able to reflect on cigarette cards as one good thing tobacco brought. They were issued in cigarette packets from the 1880s until the outbreak of the Second World War and wireless wasn't ignored by the tobacco companies. As thousands of smokers across the nation opened their packets, up would pop a picture having a connection with what was then a new, exciting and revolutionary subject. The heyday of the cigarette card coincided with the advent and development of wireless and it's not difficult to imagine the excitement of the smoker, opening his packet, perhaps hoping to learn more about his new-found interest.

Few Magazines

Remember that, in those far-off days, there were few magazines - they didn't become common until the 1920s and even *Practical Wireless* didn't appear until 1932. Before then, most knowledge on any subject usually had to be sought from huge, scholarly books. This would be a daunting prospect to most people and on a subject as new as wireless, there was probably little literature available to the man in the street, therefore, interest in finding what you could from your cigarette packet became all the more intense.

As a hobby, wireless could also have determined what brand you smoked because different tobacco companies would become known as issuing cards on certain subjects - be it sport, military, wild life, transport or whatever. Some cards on wireless were to be found in sets that didn't immediately suggest a connection.

Examples of this include 'Military Motors' - issued by Wills' as far back as 1916 which carried cards of 'Wireless Motors'. One such card, describing the British vehicle, told of the "latest methods and inventions of modern science" being "utilised on the battlefields of the Great War. (See **Fig. 1**)".

The card went on to say that "field communications are much simplified and rendered more efficient by the aid of Wireless Telegraphy" and explained that the car carried a complete

Fig. 4: A cigarette card which gave you directions? No. 56 in Gallaher Ltd's 'Boy Scout Series' claimed to know a clever trick using telegraph poles. (See text).

Fig. 5: A Wills' card, this time giving some practical advice on how to make a wireless "earth". (See text).

Fig. 3: This card, No. 100 in the series called 'The Reason Why' and issued by Gallaher Ltd., looked at why valves and crystals were used in wireless. (See text).

Fig. 12: One of the R & J Hill Ltd cigarette cards issued with Sunripe Cigarettes entitled 'Wireless Telephony'. This one is No.74 and show a 'Low Tension Accumulator'.

Fig. 13: The No.4 in the 'Wireless Telephony' series showing an 'Inductance Coil'.

Fig. 2: Another Wills' cigarette card of the 'Military Motor' series this time dealing with the Italian vehicle. (See text).

Fig. 1: A Wills' cigarette card entitled 'Military Motor', sub-titled 'Wireless Motor - British'. (See text).

wireless outfit with the mast in sections on the side of the vehicle "ready for fixing together and making into the tall antenna, which is necessary for transmitting and receiving the electrical oscillations or waves".

A similar card of an Italian vehicle, showing the antenna being erected, noted that wireless had "revolutionised the methods of field telegraphy". That "to the Italian forces fighting in the mountainous districts of North Italy, wireless telegraphy is of inestimable service". (See **Fig. 2**).

Many Sets

There were many sets of cards which must have improved the general knowledge of a multitude of people. Sets with titles like 'The Reason Why', issued by Gallaher in 1924. The final card in this set of 100 was on 'The Reason Why Valves And Crystals Are Used In Wireless'. (See **Fig. 3**).

These cards said that when wireless waves were received on an antenna, "the current of electricity had to be made to flow one way only" and that "crystals or valves will allow electric current to flow through them in one direction only and therefore act as a kind of filter to the received vibrations". The card went on to state that "a valve can also be made to perform the function of amplifying or magnifying the sounds".

Be Prepared

We all know that Boy Scouts should 'Be Prepared' and Gallaher Ltd published another series of 100 cards in 1922 called 'Boy Scout Series' with the aim of helping Scouts. (See **Fig. 4**). What isn't clear is whether the aim was to get the boys to smoke or their fathers to give them the cards from their packets! (What is clear is that they didn't intend to let the Scouts get lost).

Showing a telegraph pole, this particular card (No.56, 'Telegraph Pole Signs') advised that "If when coming unexpectedly upon a main road you are in doubt as to which direction to turn for London, or when in Ireland for Dublin, the telegraph poles will always solve your difficulty, as the cross-bars at the top are always affixed to that side of the pole which is looking towards London or Dublin". That information must have saved countless wasted miles for the multitudes of Boy Scouts who daily set out to walk to London or Dublin seeking their fortune and their navigator's badge, no doubt!

Continued on page 32...

Fig. 7: Another Odgen's cigarette card entitled 'Marconi Steel-Tape Machine'. No. 46 in the 'Broadcasting' series. (See text).

Fig. 6: This Ogden's cigarette card reported on the launching of *Orion* by H.R.H. The Duke Of Gloucester by wireless in Brisbane. (See text).

Fig. 8: (right) "Senator Guglielmo Marconi" was himself immortalised in a set from Player's Cigarettes entitled 'Straight Line Caricatures'. (See text).

Fig. 9: (left) Godfrey Phillips Cigarettes brought out their own set of cigarette cards entitled 'How To Make Your Own Wireless Set". This card, No.13, looks at 'Mounting Variable Condenser'. (See text).

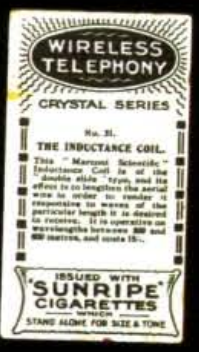

Fig. 14: Another 'Inductance Coil' from the same Sunripe Cigarette series - this card is No.31.

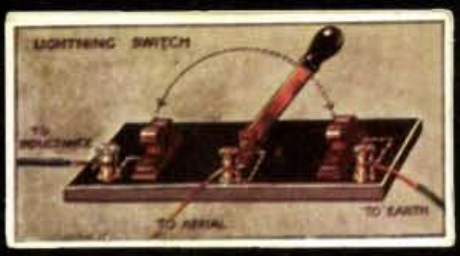

Fig. 10: The No.21 card in the Godfrey Phillips Cigarettes series entitled 'The Lightening Switch'. (See text).

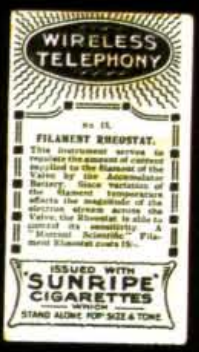

Fig. 15: A 'Filament Rheostat' shown on card No.13 in the 'Wireless Telephony' series.

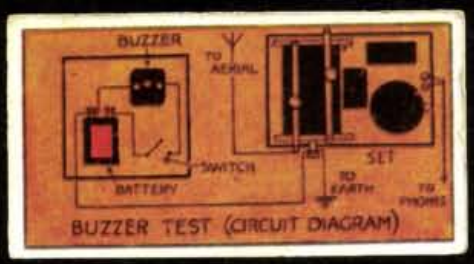

Fig. 11: The 'Buzzer Test' cigarette card from Godfrey Phillips is No.22 in the 'How To Make Your Own Wireless Set' series. (See text).

Cigarette Cards & Wireless?

Continued

Practical Information

A 1936 set of Wills' 'Household Hints' provided what was probably more practical information on a card that told how to make a wireless 'earth'. (See **Fig. 5**). The method was to "Run an insulated copper wire from the earth terminal of the set to the knife-switch connecting it with the down-lead ... and from there lead it into the open, where it should be 'earthed' in the shortest possible distance".

Fig. 16: Card No.58 of the Sunripe Cigarette series shows a 'Marconiphone Range Block'.

This particular set of cards claimed that a good earth was made "by soldering the end of the wire to the side of an old galvanised bucket in which a few holes have been punched". The bucket should then be "tightly filled with damp earth and buried". Better results could be obtained, said the card, if two buckets were used.

It also told us that to be efficient an "earth ... must be kept damp; an inverted flower pot buried above the buckets and level with the earth enables a funnel to be inserted for watering". It's interesting to note that the word "earth", when used in an electrical sense, merited inverted commas on the card. This is presumably because it was, at that time, still a new and not fully-accepted word - probably seen as jargon or slang.

Excitement & Wonder

The era in question was (arguably) the time when, more than any other, the world shrank and it's difficult in today's world of supersonic flight and the Internet to recapture the excitement and wonder that people must have experienced as wireless progressed. Imagine, for example, the thrill of knowing that HRH the Duke of Gloucester was launching the *Orion* at Barrow-in-Furness by wireless impulse from Australia on 7th December 1934.

A card from Ogden's in a 1935 series called 'Broadcasting' (see **Fig. 6**) described the launching of *Orion* as "one of the many wonders of Empire wireless". It went on to say that "At the same time a description of the scene at Barrow-in-Furness was broadcast throughout the Empire by means of the BBC's special Empire service, which is maintained for the benefit of the Dominions and Colonies".

Fig. 17: A 'Tuning Spade' is found on No.71 of the 'Wireless Telephony' series issued by R & J Hill with Sunripe Cigarettes.

The same series had a card with a Marconi steel-tape machine which, with 3mm wide tape would "run for about half-an-hour" and could be "wiped" for re-use. (See **Fig. 7**). The widest application of this method was in the Empire programmes 'many of which have to be repeated four or five times during the 24 hours in order to reach different countries at a suitable time'.

It's hardly surprising that Marconi himself was immortalised on the cards. He was to be found in a number of series and Player's included him in a 1926 set of famous people called *'Straight Line Caricatures'*. (See **Fig. 8**).

He's shown as "Senator Guglielmo Marconi" and described as "a Citizen of the world" who, at the age of 22, had mastered the problem of wireless telegraphy and as early as 1896 had invented an apparatus which would transmit messages several miles.

How To?

The firm of Godfrey Phillips seemed to have a special interest in wireless. They issued three sets in the 1920s - the forerunners of today's *How To?* books Called 'How To Build a Two Valve Set', 'How To Make a Valve Amplifier' and 'How To Make Your Own Wireless Set'. These sets each had 25 cards and must have been the initial attraction and spur to many people who later became practical wireless enthusiasts.

The 'How To Make Your Own Wireless' set was the first of these to be issued. It appeared in 1923 and we can but wonder at the frustrations as well as the excitement of the man who needed but one more card to enable him to complete his set - in both card and wireless senses.

One card, on a variable condenser (see **Fig. 9**), says that its capacity, when made up, "will be .0001mfd". It explains how it is assembled, concluding "A section of cardboard tubing is cut so that the side of the condenser is enclosed to keep out particles of dust which cause interference".

Another card in the same series (**Fig. 10**) tells us that the antenna acts as a most efficient lightning conductor. So "it is advisable to connect in the circuit a switch so that in the event of atmospheric electrical disturbance the energy may be transmitted to earth and so dispersed. If set is not so fitted, damage to the set may occur", we are warned.

The person who prepared the information for this card seemed to have a thought for the punter's pocket, saying that "An ordinary tumbler switch is quite excellent, while the single-throw switch is probably cheaper and just as efficient".

The 'Buzzer Test' (**Fig. 11**) is the title given to a third card and states that this test is used for determining the sensitive point of the crystal before reception is required. "The Buzzer, together with a key and dry pocket lamp battery, is mounted on a base" the card goes on. After which on the "Method of Procedure", it advises the user to "Depress switch with left hand. With right hand search the face of the crystal for the most sensitive point which, when found, will produce a slight buzz in the headphones".

'Wireless Telephony'

Another cigarette company, R & J Hill, were also well to the fore in the production of cards on this amazing invention. In 1923, they issued two sets with a total of 104 cards.

One set had 84 cards, called 'Wireless Telephony' and was issued with Sunripe Cigarettes. It explained the purpose of things such as a: 'Low Tension Accumulator' (**Fig. 12**); an intervalve transformer; an 'Inductance Coil' (**Fig. 13 & 14**); 'Filament Rheostat' (**Fig. 15**); 'Marconiphone Range Block' (**Fig. 16**) and 'Tuning Spade' (**Fig. 17**) and showed, for example, the best way to fix an antenna spreader with insulator attached.

But these cards reminded us of the human face of wireless too, with cards about Marconi House and the man it was named after and Mr A. R. Burrows (Uncle Arthur) whose voice was "so well-known to listeners-in".

There's a strange irony in that, indirectly, smoking cigarettes must have brought 'a breath of fresh air' to many a working man and woman, living in squalid industrial areas with little leisure time. Imagine the thrill of the man who'd built his own set, following the advice on the cards, when he got his first sound from it and was carried far away from what was probably a very humdrum existence.

Cigarette Card Facts

Finally, to round this article off, here are a few facts which I imagine you never knew about cigarette cards:

1. Originally, blank cards were put in packets to protect the cigarettes.

2. Soon these were to contain pictures - quite something in an age when there was no radio, TV, cinema or colourful magazines.

3. Over the years there were to be series ranging from alpine flowers to aviation, from Gilbert & Sullivan to game birds and from boxers to butterflies.

4. Most of the many millions of cards issued will have been thrown away but many survive, some even in mint condition.

5. A set of 50 can still be bought for well under £10 but rarer cards fetch much more.

6. In 1987, £15 500 was paid for 20 'Clowns & Circus Artistes'. That price looks an absolute bargain and 'chickenfeed' alongside the $451 000 paid in New York in 1991 for a single card of a baseball player. Mind you, it was in mint condition! (The player was one Honus Wagner - a non-smoker!).

We've all heard about the waste of being a slave to the 'weed' - of money "going up in smoke". But I don't suppose many people ever thought that throwing away cards that popped-up from cigarette packets could, in time, prove just as wasteful.

PW

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010-10156-00	Swivel mount bracket for GPS-2/2+/3	£13.95
010-10115-00	Handlebar/rail mount for GPS-12/12XL/38/40/45XL	£10.95
010-10082-00	Power/data cable for GPS-2/2+/3/12XL/45XL	£17.95
010-10084-00	Cigarette lighter adaptor for GPS-12/38/40	£22.95
010-10085-00	Cigarette lighter adaptor for GPS-2/2+/3/12XL/45XL	£14.95
010-10086-00	Data cable (For NMEA interface no power connections) for GPS-12/38/40	£14.95
010-10141-00	PC interface cable (9 pin D serial cable) for GPS-2/2+/3/12/12XL/38/40/45XL	£23.95
010-10164-00	PC interface cable with cigarette lighter plug for GPS -12/38/40	£29.95
010-10165-00	PC interface cable with cigarette lighter plug for GPS-2/2+/3/12XL/45XL	£27.95
010-10142-00	Data transfer cable (unit to unit) for GPS-2/2+/3/12XL/38/40/45XL	£29.95
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Do Satellites & Steam Go Together?

On Track With Satellite Navigation

Many readers may be tempted to buy a 'Satellite' navigation (GPS) unit and Nottingham-based Ian Brothwell G4EAN has already found his Garmin GPSII Plus to be useful. Especially when he's travelling on the UK's franchised railways operated by contractors and the preserved steam lines run by enthusiasts. Read on to find out why!

It was a 'preserved' steam railway that gave me the excuse to buy a Garmin GPSII+. That excuse came on an annual day trip to Matlock in the Derbyshire Peak District, my friends and I would have a ride on the 'Peak Railway'. The line's westerly terminus was at a new station named Rowsley South.

The question: "Did we have time for a walk to the nearby village of Rowsley before the train returned to the other end of the line"? arose. We couldn't tell, Rowsley South station was too new to be on a map so we couldn't determine the distance (and thus the time) to walk to Rowsley. This was a situation I had an answer to!

For our next trip on the steam railway, I had a GPS unit into which I had entered the co-ordinates for Rowsley village. The train arrived at Rowsley South station, I pressed a button on the GPS and the distance to Rowsley village was displayed on the screen of my GPS unit and we saw that our walk would be feasible. Better still, once we got into a comfortable walking pace the GPS could reasonably accurately give us an Estimated Time of Arrival (ETA) for Rowsley!

Fig. 1: The Garmin GPSII Plus unit. (An add-on optional antenna unit is available for 'in car' use). Photograph courtesy of Waters & Stanton PLC.

Gozo Beacon

The next time I got to use of my GPS combined my interests in radio and in aviation in trying to find the Gozo aviation beacon while I was on holiday in Malta GC. Using my GPS in conjunction with a set of 1:25,000 maps of Malta and Gozo, and with the co-ordinates of the beacon entered into the GPS, I reached the beacon without any navigation errors whatsoever.

I confirmed the Gozo beacon's identity by copying its c.w. identification on my wide-band hand-held transceiver. My finding was further confirmed by seeing an aircraft making a turn almost directly overhead!

The ETA feature of my GPS was a great aid when walking back to the port for the ferry to Malta.

Once I had reached a steady walking pace the ETA feature showed me that I'd reach the port ten minutes before the ferry departed.

So, armed with the information from the GPS unit ... there was no need to break my pace to read a map or estimate the remaining distance to walk, I could simply relax and enjoy the lovely scenery of Gozo (I'd recommend 'Malta's Garden Island' to everyone!).

Where's That Train?

It's back to the train for my next use of the GPS. Let's just imagine I'm on the train home from London. It has been a busy day, I'm a little tired and engrossed in a magazine. It's dark outside and the train comes to a

Continued on page 36...

"After the train has passed through a tunnel my GPS takes only a few seconds to re-establish reception and once again tell me where we are. And if we stop 'in the middle of nowhere'... I know where we are"!

On Track With Satellite Navigation

...continued from page 34

halt in the middle of nowhere. Where are we and how long before we reach Nottingham?

My GPS is running and I see from its simple line map that we (the train and I!) are near Kettering. I now know where we are and, once the train is up to speed again, the GPS's ETA is usually quite accurate ... I'll probably know when we're due to arrive before an announcement is made!

On another train trip in the dark, just before Christmas 1999, we went past a tower crane decorated with a Santa and sleigh. I saw it too late to get out my camera ... but my GPS was running and I needed only to press a couple of buttons for it to record our position. On the return journey the GPS was set to display the distance to go to this tower crane and I got my picture!

Nearer to home, looking for a short cut through a new housing estate was made easier by using the GPS to plot a simple map of my walk around the estate. Useful eh?

Garmin GPSII Plus

My GPS unit is the Garmin GPSII Plus. As I had originally planned to use it for walking and cycling I didn't want a GPS that included maps as these are usually not detailed enough for walking (and I also greatly enjoy reading and using printed maps).

The GPS unit I've got has a display which can be used in either portrait or landscape. In use, its standard antenna can be unplugged and replaced with a remote antenna on a length of coaxial cable, which is the way I use it on a train.

I have used my GPS in a car and, placed on the dashboard it works well using its standard antenna. However, you can get a special antenna for in-car use. (The GPS-150 Active Magnetic Mount Antenna is available, prices are from £39.95).

Before leaving home on a journey on one particularly dark night, I loaded the co-ordinates of several turning points on my route into the GPS. Shortly before I reached each turning point the GPS' display would light up and I could confidently make the turn without needing to stop and confirm that I was at the correct point. This made the journey both quicker and more relaxing.

Finally, if like me you want to use a GPS on a train, then I recommend getting a GPS which will accept a remote antenna. You should also check that the GPS is receiving the satellites before boarding the train.

The GPS initially needs at least 30 seconds free of QRM to establish reception of the satellites and that may not be easy to get on a train. Once it has established reception then QRM causes little problems.

After the train has passed through a tunnel my GPS takes only a few seconds to re-establish reception and once again tell me where we are. And if we stop 'in the middle of nowhere' ... I know where we are!

There are very many uses for GPS units, whether it be for /P Amateur Radio operating or hill-walking. It's one of those systems that we'll always find new jobs for. I wouldn't be without mine! *PW*

How I Became ...

An Amateur By Accident

Dr John Cook
G0EQM
Responds to a request by Rob Mannion G3XFD

Some time ago, back in 1997, I was present when the Editor of PW, Rob Mannion G3XFD, gave a talk to the Southdown ARS (SARS). It was a fascinating talk by a fascinating man. After Rob's talk we spoke and he asked me to write an article for *PW*. "What about"? I asked to which he replied: "Tell us how you got into Amateur Radio and what you do with it now". So here goes ...

I first became interested in electricity at the age of four, I had a wonderfully eccentric but very practical Grandfather who was a physics teacher. For my birthday he bought me a 4.5V battery, a bulb and holder, a switch and some connecting wire.

I wired them up by putting a piece of wire on every terminal I could find and joined them all up in the middle. This, of course, didn't work and with great concern for the battery, my Grandfather pulled it apart and we wired it up properly together. That was the day I learned the principle of the electric circuit.

Myself and a friend liked getting together lots of plugs, sockets, switches, etc., and joining them all together with a battery at one end and a bulb at the other. The object being, of course, to get the bulb to light despite the electricity going through lots of bits.

Fig. 1: The PW-80 was featured in *PW*, back in December 1979. Here is the front cover featuring a young Dick Ganderton G8VFH who became Editor of *Short Wave Magazine*.

By the time we were eight we had a mains powered coloured light show which the grown ups were forced to watch which they managed with good grace and tolerance. I lost touch with my friend at the age of 11 - I wonder if you're reading this, John?

So, I was fine with electricity and one day I saw a radio controlled boat for sale in a shop window. It was a tinplate model complete with a massive (by today's standards) ground based transmitter with four buttons on the top.

I was interested in buying it but at £15 it was way above what I or my parents could afford. (I have since seen the same model in the National Museum of Radio Control Model Boats at Child-Beale).

Changed My Life

The day that changed my life was when I was about 14, I saw a programme on the TV about making a radio controlled boat. It was fascinating and I was instantly hooked - I had £5 and I decided that I had to make a radio controlled boat.

Unfortunately, I wasn't very good at making the actual boat, but my father came to the rescue and made that for me. I, on the other hand, concentrated on the works.

I started to take *Practical Wireless* at this time and the first issue I bought was December 1959 and I've taken it ever since. I needed to read about radios and there wasn't a specific radio control magazine available at this time.

I haven't got room to go into all the details of my first attempts but I acquired a few books on the subject of building radio controlled boats and co-operated with a couple of friends at school who were interested in model planes. After about five years, the boat we had built worked and it cost a bit more than £5 but it took so long that I managed to get a bit more money!

The transmitter I used first was carrier wave with no modulation (c.w.) and just had a push button switch in the h.t. supply to turn it on. When you let go of the switch and it was off again.

My transmitter was a double triode valve in a multivibrator configuration with a tuned circuit in the h.t. supply to the anodes and it is the most powerful radio control transmitter I have made. I would guess that its effected radio power (e.r.p.) was half a watt. These days the legal limit is 100mW which is more than enough to cover the few hundred yards required.

It worked really well for about three months and then packed up so I took it apart and built it again to no avail. At last I realised that the LT battery had run out!

This event taught me a very valuable lesson that I've never forgotten - namely that electrical apparatus doesn't work without a supply of electricity! Even today at work, if someone can't get something to work I ask them: "Is it switched on"?

Several Attempts

I had several attempts at building a receiver but totally failed at getting a super-regenerative set to work. During this time, the magazine: *Radio Controlled Models And Electronics* (*RCM&E*) was published and I bought the very first issue because it contained an article on a transistorised superhet receiver with an untuned i.f. strip which I later made.

The receiver would respond to anything, which would be no good nowadays, but back then it was quite rare to meet another fellow modeller at the pond. It was a 'current rise receiver' with a relay so that when it received a signal the current rose enough to pull in the relay when there was no signal the current dropped and the relay 'fell out'.

With the radio set-up providing one changeover switch, you had to be a genius to get a few controls working. However, with the aid of a gear chain from an old clock, a couple of 'Mighty Midget' motors, some bits of tinplate cut from an 'OXO' tin, four pulleys, two elastic bands and some very strategically placed sellotape, I could turn the drive motor on and off and work a 'progressive rudder' - this meant that I could put the rudder in any position, unlike a 'bang-bang' rudder which was either straight or fully turned.

Continued on page 40...

How I Became ... An Amateur By Accident

... continued from page 38

To set the system up, the receiver was adjusted until the relay 'fell out' and the transmitter was then turned on and adjusted until the receiver relay 'fell in'. I was supposed to be on the 27MHz band but, to this day, I have no idea what frequency I was actually tuned to! The 27MHz band had, in theory, six spot frequencies, 50kHz apart and later, 'splits' were added so the channels were 25kHz apart. All the rest of my systems have been crystal controlled so there's no doubt of the frequency nowadays.

In the next project, the transmitter was amplitude modulated with sine waves of different frequencies. The associated receiver was published in *RCM&E* in about 1965 and was a crystal controlled superhet working a reed unit.

Reed Unit

A reed unit is a device placed in the circuit where the loudspeaker would normally be for listening to audio. It has strips of magnetic material over the biased electromagnetic each of which have a resonant frequency so one strip vibrates for each sine wave transmitted.

The vibrating strip hits a contact and the signal is amplified from there, most set-ups in those days used relays but I used transistor amplifiers to control the surfaces. One frequency moved the rudder one way and another the other - the throttle on the motor was controlled by two more frequencies.

I was at university at this time and one of my fellow students was particularly interested (as a hobby) in the hydrodynamics of boat hulls. Together we had designed a flat rectangle of wood on which I placed all my 'works', along with the two control levers at the edge.

I could do whatever I liked on the wood as long as the control levers on the home-made actuators were in the same place. At the same time, he could build whatever he wanted as long as it accepted the piece of wood and work with the two control levers in the standard place.

We had a diesel engine in the three boats my friend made during this time because he wanted speed (the only time I haven't used electric engines) - I was (and still am) more interested in the control. I had a lot of problems with the vibrations from the diesel engine working all the reeds at once but cured them by mounting the receiver in a cradle suspended by elastic bands.

In 1965 I was about half way through my five and a half year university course and had learnt enough about radio by building boats and reading *PW* and *RCM&E* that I decided to take the RAE. I only had to study the Regulations, Part One.

I was used to taking exams, it's just a matter of doing a bit of swotting and the exam was in essay format. I seem to remember waiting well over two months for the pass slip but I didn't take the licence out straight away.

This delay was due to the fact that, at that time, there was only one radio licence and I didn't have time to learn Morse. Even if I had, if I wasn't on the air within a year of passing the Morse test I would've had to have taken it again and I still had the boats to satisfy my need for soldering.

About this time I bought and made a 10-12 oscilloscope from a Heathkit kit which worked first time. Over the years it's needed a new mains transformer and an EHT rectifier but it can still be used today, although the timebase is now a bit hit and miss.

By this time one of my friends from school was working for the BBC in the video tape department at the Television Centre. He taught me a lot about the line and frame sync pulses used in a TV picture and about counting rectangular waves and logic circuits.

Next Arrangement

The next arrangement I built was a fully proportional set-up with servos and the transmitter was amplitude modulated with a series of rectangular waves. One of them was extra wide to act as a synchronisation (sync) pulse, the others were variable in width to affect the control at the receiving end. In the boat the pulses were separated out and each fed to its servo to set the position of the control (e.g. rudder).

The fundamental difference between a servo and an actuator (mentioned above) is that the operator has to know where an actuator is and decide which way to move it and when to stop it moving. With a servo, the operator tells it where he wants it to go and it goes there no matter where it has started from and stops when it gets there.

(This is achieved by incorporating a negative feedback loop in the control mechanism of the servo so it "decides" which way to move and when to stop. All modern radio control equipment use servos).

The boat used one channel with a servo I made for the rudder and an electronic motor control which was my own design. There were no moving parts except for the motor itself.

I like a minimum of moving parts and all the logic was made from discrete components - I also had a home-made joystick in the transmitter. Using servo controls after actuators was a joy, control was so much smoother and there was

Fig. 2: The author of this article, John Cook, sent in this photograph of his motor torpedo boat (MTB) which, he says, was modelled on the type that his step-father was Captain of during the war.

much less brainwork involved as the servo did a lot of the thinking for me.

I was working part-time in several different places at this time and for two and a half days a week I did a research project at The Institute of Ophthalmology in London. (I only got this job because I knew something about electronics as I had to make the device which I was to use in the project).

When I had finished that job and written the paper there were a few months before I was due to leave and so I became a prototype wireman. The idea was that the electronic engineer gave me a circuit he had designed and the parts and I soldered it together at the bench.

What actually happened was that I took the bits and soldered them at home and during my work sessions I made my own circuits with all the facilities of an electronic lab and an electronic engineer on tap to help out if I couldn't quite manage.

The engineer's circuits always worked first time but mine often needed trouble shooting but it certainly helped to have decent test equipment. This was where I first learnt to use integrated circuits.

Out if this came a new set-up which basically did the same as my previous one but the logic was with TTL integrated circuits and based on a design published in *Wireless World*. The encoder and decoder were fine but the servo electronics were not good at all so I redesigned the circuit and sent it as an article to *Wireless World*.

Wireless World received the article about six months after the original article was published but, by the time it was published two years after, it was totally out of date as my six chip and six transistor circuit had been superseded by one i.c. Nevertheless, it worked in my boat OK using the same mechanics which were already there.

On The Back Burner

The following few years I was very busy working my way up the career ladder and soldering had to be put on the back burner. But having reached the top of the tree I decided to put a bit more time back into the boats.

I built an f.m. set-up using the radio frequency part of the PW-80 published in *PW* (see **Fig. 1**), my own encoder and a receiver from *RCM&E*. It had seemed a good idea to use f.m. ever since the days of illegal CB radio on 27MHz - which was the radio control band but which suffered from a.m. CB.

With the PW-80 (and all future equipment) I used CMOS chips for the logic. This set-up worked very well once I corrected the fault I had built in by inverting the logic signal! It is still working today.

About this time my son Andrew, who was just 14, asked for a CB radio. I have nothing against CB radio in principle but I said "No, but if you pass the RAE I will ensure that there is amateur equipment for you to use". This was the spur for me to get my licence and with the changed regulations I applied for and got G1JEG - there was no quibble even though the pass slip was dated more than 20 years previous.

I bought a Trio 9130 and taught Andrew for the RAE as there wasn't enough demand for the class at a local night school. That was a pity as I discovered later that **Tom G4MVN** was in fact an excellent teacher. Andrew passed the RAE and became G1MMY so, as a teacher, I have 100% pass rate at the RAE.

I then bought a Trio 2500 hand-held. Both these rigs have worked well over the years. Andrew isn't active anymore but may take the hobby up again in the future, at least he has his callsign. He has become an expert in computing and used the Internet a lot for communicating.

I decided that I wanted an 'A' licence so I set about learning Morse. It took me about 20 months to get up to 12wpm. I was greatly helped by the slow Morse transmissions of the RSGB and I also wrote a Morse generating program for the Sinclair Spectrum.

I was very proud of the program because, as well as churning out random letters and numbers, it would send random sentences. Even I, as the programmer, couldn't easily guess what was coming.

I was one of the last to take the Morse test at North Foreland before the RSGB took them over. I became G0EQM and bought a second hand Kenwood TS-440S.

About this time my boating activity increased greatly as my father retired and said that he was going to make model boats as a hobby and he wanted me to make the radios. We've done this with half a dozen models over the last ten years.

It was around this time that amateurs were given 50MHz and surface modellers (i.e. not planes) were given the top half of 40MHz. The channels were specified at 10kHz apart, there being about 30 of them. (Any modeller can still use the 27MHz band as before whereas a few years earlier planes had been given 35MHz).

The Navigator

A very good system called the Navigator was developed under the auspices of *Marine Modelling* magazine and quite a lot are now in use. Most people buy them ready made, but kits are available. I bought a kit for the r.f. part of the transmitter and the receiver and made my own logic. It is a very good set and I have made three altogether.

The most complex boat we have, which is having a refit at present, is a fire tender in which everything works: rudder; two engines; bowthruster; lights; anchor; lifeboat; hoses; etc. Again, some of the logic is unique, some of the switching signals are carried in the sync pulse thus not wasting a channel. I haven't offered it for publication because it is relatively complex and I am the only boat modeller I know who makes his electronics.

One of my boats I call the 'floating box' (which describes it pretty accurately). My father was a bit ashamed of it and made a superstructure to make it look a bit better (which it does). This boat had a lot of room inside and the whole deck came off which allowed me space to develop new circuits. My speed controllers which are fully proportional in both directions but have no relays were tested in this before they were put in the good looking boats.

Latest Project

My latest project is to try and get a system working on 459MHz which is a band we're allowed but which very few people use. The advantage of this being that I could work at anytime as no one would be on my frequency.

The techniques must be the same as for 430MHz and I have looked at some circuits from the *Radiocommunication Handbook*, so far without success. I've had great help in this project from Keith G8HTM and one day it will work.

So, there you are, a brief outline of what I have done in the world of radio. Not a lot to do specifically with Amateur Radio, but I do use a lot of radio techniques and have many amateur friends. Happy soldering! *PW*

LOOKING AT... IF Filters

This time around Gordon King G4VFV brings you the seventh in his 'Looking At' series. This month he looks at i.f. filters and the part they play in Amateur Radio.

How well a receiver responds to a wanted signal whilst rejecting unwanted adjacent signals, even though these may be stronger, depends upon the quality of the selectivity engineered into the intermediate frequency (i.f.) channel. The type and number of tuned circuits, or filters, adopted in the design have a direct bearing on the selectivity characteristics and hence the off-frequency rejection attributes.

With an i.f. around 470kHz for amplitude modulation, such amplifiers are perfectly capable of satisfying the selectivity requirements of broadcast receivers. Communications receivers, however, generally aim to improve upon this basic requirement by incorporating two i.f. sections, one tuned to a higher frequency than the other.

The lower the i.f., the tighter the selectivity characteristic for a given number of tuned circuits, but a low i.f. places the image response undesirably close to the tuned frequency. This is effectively counteracted by the higher frequency i.f. section. Four 85kHz tuned circuits, for instance, provide significantly better selectivity than four 470kHz tuned circuits.

Bandwidth Requirements

The minimum bandwidth required is determined by the sidebands of the transmission. The c.w. mode (A1A) can be handled within the smallest bandwidth of all modes, filters of 500Hz or less allowing passage of all the c.w. information.

Single sideband (s.s.b.) signals require about 3kHz, while double sideband (d.s.b) signals call for double this bandwidth, at around 6kHz. Frequency modulation (f.m.). signals, on the other hand, call for a greater bandwidth than a.m. signals, depending upon the deviation.

Narrow band f.m. (n.b.f.m.) with ± 6kHz deviation requires about 12kHz for communication quality speech, while wide band f.m. (w.b.f.m.), as used for broadcast quality audio with ± 75kHz deviation, requires around 200kHz. The bandwidth is usually taken as being between the -3dB (half-power) points on the response curve.

Because the power of the thermal noise (hiss) produced by a receiver is proportional to bandwidth, noise power bandwidth (a bandwidth in excess of that required by the signal) - especially at high gain - is undesirable. This is one reason why a weak A1A signal focused into a narrow bandwidth is often less difficult to read than a speech signal of similar strength operating in a wider bandwidth.

With f.m., though, an improvement in the **information power** content occurs with increased deviation. This enhances the signal-to-noise ratio even though the wider operating bandwidth increases the thermal noise.

The Q-Factor

The higher the *Q*-factor (ratio of reactance to resistance) of the tuned circuits, the more desirable the selectivity characteristic becomes. In communications receivers, a high *Q*-factor is achieved by integrating quartz crystal resonators and mechanical filters into the design of the i.f. channel.

A quartz crystal can be likened to a tuned circuit containing inductance (L), capacitance (C) and resistance (R), but because R is very low, *Q*-factors ranging from 10 to 100k become possible, as compared with a mere 300 to 400k provided by i.f. transformers alone.

The diagram, **Fig. 1a**, shows the circuit of a filter in which a single quartz crystal is integrated with the i.f. transformer to provide variable selectivity. Curve A in **Fig. 1b** represents the response of the i.f. transformer alone, while curve B indicates how the basic response is improved by the action of the crystal.

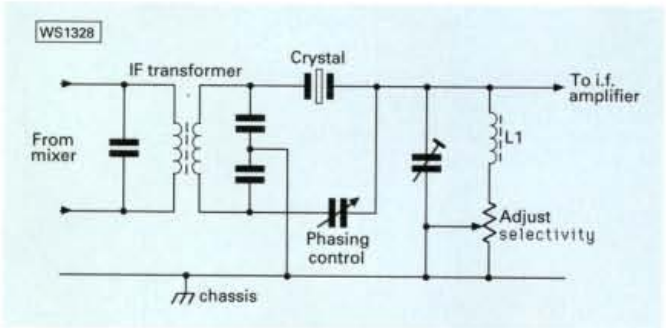
This occurs when the i.f. and the series resonance frequency of the crystal coincide. Stray capacitances are balanced out by the phasing control, the response then becoming reasonably symmetrical, as shown at the bottom left of curve B.

The phasing control also alters the slope of the side-skirt, producing a sharp, 'anti-resonance' null at one side of the response at a frequency related to its setting, as shown by curve C. This is useful for notching out an interfering signal which may be present within the passband. The variable resistor **reduces** the selectivity characteristic as it is turned in the direction which **increases** the value of resistance appearing in series with L1.

The circuit of a filter using two crystals, also arranged in conjunction with the i.f. transformer, is shown in **Fig. 2a**. This, known as a half-lattice filter, yields a response characteristic with a superior form factor and with less tendency to ringing than the single crystal circuit.

Instead of the third winding on the transformer as shown, the circuit may be based upon a transformer with just the two primary and secondary windings, along with a centre-earthed pair of capacitors, corresponding to C1 and C2 in the single crystal circuit.

The response curve in **Fig. 2b** shows that crystals X1 and X2 provide the left and right-hand



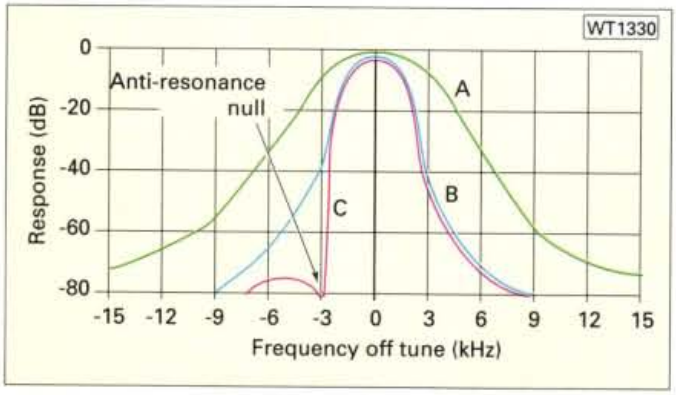


Fig. 1a & b. This single crystal filter circuit (a) includes phasing and selectivity controls, giving the response characteristics as at (b).

side skirts respectively. The half-power bandwidth of this circuit approximates 1.5 times the difference between the frequencies of the two crystals.

Selectivity Enhancement

Selectivity characteristic enhancement may be possible by incorporating a trimmer capacitor across the higher frequency crystal for capacitance balancing. Resistor R1 is chosen to provide the flattest response.

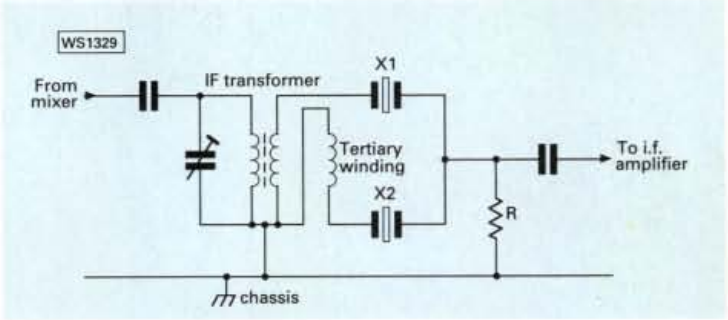
Steeper side skirts become possible by using two half-lattice filters in cascade, or multiple ladder filters, but if the sides are too steep this can attenuate the higher frequency sidebands and impair the sound quality. Even so, on balance it is often less fatiguing to suffer slight impairment to audio quality than persistent adjacent frequency interference (QRM)!

The crystal of a filter (or oscillator) acts as mechanical resonator. It is made either of natural quartz or of specially synthesised ceramic, as are most latter-day crystals.

A crystal of synthetic quartz is grown from seeds of natural quartz which is then sliced and ground to provide the required characteristics and resonant frequency. Such crystals operate by virtue of their piezo-electric effect - vibrating accurately, thereby controlling an applied oscillatory signal or, conversely, yielding an electric output when stressed or vibrated.

Similar control is provided by mechanical filters, which tend to supersede crystal filters where the i.f. lies between around 60 and 600kHz. This kind of filter uses disc resonators between input and output transducers.

The i.f. signal applied to the input transducer is converted to mechanical energy at the disc, thereby accurately controlling the frequency and then converted back to signal again by the output transducer.



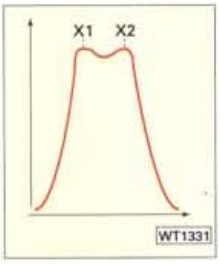


Fig. 2a & b. Based on two crystals, this half-lattice filter circuit (a) provides a symmetrical response of good form-factor with a half-power bandwidth approximating 1.5 times the difference between the two crystal frequencies (b).

Selectivity can also be sharpened and sensitivity enhanced by controlled positive feedback in an i.f. amplifier. This is rather like the 'reaction' circuit used in the detector stage of early tuned radio frequency (t.r.f.) receivers, but with the feedback (from output to input) controlled to a point prior to the onset of oscillation. This scheme is called *Q*-multiplication.

That's all for this instalment of 'Looking At'. Please send any comments to me, Gordon King G4VFV, c/o *Practical Wireless*, PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. *PW*

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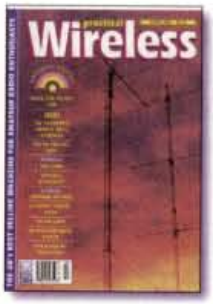

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Daily admission prices are the same as last year: **£3 for adults, £2.50 for Senior Citizens** (OAP) and **children under the age of 14**. Entry is **FREE to children under the age of 5**!

Opening times will be the same as usual - **1000-1700 both days** and further information will be available on the Radiosport Web site: **www.radiosport.co.uk** As readers probably realise, both *Practical Wireless* and its sister magazine – *Short Wave Magazine* – will be there. WE HAVE MOVED TO the **Red Hall** on **Stand O** .

Never a dull moment with the *PW* Rally Team. Why not come along to the stand and help keep Rob quiet!
Pictured (left to right): (back row) Peter Eldrett; Tex Swann G1TEX; Roger Hall G4TNT; Chris Staadman; Joanna Williams and Rob Mannion G3XFD (front).

Why not come along and meet the team – we always appreciate the chance to meet our readers and welcome any comments which you might have about the magazine - good or bad.

The *PW* Rally Team this year will include: **Roger Hall G4TNT** (Director in charge of Rallies); **Chris Steadman** and **Peter Eldrett**. From the Editorial department there will be: **Rob Mannion G3XFD (*PW* Editor), Tex Swann G1TEX (*PW* Technical Projects Sub Editor) and Joanna Williams (*PW* News & Production Editor)**. Please feel free to approach any member of the team with any query you might have.

If you have any technical queries then Tex G1TEX is the person to ask, if you wish to discuss any of the Editorial content of the magazine then Rob G3XFD, Tex G1TEX or Joanna will be pleased to help.

On the stand this year we will have a number of very special book offers as well as Subscription deals which are open only to people who visit our stand at the Picketts Lock show. (Please see **p.49**).

How To Get There

Readers will find detailed explanations of how to get to the Lee Valley Leisure Centre (Picketts Lock), Picketts Lock Lane, Edmonton, London on the Radiosport Web site at: **www.radiosport.co.uk** But, for those of you who don't have access to the Internet, here are the details of how to get there from the M25:

From **Junction 25** of the **M25** take the **A10 south-bound** (signposted Enfield and Central London). After 0.2 miles turn left at the traffic lights onto the **A105**. After 0.7 miles go straight on at the traffic junction with the A1010 – you will now be on the **A1055**.

Follow the road as it bends to the right and go straight on through **five sets of traffic lights, three roundabouts** and **one further set of traffic lights**. Lee Valley Leisure Centre is on your left-hand side.

If you're planning on using public transport to get you to the London Amateur Radio & Computer Show this year then you can take the train from **Liverpool Street Station** (in the City of London) to **Edmonton Green**.

(Note: Liverpool Street is also the terminus for the **frequent shuttle service to/from Stansted Airport** which is served by air routes from Europe and is particularly useful for visitors from Ireland).

Turn left as you exit Edmonton Green station and cross the road under the railway bridge. Turn left and make your way to bus stop E and catch the W8 bus which stops at the Lee Valley Leisure Centre.

If you have any further queries regarding anything to do with the London Amateur Radio & Computer Show then please contact Radiosport direct on **Tel: (01923) 893929, FAX: (01923) 678770, 126 Mount Pleasant Lane, Bricket Wood, Herts AL2 3XD or visit the Radiosport Web site: www.radiosport.co.uk**

PICKETTS LOCK SHOW SPECIALS*

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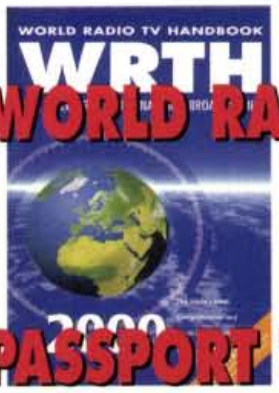
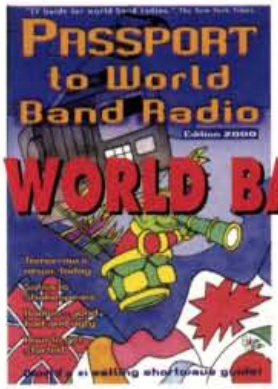


WORLD RADIO TELEVISION HANDBOOK 2000

was £19.95 **ONLY £17.00**



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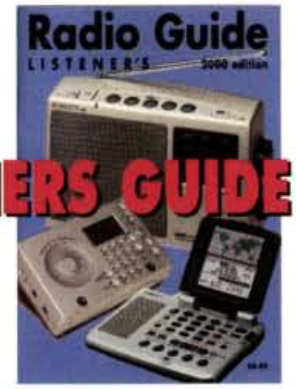
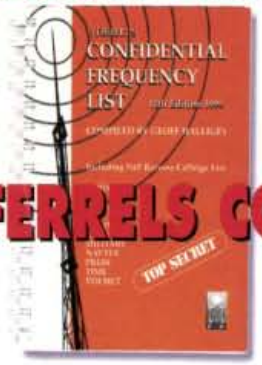
was £19.50 **ONLY £17.00**



RADIO LISTENERS GUIDE 2000



was £4.95 **ONLY £4.00**

FERRELS CONFIDENTIAL FREQUENCY LIST

was £19.95 **ONLY £12.00**

SUBS OFFER

PW	**£28 UK** **£35 EUROPE**	**14 issues for the price of 12**
SWM	**£33 UK** **£40 EUROPE**	**14 issues for the price of 12**
JOINT SUB	**£55 UK** **£68 EUROPE**	**14 issues for the price of 12**

*BOOK AND SUBSCRIPTION OFFERS ONLY APPLY AT THE PICKETTS LOCK SHOW

London Amateur

11th & 12th March 2000, Lee Valley Leisure Centr

London Show Lectures

Saturday 11th March 1200

'100 Years of Amateur Radio' by Ian Poole G3YWX

The first Amateur Radio station was set up in 1898 at Woolwich Arsenal and since then Amateur Radio has changed beyond all recognition. This talk by *PW*'s regular 'What Is A'? author, **Ian Poole G3YWX**, tells the exciting story of how Amateur Radio has developed from the time when the first station was set up to the present day, recalling achievements during the early days as well as those that are taking place today.

There will be many photos from the new RSGB book *Amateur Radio - 'The First 100 Years*, as well as many other interesting dates and facts.

Saturday 11th March 1400

'Windows 2000' by Bob Fuller G6PWS

Come and hear what Microsoft's latest operating system has to offer the computer user. **Bob Fuller G6PWS'** talk will be illustrated and will cover the evolution of Windows. It will also take an in-depth look at the facilities offered by the latest version from the Microsoft camp.

Sunday 12th March 1200

'Internet Linking Forum' by the RSGB Datacommunications Committee (DCC)

Without a doubt the hot topic of the moment is the linking of Amateur Radio to the Internet. This forum will give interested parties the opportunity to acquaint themselves with which kind of links will be possible to establish and how. It will be chaired by the DCC Chairman, **Iain Philipps G0RDI**, and attended by other members of the committee.

Sunday 12th March 1400

***'Practical Wireless* - Into the Future' by Rob Mannion G3XFD**

Come and hear our very own Editor, **Rob Mannion G3XFD**, talk about the Editorial approach of the magazine and give a round-up of his 'Radio Basics' column. The talk will conclude with a question and answers session and he'll then be joined by **Tex Swann G1TEX**, so if there's something you've been meaning to say or a question you've wanted to ask, this would be an ideal time and place to do it.

Dealers List

Agile Tools
Air Training Corps
AJP Communications
AKD
Aktiv Direct
Alsco Trading
Arcade Shop
ATM
Audio Exchange
Barrett R
BATC
Baylin Publications
Bill MacDonald Ltd
Bitwave Computer Systems
Brent Computers
Bring & Buy
British Citizen Band
CD Plus Distribution Ltd
Cheshunt & District ARC
Cirkit Distribution Ltd
Clifton ARC
Comms PMR
Computer Junk Shop
Digital Installations
Dorling Kindersley Family Learning
Dosher, J
DVD Mail
Fisher Products
Fleetwood Communication
Gemini Electronics
Guide Dogs For The Blind
HARP Shareware
Havanhand
Haydon Communications
Haynes
Hoddesdon Radio Club
Holderness, Robin
Icom UK Ltd
Inktec Midlands
IPAC
J & M Computers
Kenwood Electronics
LDC
Len Cooke Enterprises
Linear Amp UK
Loutronics
Marcom
Martin Lynch & Sons
Microware
Mikay Distributors
Mirage Designs
Moonraker UK Ltd
Nevada
No Nuts
Office 21
Optical Illusions
Pivot Computer Systems
Practical Wireless/Short Wave Magazine
Proline
QRP Component Company
Quality Inks
R @ D Instru-met Ltd
Radio Active Magazine
Radio Bygones
Radiocommunications Agency
Radio Today
RAIBC
Raynet North London
Remote Imaging Group
Rich Electronics
Rigs Of Distinction
RNARS
Ronal Computers Ltd
RSARS
Sandpiper
SGS
SMA (UK) Ltd
SMC
Southern Aerial Services

Radio Show 2000

e, Picketts Lock Lane, Edmonton, London N9 0AS

SRP Trading
Strikalite
Sudbury Electronics
Sweet Box
Sycom
Tango, Echo DX Group
Taurus
TEC Plus
Three R Global Enterprise
Timestep Electronics
TK Electronics
TLX Electrical Ltd
Tracktek Systems Ltd
Transworld Satellite
UBM
Waters &Stanton
W H Westlake Electronics
Yaesu UK Ltd

... and many others. List correct at time of going to press. A full list of exhibitors will be displayed in each hall at the exhibition.

BLUE HALL

11th London AMATEUR RADIO & COMPUTER SHOW

Floor Plan & Dealers List

London Show News

Compiled by Joanna Williams

Yes, it's that time of year again and the **London Amateur Radio & Computer Show** at Picketts Lock is upon us once again! This year there appears to be quite a lot going on over the weekend of the **11th and 12th March 2000** and with it being the first 'big' Amateur Radio show of the new century, some dealers and manufacturers have 'big' plans.

On these pages the Editorial team here at *Practical Wireless* have compiled a condensed news section on what readers can expect to find on some of the stands this year.

AKD can be found in the Red Hall on Stand R

Valerie Wagstaffe at **AKD** has been in touch with *Practical Wireless* to tell us that they are moving from their usual position in the Blue Hall, to the Red Hall, Stand R at this year's Picketts Lock.

Visitors can expect to see a number of things on the AKD stand this March, Valerie tells us. Firstly, the **new Target HF Antenna** will be on display for the first time. This high performance h.f. active antenna comes complete with a power coupling unit, power cable and 7m of coaxial cable.

The Target antenna covers the 30kHz-30MHz frequency ranges and has a power consumption of 20mA @ 12V. The overall length of this new antenna is 400mm and it is robust and waterproof Valerie states. It is recommended that this antenna be used with the Target range of receivers.

Also on display, Valerie says, will be the **Target HF3S receiver** (see picture). This receiver comes complete with software, data lead, p.s.u. and long-wire antenna.

As would probably be expected, the range of **AKD transceivers** will also be on show on the stand at Picketts Lock this year. The **2001 144MHz transceiver** with 12.5kHz spacing will be on show as will the **6001 50MHz transceiver** with CTCSS tones for repeater access.

The **AKD 4001 70MHz transceiver** (as featured in our 4m article in the January 2000 *PW*) will be on the stand along with the **7003 430MHz transceiver**. To top it off, AKD will have a range of TVI filters, filter kits, toroid rings, etc. for visitors to choose from.

So, why not visit the AKD stand this year? Further details can be obtained from AKD on **Tel: (01438) 351710, FAX: (01438) 357591, Unit 5, Parsons Green Estate, Boulton Road, Stevenage, Herts SG1 4QG.**

Continued on page 52...

London Amateur

11th & 12th March 2000, Lee Valley Leisure Centr

London Show News

Compiled by Joanna Williams

...continued from page 51

Haydon Communications can be found in the Blue Hall on Stand Z

Mike Haydon at **Haydon Communications** has contacted *PW* with news of the new range of weather clocks from **Oregon Scientific** which they have recently taken on. Mike says that this range of clocks represent "good value for money" with some of the radio controlled clocks starting from as little as £15.

The BAR-888U comes with a free remote sensor when you buy from Haydon Communications.

Depending on whether you want an accurate indication of the time, received by radio from Rugby (on the radio controlled versions) or whether you'd like an indication of weather trends and barometric pressure, then Oregon Scientific will have something for you, Mike says.

All the clocks and weather monitors are supplied "ready to go" out of the box and come with batteries, Mike states and where the weather monitor is concerned, this unit is sold with one free remote sensor, although optional sensors are available (see picture of the **BAR-888U**) - up to three remote sensors can be connected, all of which are waterproof and can be used outside.

Some of the clocks which will appear on the Haydon Communications stand are pictured here and include: the **RM-318P**; the **RM-338**, the **RM-913TC**; the **BA-312** and the **JM-838WF**. All of these products will be on show and for sale at the Picketts Lock Show this year.

For further information on these clocks or to find out what else Haydon might have on their stand, please contact them direct on **Tel: (01708) 862524, FAX: (01708) 868441, Unit 1, Thurrock Commercial Park, Purfleet Industrial Estate, London Road, Aveley, Essex RM15 4YA.**

Icom UK Ltd can be found in the Red Hall on Stand S

Ian Lockyer at **Icom UK Ltd** has told *PW* that Icom will once again be at the London Show this March. At the time of going to press, Ian couldn't give me any firm details on what visitors can expect to find on their stand - Icom UK seem to be playing their cards close to their chest on this issue!

However, Ian did tell me that the **IC-756PRO** will be on show, so for all of you who haven't had a chance to have a look at this h.f. plus 50MHz 32bit DSP transceiver (released September 1999), perhaps the Picketts Lock show this March could be your chance.

If the stand at this year's London Show is anything like the one they had at the 1999 Leicester Show then you will be able to try the equipment out and there will be plenty of people on hand to answer any queries you might have.

For further information, please contact Icom direct on **Tel: (01227) 741741, FAX: (01227) 741742, Sea Street, Herne Bay, Kent CT6 8LD.**

Kenwood can be found in the Red Hall on Stand N

Dave Wilkins G5HY at **Kenwood** has told *PW* that Kenwood will once again be attending the London Show this March. Although he cannot give any firm details of what else will be on the stand, Dave does say that the new Kenwood **TM-D700E mobile transceiver** will be on show.

This mobile transceiver makes the most of SSTV, GPS and APRS and has a built-in TNC. Kenwood say that the TM-D700E "offers a wide range of data communications options, including simple Packet operation using the AX.25 protocol".

The TM-D700E is a full dual-band mobile and comes with many features: 9600bps PC-based Packet communications for chat - with simplified Packet monitoring; GPS input terminal; SSTV functions with Fast f.m. for transmission of images in just 14 seconds, according to the press release, as well as dual receive for voice & image transmissions.

For details of the TM-D700E or to find out what else they might be demonstrating at the London Show in March please contact Kenwood direct on **Tel: (01923) 816444, Kenwood House, Dwight Road, Watford, Herts WD1 8EB.**

Linear Amp UK can be found in the Blue Hall on Stand V

Linear Amp UK will once again be exhibiting at the London Amateur Radio & Computer Show this March and can be found in the **Blue Hall** on **Stand V**. No doubt they will have numerous products on the stand and *PW* know for sure that they will be happy to help readers with any questions which they might have.

If you would like to know exactly what Linear Amp UK will have on offer at the show this year please contact them direct on **Tel/FAX: (01964) 550921 Field Head, Leconfield Road, Leconfield, Beverley, East Yorkshire HU17 7LU.**

Martin Lynch & Sons can be found in the Red Hall on Stand T

Martin Lynch of **Martin Lynch & Sons (ML&S)** has been in touch with *Practical Wireless* to tell us all about their stand at this year's March London Amateur Radio & Computer Rally. He says that they will have their "usual array of New and Used products on display from their London showroom".

The new **Icom IC-756PRO** will "take pride of place on the stand". As well as this, Martin Lynch tells *PW* that the "new Kenwood TM-D700E will also be on show".

Martin and his team will also be showing off their **new Web site** which, he says, is the only "'on-line' shopping 'Ham' site in the UK". Visitors to the new site can view any make or model of transceiver held in stock by Martin Lynch & Sons, click on its specification (which, Martin states, is most of the colour brochure in most cases), see the price and click on order - Martin tells us that he has moved his whole site to a secure server in order to make it safe to use credit card information.

So, why not visit the ML&S stand this March and take a look at what they have to offer the Radio Amateur of the 21st Century? If you want to see the site for yourself before the show then take a look at: **http://www.MlandS.co.uk**

For further information about the ML&S stand please contact them direct on **Tel: 0208-566 1120, FAX: 0208-566 1207, 140-142 Northfield Avenue, Ealing, London W13 9SB.**

Nevada can be found in the Red Hall

Nevada have told *Practical Wireless* that they will, as usual, be attending the London Amateur Radio & Computer Show this March and can be found on their usual stand in the Red Hall. They say that they will have all the usual equipment on show including all the latest rigs from **Alinco** and **SGC**.

You may remember, at the Leicester Show in September 1999, Nevada's newest addition was the **ZX Yagi** range. Well, the owner of ZX antennas will once again be on the Nevada stand along with a selection of his range of antennas.

For more information about what Nevada will have on their stand this year, please contact them

Radio Show News

e, Picketts Lock Lane, Edmonton, London N9 0AS

direct on **Tel: 0239-266 2145, Unit 1 Fitzherbert Spur, Farlington, Portsmouth PO6 1TT.**

The QRP Component Company can be found in the Red Hall

Chris G3TUX of the **QRP Component Company** has been in touch to tell *PW* that the company can be found in the Red hall "alongside Martin Lynch" at the show in March and will be "offering its usual bill of fare".

Firstly, the QRP Component Company will have numerous kits from **CM Howes** - including some "discontinued Howes kits", which may "enable home constructors to finish off the odd project". Also there will be some **Ten-Tec** kits on show as well as the "final offering" of **Wood & Douglas** v.h.f. kits will be made according to Chris.

Along with their "extensive" range of keys and paddles from "leading manufacturers", the **new Kent twin key** (available exclusively from The QRP Component Company) will be shown on the stand for the first time. This new Kent twin key consists of a twin lever paddle and a pump key, mounted on a single base. (Although not a new idea, it offers the opportunity to position the pump key to the right or left of the paddle mechanism depending on individual preferences).

Finally, the range of TiCK keyer chips and kits will be on display along with other used equipment and specialised components associated with QRP. For more information why not contact The QRP Component Company direct on **Tel: (01428) 661501, FAX: (01428) 661794, PO Box 88, Haslemere, Surrey GU27 2RF**.

SMC can be found in the Red Hall on Stand U

Geoff Brown, Retail Manager of **South Midlands Communications (SMC)** has been in touch with *PW* and tells us that they will, once again, be appearing at the London Amateur Radio & Computer Show in March. He says that they will be clearing some of the old stock from both the Amateur and Commercial stores.

Some items which will be shown on the stand this year include the last few 70MHz mobile PMR sets, already set up for simplex operation, more of the u.h.f. FT-73 look-a-likes at £50 each (which includes NiCads) and many more PMR sets at silly prices.

Also on the SMC stand this year will be a large range of beams/verticals and other types of antennas, including new mobile ones and ones for h.f. and u.h.f. at just £5 each, Geoff states. "One very special deal" He tells *PW* about is the commercial dipole antenna which, although 30m long, covers the h.f. spectrum with good v.s.w.r. and the price will be just **£30 each** at the show.

Geoff tells us that SMC will also be "offering the full range from Icom and Yaesu at really silly prices". So, why not take a peek at the SMC stand this year. For more details, please contact SMC direct on **Tel: 0239-024 6222, SM House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO53 4BY**.

SRP Radio Centre (SRP Trading) can be found in the Red Hall

Stewart Plested of **SRP Radio Centre (SRP Trading)** is celebrating 24 years in communications this year and is looking optimistically to the future. Dave, Mary and Stuart say that they look forward to seeing everyone again in the Red Hall.

They tell *PW* that they will be taking a large range of CB, scanning, short wave and amateur radios to the show this year as well as accessories and lots more besides. They also say that they will have all sorts of communications bargains. "Feel free to stop by for a chat and we will be happy to answer any questions you might have", Stewart says.

For more information, please contact SRP Radio Centre direct on **Tel: 0121-460 1581, Rednal, Birmingham, B45 9TZ.**

Sycom can be found in the Red Hall on Stand B

Robin Sykes of **Sycom** FAXed *PW* to tell us all about their plans for the show this March. He tells us that they will be on the usual stand at that they will be having a component clearance with components at low prices.

Also Sycom will have the German representative of **Funktechnik fibreglass masts and antennas** on their stand this year with some of their products. So, why not pay a visit to the Sycom stand this year? For further details please contact Sycom on **Tel: (01372) 372587, FAX: (01372) 361421, PO Box 148, Leatherhead, Surrey KT22 9YW**.

Waters & Stanton PLC can be found in the Blue Hall

Jeff Stanton of **Waters & Stanton PLC** has written to *PW* to tell us that they will have their "usual full display in the Blue Hall at Picketts Lock which has now grown to be the biggest stand", Jeff states. They will also have their new colour catalogue on sale - they will have all the usual products from "**ADI** through to **Watson**".

There will be a number of new items which will be of particular interest to readers including the high spec., low priced power meters from **Avair**, the new **Street Pilot GPS Unit** from **Garmin**, a full range of **Heil** quality head sets and microphones as well as the new full specification **Icom IC-756PRO** transceiver.

In addition to all of the above, Jeff tells us that they also expect to have "new products to on show from **ADI, Alinco, Cushcraft, Kenwood, MFJ, Optoelectronics** and **Watson**". For more information please contact Waters & Stanton on **Tel: (01702) 206835, FAX: (01702) 205843, Spa House, 22 Main Rd, Hockley, Essex SS5 4QS**.

W H Westlake Electronics can be found in the Red Hall on Stand M

Henry G8MWW FAXed us to let us know that they will be attending the London Amateur Radio & Computer Show this year with an extensive line of connectors and cables especially for the Amateur Radio market as well as many types which are available only from them.

Henry also says that they will once again be offering special prices on cut rolls of coaxial cables and antenna wires. There will also be additional useful lines which everyone needs, he says, such as solder in many sizes, useful tools and tool kits and many expanding lines in the hobbyist and DIY fields.

For more information please contact W H Westlake Electronics direct on **Tel: (01409) 253758, FAX: (01409) 253458, West Park, Clawton, Holsworthy, Devon EX22 6QN**.

Yaesu UK Ltd can be seen as you walk through the main entrance

Yaesu UK Ltd have contacted *PW* to let us know that they will definitely be at Picketts Lock this year and you'll not be able to miss them because, as well as the usual stand this year **they will also have the FT-100, ATAS-100 and FT-90R mobile transceivers fitted into the Yaesu car on the stand!**

Yaesu's usual stand will feature their new **ground to air hand-held air band transceiver** - the **VXA-100** as well as their whole range of amateur equipment. They will also have mugs, key rings and coasters for sale - all the proceeds of which will go to Leukaemia research!

Yaesu also tell *PW* to remind readers not to forget to enter their **free prize draw** to win a **VX-1R** miniature hand-held transceiver or an **MD-100A8X** desk microphone. (All entrants must have a current callsign and be present to collect their prize).

For more details, please contact Yaesu on **Tel: (01962) 866667, FAX: (01962) 856801, Unit 12 Sun Valley Business Park, Winnall Trading Estate, Winchester SO23 0LB**.

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YAESU FT100	MOBILE HF - NEW BOXED	1259.00	999
YAESU FT90	DUAL BAND MOBILE - NEW BOXED	399.00	CALL
YAESU VX1R	DUAL BAND HANDHELD - NEW BOXED	229.00	169.00
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ICOM IC-2800H	2M/70CM MOBILE TX - 1 ONLY - NEW BOXED	499.99	449.00
KENWOOD TM-G707	2M/70CM MOBILE TX - 3 ONLY - NEW BOXED	349.95	299.00
KENWOOD TH-D7E	2M/70CM HANDI + PKT TNC - 2 ONLY - NEW BOXED	319.99	259.00
KENWOOD VC-H1	COLOUR SSTV IMAGING UNIT - 3 ONLY - NEW BOXED	399.95	249.00
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ALINCO DJ-K10E	WIDEBAND MULTIMODE SCANNER, DISPLAY MODEL	295.00	225.00
ALINCO DJ-191E	2M HANDIE - EX DEMO	169.00	119.00
ALINCO DR-605E	2M/70CM MOBILE - EX DEMO	329.00	269.00
ALINCO DX-77E	100W BASE - 1 ONLY - EX DEMO	599.00	499.00
ALINCO VC-6	GREAT 6M ANTENNA, 'V' DIPOLE - WORKS WELL	75.00	39.00
CABLE - TWIN FEEDER	TOP QUALITY 450 OHM FEEDER (PRICE PER METRE)	0.85	0.80
CUSHCRAFT 22XB	70CMS OSCAR - 22 ELE. 14.3FT BOOM. S/STEEL H/WARE	229.95	199.00
CUSHCRAFT 738XB	70CM OSCAR 38 EL 14.3FT BOOM INC POLARITY SWITCHER	209.95	175.00
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DIAMOND D707	ACTIVE SCANNER ANT, BUILT-IN AMP @ 5 - 1500MHZ)	129.00	99.00
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EARTALKER CT221	INVISIBLE MIC - FITS YAESU, ICOM ETC - SPECIAL PRICE	29.95	25.00
HIMOUND MORSE KEY	HK703 - GREAT STARTER - JUST PUT ON A NICE BASE!	29.95	25.00
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KENWOOD PG4K	4M BOOT MOUNTING KIT SUITS TM732E	42.95	30.00
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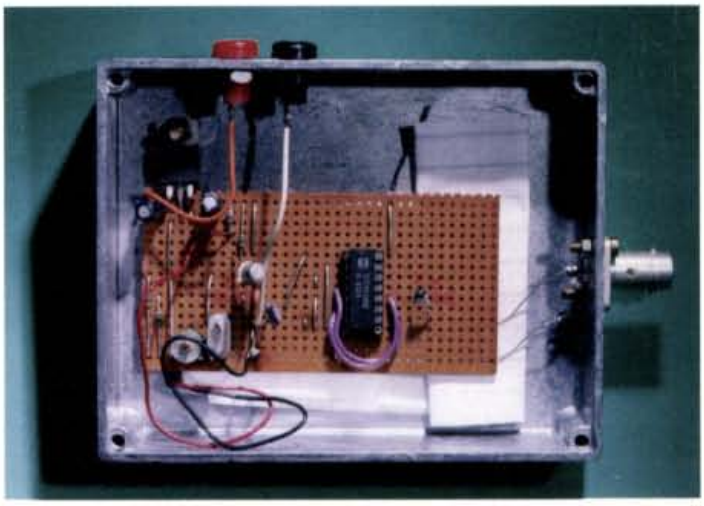
A High Frequency Comb Generator



Geoff Theasby G8BMI's very own High Frequency Comb Generator.

Geoff Theasby G8BMI describes a very useful item of test equipment - which, as well as making itself useful in your workshop, will also provide useful experience in i.c. logic techniques.

Readers will no doubt be familiar with frequency markers, using a 1MHz crystal and a series of divider integrated circuits (i.c.s) to obtain frequencies down to 1kHz or less and harmonics of 1MHz. However, whilst these are useful they don't extend up into the v.h.f./u.h.f. spectrum too far before they become too faint to pick up.

To get over the problem, my article describes a small circuit which, in effect, "goes the other way". It generates harmonics of 1MHz for hundreds of megahertz. The appearance on a spectrum analyser is of a hair 'comb' (having lots of teeth) hence the name.

The Circuit

Let's now look at the techniques behind the circuit. When a signal is applied to a gate of an i.c., there's a very small, but definite, delay until an output is obtained. This is called the 'Propagation delay' and the diagram, **Fig. 1**, shows the basic layout of the circuit which takes advantage of this effect.

The integrated circuit (i.c.) IC1 has four 2-input Exclusive-OR gates. Each gate works in the following fashion - with one input, an output is produced, with two inputs, no output results. When a signal is input to IC1a, it turns on and an output is produced which is passed to IC1c, which also turns on.

Meanwhile, IC1a output is also used to turn on IC1b, the output of which is applied to the other input of IC1c, which turns it off. Because of the propagation delay in IC1b, the effect is that IC1c turns on, then off, very quickly. (The delay is also present in IC1a and 1c, of course, but is of no consequence).

Important note: IC1d is a spare and is not used. However, it's good practice to return unused pins all to 5V, or all to ground, via "pull up" or "pull down" resistors, of about 100kΩ.

If we use a 74AC86 for IC1, the delay is about five nanoseconds. This gives a very sharp, narrow pulse, which may not be visible on many oscilloscopes, but creates harmonics for hundreds of megahertz.

Colpitts Oscillator

In the original circuit I used a Colpitts oscillator at 1MHz. Any format crystal worked, but a miniature type was preferable. A 5MHz crystal could also be used (if the harmonics from a 1MHz are too close together for u.h.f. use). Alternatively two switched crystals could be used with an l.e.d. indicator providing an indication that the circuit is on.

The final circuit for the project is shown in **Fig. 2**. Here the oscillator is based around the BC109 transistor.

As the circuit only operates at a few megahertz, layout is not critical and could be built in 'ugly' style with components self-supported in the wiring. However, building it on a piece of Veroboard makes it easier to follow the circuit and allows the use of an i.c. socket for IC1, which is of C-MOS construction and therefore susceptible to the effect of static electricity.

It's safer to get the oscillator working and to check the i.c. wiring carefully before it is inserted. Static precautions must be followed when inserting the i.c. Work on an earthed mat or plate and don't handle the i.c. out of its container until about to insert it in the socket. Even then, try not to touch the pins.

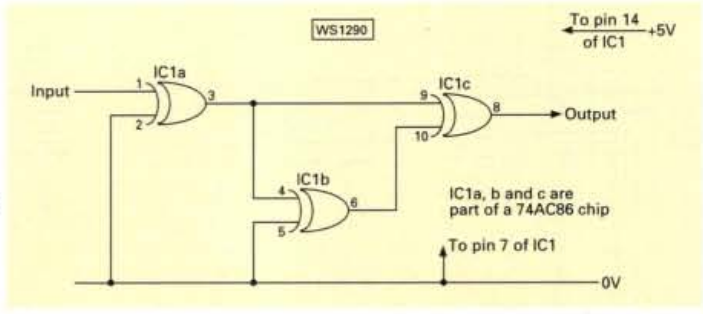
Pin Out Diagram

The pin-out details for IC1 is provided in the diagram, **Fig. 3**. For best results make sure that the wiring from the output of IC1c is short and direct, as losses here will reduce the high frequency output. The frequency can be set up accurately by tuning to a standard frequency transmission on 5 or 10MHz and adjusting the 30pF variable for zero beat.

Note: Don't worry if the main i.c., IC1, feels warm to the touch. This is quite normal for this device.

The power for the project is suitably regulated to 5V by IC2. An LM340T5 is a suitable regulator i.c. (The maximum voltage input can be up to 40V). This regulator will run hot if used for a few minutes at a

Fig. 1: When a signal is applied to a gate of an i.c., there's a very small, but definite, delay until an output is obtained. This is called the 'Propagation delay' and the diagram, shows the basic layout of the circuit which takes advantage of this effect.



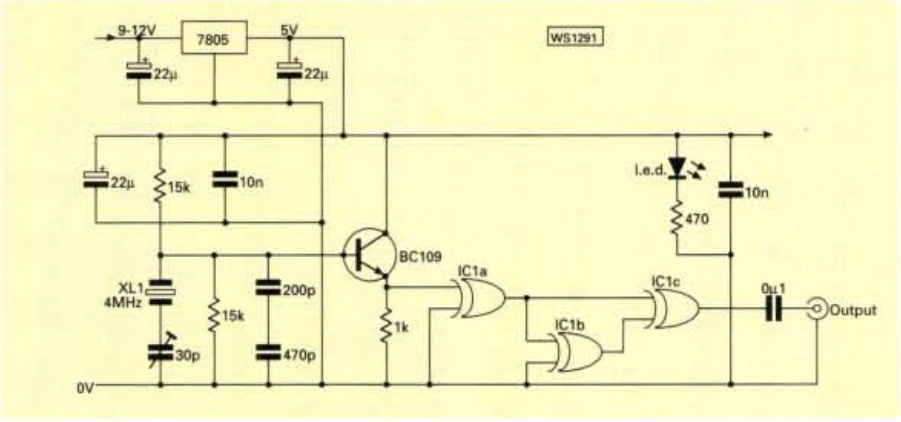


Fig. 2: Final circuit of the 'Comb Generator' project (see text for constructional details).

time, because the circuit draws about 150mA. A small heat-sink bolted on will help, or it could be bolted to the box.

If the circuit is built in a small die-cast or tinplate box, then an output socket should be fitted to enable the signal to be coupled to the receiver. It should be unnecessary to connect them directly, as just a short length of wire in the socket will allow the receiver to pick up sufficient signal.

If you connect the circuit directly to the receiving equipment (converter, etc.) you may need an attenuator in line. This will need to be reliable up to the frequency in use, to give good results.

As the output can have harmonies up to around 1GHz, the socket should have a similar cabapility, so an SO239 is not recommended. A BNC type is normally rated up to 4GHz so should be satisfactory for this application.

Usable Harmonics

The first version of this circuit, built some years ago, produced usable harmonics up to 2GHz. Originally, the transistor, Tr1 did not oscillate at all settings of the 30pF variable. Because of this I had to play around with the values of the 200pF capacitor at the base of the BC109 transistor. The values shown should work first time though!

A second version was built recently using a 4MHz crystal and this produced harmonics to over 2GHz. The harmonics peaked at 200MHz 15dB down and were substantially flat from 500MHz to 1800MHz at about 50dB down from the fundamental.

In the second example the voltage swing at IC1a input was not enough (it must swing from 5V to below 2.5V to switch the gate). I changed the 470pF capacitor in the base of the transistor to 220pF and that cured the problem.

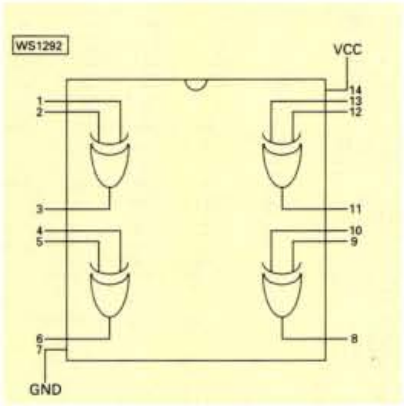


Fig. 3: Pin-out diagram of the 74AC86. Please note that IC1d is a spare and is not used (it's good practice to return unused pins all to 5V, or all to ground, via 'pull up' or 'pull down' resistors (see text).

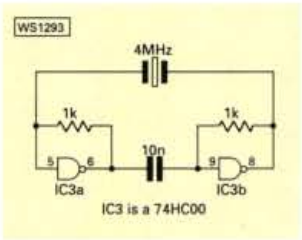


Fig. 4: A simpler type of oscillator, using an integrated circuit (see text).

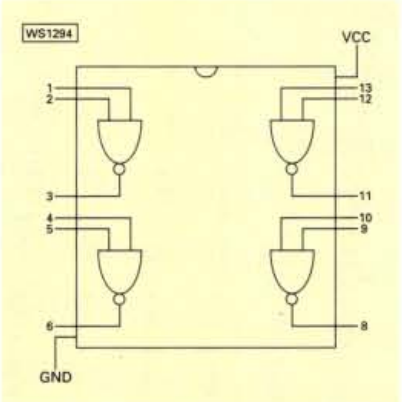


Fig. 5: Pin-out details of an alternative 'experimental' i.c. - the 74AC86 suggested by the author (see text).

Integrated Circuit Oscillator

I then made a third version using an i.c. oscillator instead of the BC107. This version, **Fig. 4**, is much simpler to build, and ensures a 5V swing and is taken from **Pat Hawker G3VA's** *Amateur Radio Techniques* (see Ref. 1 below).

The 74HC00 i.c. contains four 2-input NAND gates. Two of these are used in an oscillator configuration, such that the output from IC3b is fed back to the input of IC3a via the crystal to sustain an oscillation.

The recommended capacitor in Fig. 4 is 470nF for 1MHz. I found that 10nF worked for 4MHz. Again, you should handle the i.c. very carefully to avoid static damage and use a socket.

To test that the oscillator is working, listen for the fundamental frequency on a short wave receiver. You should also get 2.5V measured at pin 5 or pin 8, with a multi-range voltmeter. (This is because the gate is switched on for half the time and off for half the time, at the crystal frequency, so the average voltage is 2.5V. Of course if an oscilloscope is available testing will be easy!).

Very Useful

The project is very useful for checking v.h.f. and u.h.f. receivers and scanners. It's not modulated, so a b.f.o. will be required to produce an output which can be used to zero beat. It is also instructive project to help with the learning process in the operation of i.c.s.

Finally, as an interesting experiment, try replacing IC1 with a 74HC86 (pin-out details are shown in **Fig. 5**). This is a much slower-acting i.c. with an upper frequency limit of about 10MHz, instead of the 74AC86 which can go to over 100MHz.

The replacement i.c. will produce an output which drops off to nothing above 600MHz. So, if you try the experiment ... you'll see it's worth the extra expense for a 74AC86! PW

Ref: [1] *Amateur Radio Techniques*, 5th Edition, by G3VA. Published by the RSGB, p.175

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HRO receiver a.m. and f.m. signal generators/Heathkit 5inch oscilloscope, Marconi and AVO bridges, offers or will swap for good Astro telescope, will split the above. Tel: Warrington, Cheshire (01925) 659946.

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TS-140S, mint, box, manual, never used on transceive, swap TS-930SDR FT one but must be mint, 140S brought in error. Tel: Notts area 0115-930 8096.

Wanted: *Practical Wireless, Radio Constructor*, old radio books, fair price paid. Contact: John Savage, 13 Kemerton Walk Park, South Swindon, Wilts SW3 2EA.

Yaesu FT-220 2m (144MHz) transceiver/receiver. Yaesu FT-620B 6m (50MHz) transceiver/receiver. Yaesu FT-V101 transverters for 2, 6 and 4m (144, 40 and 70MHz). YO101 monitorscope**??**, please ring with price and condition. Non-working OK. Tel: Pete on Bristol (01454) 882465.

Yaesu FT-225RO tired or scrap for spares. Tel: Geoff G4DED (QTHR) (07931) 528269.

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antennas in action

welcome to AiA!

Hello and welcome to the March 2000 'Tex Topics' column. As I have little room in this issue I've decided to give over all the space to your letters, comments and help requests. As a consequence, I don't have any books for you this month.

Help Calls

I've had two calls for help over the holiday period. "Can you help"? was the question that arrived by E-mail from **Peter M1DGQ** when he asked "I wonder if someone has a similar antenna and can supply me with a part to complete an MFJ-1798 multi-band antenna that I bought early last year? There was a piece missing (shown in **Fig. 1**) from the new antenna as supplied. I've contacted the supplier several times, but in spite of their promises to help, they have been unable to supply the missing part."

Peter went on to say, "I've also contacted MFJ directly and have not had a reply about the missing part from them either. The drawing shows this missing part. It's around 50mm long and about a 6mm diameter could one of the readers help in my small dilemma?" I wonder if there's someone who can help Peter to get his antenna into fully working order. If you are able to help, Peter's E-mail address is: **peterm1dgq@foxbot.freeserve.co.uk** or, for those of you without E-mail access, please write either direct or via the office address.

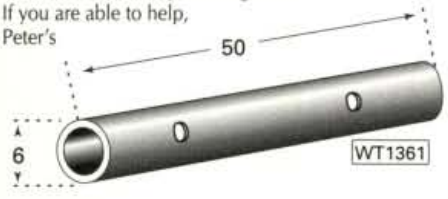


Fig. 1: Peter M1DGQ is looking for a joiner like this to complete his MFJ antenna. Can you help? (See text for more detail).

Eliminator Eliminated

Another cry for help (also via E-mail) came from *PW* author **Ray Fautley G3ASG**. Ray has had a slight accident with his S.E.M. QRM Eliminator, but I'll let him describe the problem. "Do you remember the company S.E.M. on the Isle of Man? I have one of their QRM Eliminators which doesn't seem to do anything at all when connected as described in their information leaflet.

"It used to work OK, until I tried to use it with the transmitter output going through it. This should have been alright according to their information, but there was a very short duration "sparky" sound as I pressed the TX key - and now it doesn't work at all! On looking through magazine adverts the firm seems to have vanished completely. Do you know where I could send it for repair? Perhaps one of your readers has knowledge of the circuit and could help me repair it". If you can help Ray in any way then please contact him directly (he's QTHR) or via the office.

'Upside-Down' Dipole

From 'down-under', **Steve Mahoney VK5AIM** wrote in from South Australia with what he called 'A suggested h.f. dipole from down-under". Steve went on to say, "the idea is not original, I'm not sure where it came from originally. The antenna consists of a 3.5MHz (42m long) dipole, that is broken, electrically at the 7MHz resonant points (21.4m long) and again at the 14MHz resonant (10.6m long) points with insulator blocks.

At the outer ends of the inner wires solder a crocodile (or alligator) clips. With all the crocodile clips made, you have a complete dipole suitable for use on '80'. Unclip the outer pair of crocodile clips and you have a half-wave dipole suitable for 7MHz and, of course, if the inner pair are open then the antenna is suitable for 14MHz instead. The antenna should also be resonant on both 21MHz and 28MHz bands depending on the exact lengths chosen. Using a balun had made little or no difference to the capabilities of the antenna when fed with a reasonable length of coaxial cable.

Steve then went on to say that he uses the antenna when he's out operating portable from his Dormobile. He had a few curious questions from interested onlookers when he was doing a few 'Cut-and-try' experiments in his local park. In use the ends and centre are "hauled-up convenient Gum trees". I don't think there are many Gum Trees here 'up top-side' Steve, but I'm sure that the readers know what to do!

Steve, mentions that he uses a 5m long telescopic mast for the v.h.f. antenna which, in the absence of trees, does sterling service as the support for the h.f. antenna. Steve also mentioned that as Australia still has a low-band v.h.f. television service it's quite easy to obliterate all the TV channels in a caravan park. "Why do people want to watch TV, 200 miles from home?" asked Steve.

Archive Joiners

Looking back through the archives Steve, I found three similar joiner ideas have been published before in *PW*. Back in Antenna Workshop, July 1995 **George Dobbs G3RJV** was talking about portable antennas, and the system he used was shown in the illustration of **Fig. 2** using a 35mm film canister as a weatherproofing shield.

While the version from **Ray Baldwin G3WZ** that was presented August 1994 and shown in **Fig. 3** used short looped retaining straps held by a nut and bolt combination when in the 'open' condition. A third option is shown in the illustration of **Fig. 4**, and for once my archive retrieval skills have failed me, as I cannot call to mind, or even find evidence of who sent this idea in to me some years ago.

I offer my apologies to the original

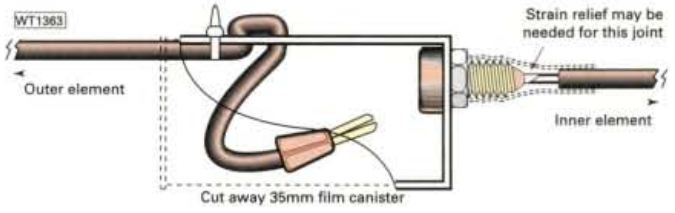


Fig. 2: George Dobbs G3RJV suggested an antenna joiner based on a 35mm film canister. (See text for more detail).

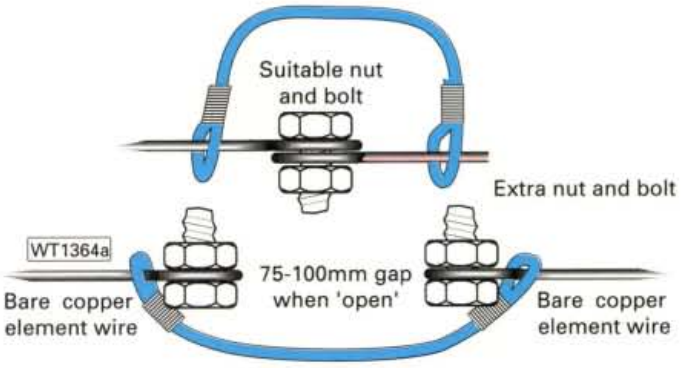


Fig. 3: Ray Baldwin G3WZ's idea for an antenna joiner.

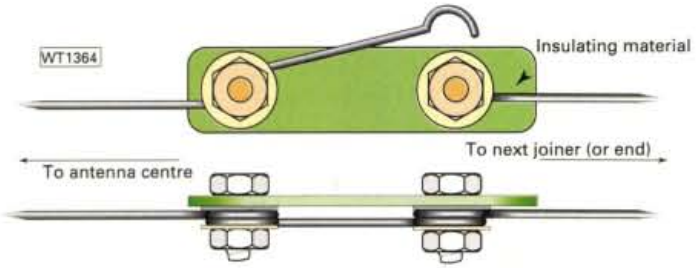


Fig. 4: 'Tex' G1TEX cannot identify the author of this antenna joiner, but it looks a good idea. Do you recognise it as yours? (See text.)

author of this antenna joint method. If you recognise this idea, perhaps you'd like to put me straight and let me know. Now let me turn to a plea for help with understanding how traps work. This is quite topical as we published an idea from **Charles Reynolds GW3JPT** which appeared in last month's *Practical Wireless* magazine ('Antenna Workshop' - 'Plumbing For Traps').

Matching Problems

Matching problems are 'dogging' the W3DZZ antenna of **Dave Reeves G0MVX**. In a short note Dave wrote "My most recent masterpiece is a W3DZZ with coaxial traps. The traps are 'spot on' but I cannot get a decent s.w.r. on 14MHz. All my literature has slightly different lengths quoted for construction, but cut and try as I might, it will not resonate to my satisfaction on 14MHz.

"None of the learned authors explain which bit of wire resonates at which frequency so, I cannot approach the problem from a logical angle". Right, I'll do as you asked Dave and try to explain how the system on 'trapping' a dipole is supposed to work.

Shown in **Fig. 5**, is a W3DZZ similar to the antenna published in the April 1998 issue of *PW*. If you look at it you will see that I've shown two resonant lengths f_{lo} and f_{hi}. The theory states that the **inner length is a halfwave dipole on the highest frequency** (the same as the frequency to which the traps are tuned). The traps supposedly are very high impedance at this frequency (f_{hi}) and so isolate the outer lengths from 'seeing' the signal from the transmitter.

At frequencies well below the trap resonant frequency, the trap is effectively 'not present' so the **whole length of wire becomes resonant at the lower frequency** (f_{lo}) That's the theory at least, and, as with many theoretical ideas there are some differences in 'real-life' and compromises need to be made to achieve a working system. It is also possible to have different compromises, all giving similarly working systems. In most cases the presence of the trap alters the resonant frequencies of both the short and the overall lengths.

I can heartily recommend trying to get hold of an antenna analyser such as one of the MFJ series or of the Auteck pocket-sized instruments if you are going to 'play' with antennas. And it would seem from your letter that you intend to do just that. But how would I tackle the job with an antenna analyser such as the MFJ series or the smaller Auteck analysers?

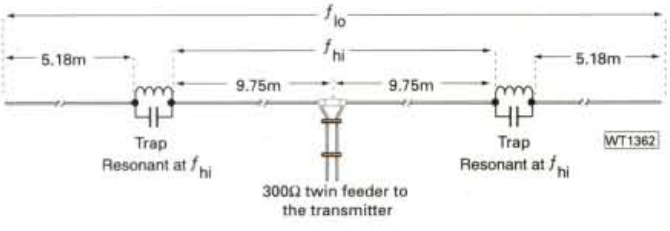


Fig. 5: An extended Double Zepp (EDZ) antenna like this one is proving matching problems for Dave Reeves G0MVX. (See text for more details.)

Bit At A Time

The answer to 'how would I work on a multi-resonant antenna?' is that I'd do a bit at a time. Start with the inner part of the antenna with the traps fitted to the end, but without the outer element sections fitted. Starting with the elements rather longer than the design, and using the analyser, check to find the 'matched' frequency of the **highest frequency band**. This match frequency should be 'on the low side' of the desired frequency.

Next trim off a short length at the ends of the elements, re-attaching the traps, and re-measure the match-point frequency - it should have moved upwards slightly. Continue until the frequency is in the middle of your usual operating area. Now add the outer elements, again slightly longer that you think you will need.

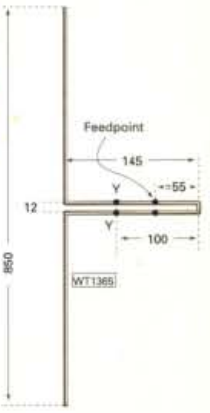
Again find the match frequency, and follow the previous pattern of 'snip-and-test' to move the match frequency into the middle of the operating area of the **lower frequency band**. Now confirm that the match frequency of the higher band hasn't changed too much and make the connections to the traps more permanent and weatherproof. You're ready to go on the bands.

And finally

My final item this month comes from **Brian Williams GW0GHF**, who sent in two Extended Double Zepp (EDZ) antenna designs for 50 and 430MHz. In his covering letter Brian says that he had read, with interest the article by **Mike G3HUT** (September 1999) about the EDZ antenna. "I can thoroughly recommend this antenna for the chap who likes to home-brew" says Brian.

To back up his statement, Brian sent in the designs for 50MHz and 430MHz versions of the EDZ antenna. In the design for 430MHz, shown in **Fig. 6**, the antenna is made from one length of 2mm diameter

Fig. 6: An EDZ antenna designed by Brian GW0GHF, for the 430MHz band.



copper wire to the dimensions shown. By adjusting the feedpoint (both marked 'X') you should be able to get the s.w.r. down to around 1.3:1 at band centre. To improve the matching more you will have to try a "trick-of-the-trade" as suggested by Brain and solder a short length (around 100mm) of coaxial cable across the points marked 'Y' on the feedline. Trim this length of cable until the matching is as low as possible.

The coaxial cable will need a 'choke balun' of either ferrite rings or be made into a one and a half turn coil as close to the feedpoint as possible. Designed to be operated vertically the coaxial cable feeding the antenna should run away horizontally as far as possible before dropping to the shack. If it runs vertically close to the 'lower leg' of the antenna, then the otherwise omnidirectional coverage will exhibit a directional capability.

Design For 50MHz

Brian's design for 50MHz is shown in **Fig. 7** and is designed to be used suspended horizontally , with the coaxial cable dropping away before continuing to the shack. The elements are made from stranded copper wire and the quarter-wave matching 'transformer' should be made from a length of heavy copper wire. Again, ideally, the coaxial feeder if used should be formed into an eight-turn coil as near to the feedpoint as possible.

Ah well, the space has quickly disappeared this month! So, I look forward to meeting you all again in the May issue of PW.

G1TEX

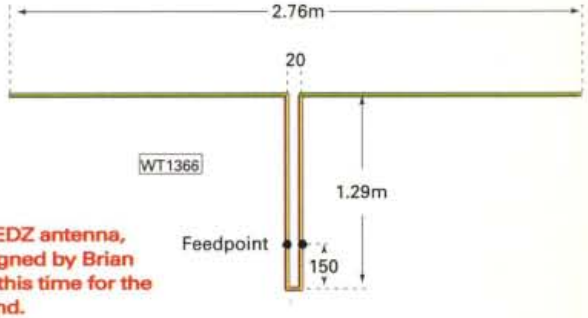


Fig. 7: An EDZ antenna, again designed by Brian GW0GHF, this time for the 50MHz band.

Antenna Workshop

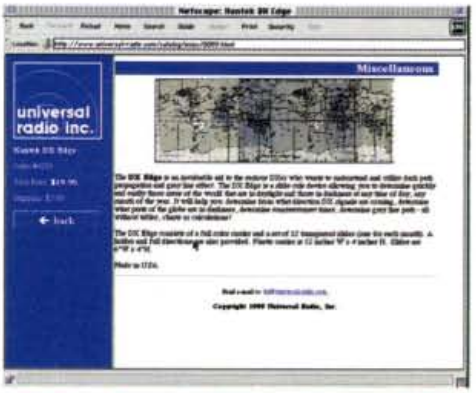


Fig. 2: Start from the Website of Universal Radio Inc., if you would like to buy the DX EDGE.

Greyline Operation

Peering out of the mid-winter gloom, Ray Fautley G3ASG explains how to point your antenna in the right direction, whatever the time of day, year or band you're operating on.

You may have heard the term 'greyline operation' and wonder what on earth it is when applied to radio. So, what is this greyline anyway? You may sometimes hear it referred to as the 'terminator', and it is an imaginary line drawn over the earth's surface that separates the area of darkness from daylight at that particular time and date.

Take a look at **Fig.1**. In March, the greyline passes through the UK at about 0630UTC (dawn), through West Africa and the South Atlantic to Antarctica. At the same time, it is also dusk in the North Island of New Zealand, the Pacific islands and the far east of Siberia. In the illustration, the area which is cross-hatched represents the parts of the world in darkness and the clear area (within that defined by the greyline) is in daylight.

So what? Well, it has been found that propagation, particularly on the lower frequencies, provides most chance of a successful contact when one of the stations is in the area of *daybreak* and the other in the area of *dusk*, both at the same time.

Good Chance

In March there would be a good chance of a UK station using the 3.5 or 7MHz band have a QSO with stations in West Africa, Antarctica, New Zealand, islands in the mid Pacific or the Vladivostok area of Siberia. So, what time could you have these QSOs? Well you'd have to get up a little earlier because the best conditions could be expected around 0600 to 0700UTC.

The answer's easy for the month of March, but how do we find where the greyline occurs at months other than March? Well, now of course you just use a computer program that will display the greyline in real time (see separate panel).

But prior to the popular use of computers, some 20 years ago a device called 'The DX EDGE' was marketed by Xantek, Inc., PO Box 8344, Madison Square Station, New York, NY 10159, USA. (*The product hasn't dissappeared from view, see later.* Ed.)

World map

The DX EDGE consisted of a rectangular ('letter-box' style) world map with two complete world maps side by side (as in Fig. 1), together with 12 plastic overlays. Why 12 overlays, you may ask! Well as we move around from winter to summer(?) and back again, the greyline drifts northwards then southwards again.

So, there's one overlay designed for each month of the year. These overlays can be slid over the world map to locate the greyline for any other location. In use, you align the local time, printed in the top of the slider, on the longitude mark (printed on the map) for your location and the various areas can be seen immediately.

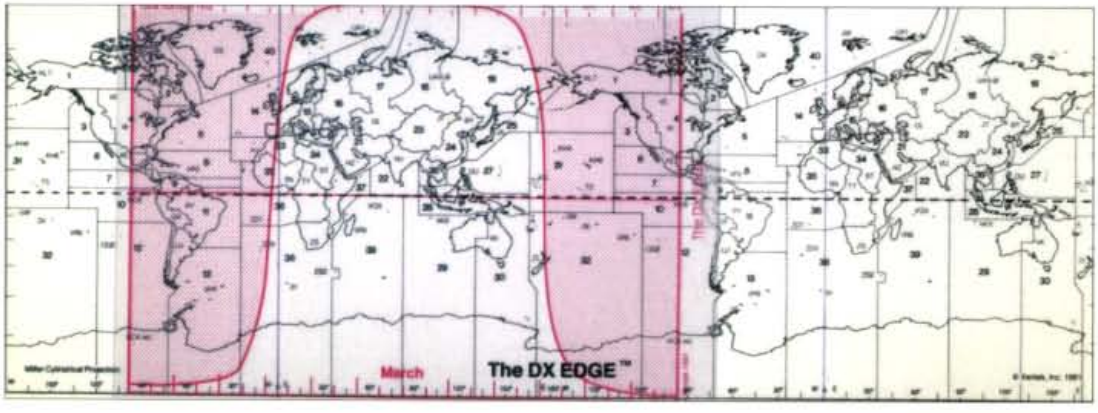


Fig. 1: The DX EDGE greyline display needs no electricity and causes no QRM, but does the job well.

antennas in action

RAY FAUTLEY G3ASG GIVES A FEW 'POINTERS' ON THE DIRECTION OF YOUR ANTENNA

Fig. 3: Geoclock - a well known greyline display program available for the IBM PC or clone.

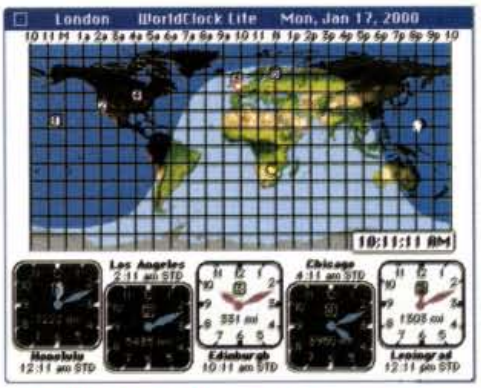


Fig. 4: World Clock Lite, one of the greyline display programs available to run on a Macintosh.

On the higher frequency bands, particularly 21, 24, and 28MHz the best conditions occur during a *completely daylight path* between both stations as indicated by the non-crosshatched area in Fig.1. The various 'rules' of contact are drawn up in **Table 1**, that summarises the best use of the information provided by the greyline to determine where to point your beam (if you've got one!) for best results.

No beam - no chance? Not quite, because even if you haven't got a beam you can always try calling the DX locations at the other end of the greyline when either sunrise or sunset occurs at your own location.

I hope that this may help some of you (who didn't know before) to understand what the greyline is. And it's always there and available to use. Perhaps it may also help you to work a bit of extra DX! Happy greyline hunting!

Still available

Although the DX EDGE is now around 20 years old, and in spite of the apparent 'threat' from computers, the Xantek DX EDGE is still available. Yours sir, for $19.95 + P&P, available from **Universal Radio, 6830 American Pkwy., Reynoldsburg, OH 4368**. For internet users, point you browser at: **http://www.universal-radio.com** then follow the links into the catalogue. I've shown the Universal Radio Homepage here for you, **Fig. 2**, to give you an idea.

I suppose that many of you would like to have a display of the greyline available on your computer monitor and you will not be disappointed at the number of programs available. For the IBM and its clones, the program *Geoclock* (**Fig. 3**) is probably the most well know, but the two greyline programs I've presented below, are both for the Macintosh. No doubt there are more programs available for different PCs that I'm unaware of. If readers would let me know then I'll put the information in a future column.

Macintosh Users

Let me turn to greyline and clock software for Macintosh users who, as a group, seem to suffer with lack of software when it comes to Amateur Radio. However, I've found two programs that offer excellent greyline capabilities. The first of them is from **Chris Smolinski N3JLY** who writes extremely good software for Amateur Radio. The program *Mac Grayliner* has, like most of the programs, a 'real-time' updated greyline map on the desktop. This program also has the option of having the active propagation beacons displayed as well. The Web site to look at is: **http://www.blackcatsystems.com**

Another shareware programs is *World Clock lite* from **Leighton Paul** in America. The program I have is now some six years old but runs perfectly well on the Mac OS8.5. Like *Mac Grayliner* it also displays greyline information along with five clocks (each clock has a distance, in miles from the reference point, shown on its display). Each clock is shown as being in daylight or darkness making viewing even easier, **Fig. 4**. Again updates are carried out in 'Real-time' I find this program about the most useful for 'see at a glance'.

But if you have your own favourite program for this sort of thing, let us know. **G1TEX**

Table 1.

Bands (MHz)	Home location condition	DX location condition	Local time	DX time	Best Direction (at local QTH) To work the DX location
1.8, 3.5 7, 10	On Grey Line	On Grey Line	Sunrise	Sunset	Either Way, Along Grey Line
1.8, 3.5 7, 10	On Grey Line	On Grey Line	Sunset	Sunrise	Either Way, Along Grey Line
All Bands	On Grey Line	On Grey Line	Sunrise	Sunset	Long Path, Great Circle Bearing to DX
All Bands	On Grey Line	On Grey Line	Sunset	Sunrise	Long Path, Great Circle Bearing to DX
1.8, 3.5 7, 10	In Darkness	In Darkness	Night	Night	Long Path, Great Circle Bearing to DX
14, 18, 21 24, 28	In Daylight	In Daylight	Daytime	Daytime	Short Path, Great Circle Bearing to DX

Web-Watch

For *Mac Grayliner*:
http://www.blackcatsystems.com
For *Geoclock*:
http://home.att.net/~geoclock
Universal Radio:
http://www.universal-radio.com

VALVE & VINTAGE

The piles of *PW*s from the 1950s and that large valved reel-to-reel tape recorder on the counter tells us it's Phil Cadman G4JCP in charge of the vintage 'wireless shop' this month!

As it's my first column of the new century - I wish you all very happy New Year/century/millennium (take your pick) from one vintage enthusiast who is beginning to wish he could stay in the 1900s. After all, that's when it all happened, valve-wise. All this fuss over the so-called 'Millennium Bug' ... valves don't suffer from such problems! In my September 1999 column I bemoaned the lack of head de-fluxers (de-magnetisers) for reel-to-reel tape recorders. Well, it seems de-fluxers are available - **but at a price**. Following my comments I received an E-mail from **Roger Horton**.

Roger told me of two suppliers: **StudioSpares** Tel: London **0171-482 1692**, Web site: **www.studiospares.com** and **Canford Audio plc** Tel: Tyne and Wear **0191-418 1122**, Web site: **www.canford.co.uk** Prices are in the £60 to £70 range and that's not including VAT and carriage. Still, my thanks to Roger for the information.

For the less affluent among us, **Stuart Smith VS6XTB**, from Hong Kong, provides an alternative. In an E-mail I received from him a while back he described how, as a 'penniless student', he made his own de-fluxer by taking: "A mains transformer, knock out all the laminations, throw away the 'Is' and keep the 'Es'*. Reinsert all the 'Es' into the transformer core the same way. Then attach to a Variac transformer".

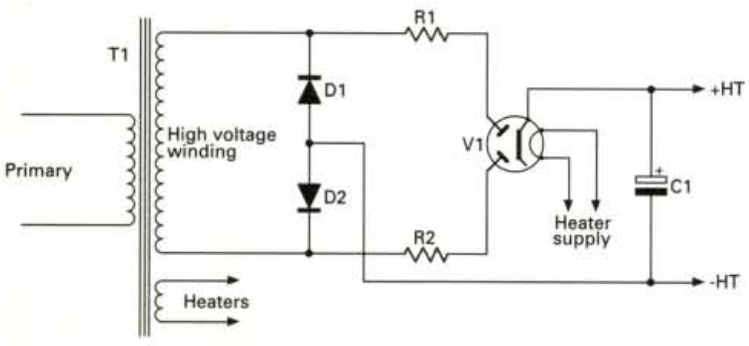
**This refers to the metal lamination 'stampings' which, when complete, look like either an 'I' or 'E'.*

"At 30V a.c. the field is serious, so keep your watch well away. The Variac also serves as a way to slowly reduce the field without a sudden magnetic spike. Don't run it too long as the core gets somewhat warm ... fast".

Thanks for the tip Stuart! And apart from possible safety aspects I can't argue with that, particularly as Stuart tells me his is still going strong after 35 years!

Fig. 1: This circuit was often used as a method of increasing the d.c. output voltage from a power pack. The h.t. secondary would have been the traditional full-wave type (see text).

WS1297



Philips Reel-To-Reel

While on the subject of tape recorders, I recently 'acquired' (courtesy of *PW*'s most generous Editor) a couple of Philips reel-to-reel tape recorders. They're relatively modern machines, all transistor, dating from the early 1970s.

Both machines were in reasonable mechanical and electrical condition, but I was very surprised at the state of the drive belts and idler wheels. Clearly made of similar material, they had turned into what I can best describe as a cross between tar and treacle!

Fortunately, this doesn't seem to be a common problem with Philips machines. Asking around, the consensus of opinion suggests it was poor storage that caused the deterioration of the belt material (naughty Editor*).

**Not guilty (this time) Phil! They were stored indoors with my other tape-recorders, but I can't vouch for the period before I got them! Editor.*

Certainly, older valve-era Philips tape recorders seem immune. However, it would be a good idea for anyone with a Philips tape recorder - or early cassette recorder - to periodically check the condition of the drive belts. In this case, prevention is definitely better than cure - it's dreadful stuff to clean up.

New Applications

Strange, isn't it, how little circuit dodges from the past find new applications. I'm referring to the circuit shown in **Fig. 1**. I was reminded of this circuit only recently but it dates back to the earliest days of silicon rectifiers and maybe some time beyond that.

The circuit was often used as a method of increasing the d.c. output voltage from a power pack. The h.t. secondary would have been the traditional full-wave type; one with a centre tap connected to the negative side of C1.

By disconnecting the centre tap and adding two silicon rectifiers (D1 and D2) as shown, the d.c. output voltage could be doubled. Naturally, the voltage rating of C1 would have to be doubled too.

The voltage regulation is a little inferior to a full-wave circuit (the entire secondary resistance is in circuit all of the time) and the available current is halved. But that wasn't of importance.

You see, back in the days of amplitude modulation (a.m.), transmitter power supplies were rated for a 100% duty cycle. With the addition of two silicon rectifiers and a suitably-rated reservoir capacitor, they could be modified (quite inexpensively) to power the then newly-arrived linear amplifiers.

Under s.s.b. conditions, power valves could be 'persuaded' to use an h.t. voltage anything up to double their a.m. rating. And the lower duty cycle of s.s.b. meant that old a.m. power supplies could be considerably over-run on speech peaks but still stay within their average ratings.

Nowadays, h.t. transformers with centre-tapped secondaries are rare. Fortunately, this circuit also makes it possible to use traditional, full-wave rectifier valves with single-winding secondaries.

Why bother, you might ask? Well, first there's authenticity. A piece of valve equipment really isn't complete without a valve rectifier (just remember to hide the silicon things). But there's a practical reason, too.

Using a valve rectifier - even in conjunction with silicon rectifiers - gives a natural 'soft-start', thus avoiding potentially harmful switch-on surges. In addition, the valve adds a little impedance to the supply. This reduces the 'spiky' nature of the current which flows in a transformer that's feeding silicon rectifiers alone.

Valve audio aficionados have reported improvements compared to all-silicon rectifier arrangements. One reason is believed to be the reduction in the number and amplitude of the harmonics the 'spiky' current waveform contains.

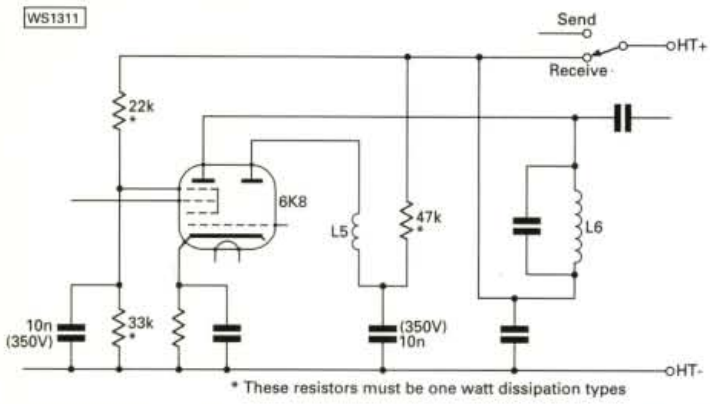


Fig. 2: Modifications to the circuit - originally published in *PW* during 1953, and mentioned in G4JCP's December 1999 column (see text).

The troublesome harmonics can extend throughout the low audio spectrum and might degrade low-level audio signals. (A kind of intermodulation distortion, perhaps?).

Choosing D1 and D2 is easy, just use whatever would suffice for a normal bridge rectifier. As for the valve, peak inverse voltage (PIV) is unlikely to be a problem **but there are things to watch out for**.

First, there's the average current supplied by the valve to be considered and you should not - **under any circumstances** - exceed the valve rating. (Instead, you should preferably 'under-run' it by at least 25%).

Next, measure the resistance of the transformer secondary. If it's less than the minimum value specified in the valve data, add resistors R1 and R2 to make up the difference.

Lastly, consider carefully the value of the reservoir capacitor, C1. Again, **don't use a higher capacitance than the maximum specified**. If you don't know the valve ratings, find a data book or ask someone!

Never Point!

I should have known better; never point out others' failings. My last column featured a 3.5MHz transceiver project from 1953. The purpose being to illustrate the perils of updating old circuits.

I particularly drew your attention to the possibility of drafting errors. Indeed, I told you there was one in the circuit I chose. What I hadn't noticed was a rather more serious error associated with the 6K8 mixer/oscillator valve!

A letter from **George Fisk** from Tyne and Wear pointed it out: the 6K8 shouldn't have more than 100V on its screen grid and triode anode. The circuit I chose had the full 250V h.t. connected to both electrodes.

Although the valve won't be vaporised by such wanton disregard of its maximum ratings, its useful life might be significantly shortened. George kindly included a sketch showing a couple of modifications which keep the offending voltages within the maximum ratings for the 6K8.

Both modifications are shown in **Fig. 2**. Notice that the screen grid of the mixer section is now fed through a potential divider, and that the triode anode has a series resistor. And please note, **only the additional components required** are marked with their values in Fig. 2. The other components are those already present in the original circuit.

If that wasn't enough, I made an error when referring to C5 on page 62 of the December issue. The editorial note near the spot is correct: the capacitor in question **is** the 100pF reaction capacitor connected to the anode of the 6SN7. But it isn't C5! I meant, of course, C15 (in Fig. 2). It never rains....!

Magneta Time

After my various little problems ... at least I've had more luck with my request for information about a tuner-amplifier manufactured by the Magneta Time Company! I was both surprised and very happy to receive a telephone call from a former employee of Magneta, **Anthony (Tony) Parr G0NHS**.

Briefly, Magneta were owned by BVC, the British Vacuum Cleaner and Engineering Company (of Goblin 'Teasmade' and vacuum cleaner fame). They manufactured and installed time (clocking-on) clocks and master/slave synchronised clocks, as well as public address equipment.

As to how a Magneta tuner-amplifier came to end up in Bavaria, Tony provided a possible answer. During the Second World War Magneta supplied sets to the Navy, Army and Air Force Institutes (the famous NAAFI - the shops and canteens run for servicemen).

Unfortunately, as far as Tony's theory is concerned, the set in question covers the Band II v.h.f. f.m. broadcast band, implying a post-war model. Maybe Magneta continued to supply the Services well beyond the end of the Second World War?

Tony also confirmed that Magneta never sold equipment to the general public, hence their absence from domestic radio guides. (They were listed in trade guides, however). Maybe Magneta were one of those companies whose equipment touched the lives of many people but are now largely forgotten?

Despite my desire to stay in the 1900s, I have to admit that one modern invention, now coming very much to the fore, is proving to be almost indispensable. I'm referring, of course, to the Internet. You'll notice that I now have a new E-mail address - **phil@valveandvintage.co.uk** - and a new Web address too - **www.valveandvintage.co.uk** Don't expect to find much there for a while yet, though. Although I suggest that readers forget the 'hype' (which is driving me to distraction), I really do think that the Internet is a very useful communications medium and a marvellous research tool.

Enjoying a seemingly rare and solitary hobby, valve enthusiasts have not been particularly aware of each other. However, the 'Net' now provides a means of communicating with other enthusiasts, on both an individual and collective basis.

American enthusiasts in particular are increasingly putting pictures, schematics and all sorts of valve-related data on the 'Web'. In fact, it comes as a surprise to realise the high level of interest in valve technology there is around the World.

Providing you have a relatively modern computer and a telephone line, the Internet can be an inexpensive addition. Especially when you consider the 'free' Internet Service Providers (ISPs) that are springing up.

There are also 'on-line' editions of several electronics magazines available and at least one magazine (devoted to valved hi-fi) is distributed only via the 'Net'. Best part is, it's free! See **www.bottlehead.com** Similar magazines can be found at: **www.tubecad.com** and **www.glass-ware.com**

Net Access

Unfortunately, I have to say that I'm very concerned that those enthusiasts who don't have access to the Internet will miss out. Indeed, there is the wider concern that many people, not just valve adherents, are not yet (and may never be) able to benefit from the Internet. So, to help ... those of you who have Internet experience - particularly with regard to setting up computers - please offer your help if asked.

Ah, my modem has 'dropped carrier' so I'd better say cheerio until it's my turn in the 'virtual shop' again. Please send your comments and letters to me either via the *PW* offices, via E-mail to: **phil@valveandvintage.co.uk** or direct to: **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX.** *PW*

This month's 'Book Profiles' look at various books covering two subjects. The first three books all concentrate on QRP and that aspect of Amateur Radio which involves the challenge of making QSOs using only low power. These books are: The ARRL Low Power Communications; QRP Power and W1FB's QRP Notebook. The last three books focus on project work and include: 33 Simple Weekend Projects; Build Your Own Intelligent Amateur Radio Transceiver and Build Your Own Test Equipment. So, if QRP or constructional projects are your 'bag' then check out some of this month's 'Book Profiles'.

TELEPHONE, FAX, E-MAIL OR USE THE ORDER FORM ON PAGE 98

Book PROFILES

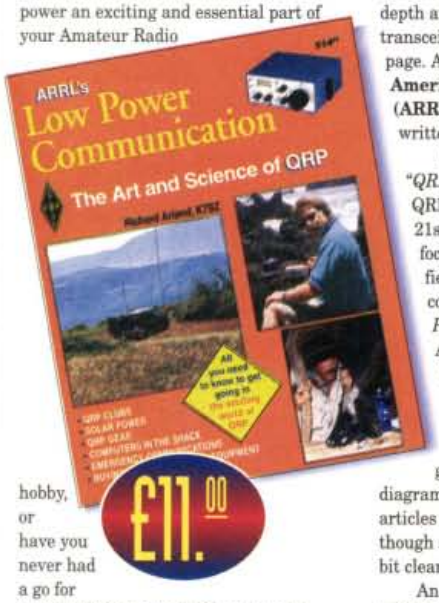
The ARRL Low Power Communication - The Art and Science of QRP

Richard Arland K7SZ

The first three books in this month's 'Book Profiles' are related to QRP and the first one of these is *The ARRL Low Power Communication*. Claiming to have "All you need to know to get going in the exciting world of QRP", this book is written by **Richard Arland K7SZ**, an American Radio Amateur. It's also worth bearing in mind that the book is published by the **American Radio Relay League (ARRL)**.

Doug Hendricks KI6DS writes the Foreword to this book and in it he says: "QRP has shown tremendous growth in the 1990s and I believe one reason is because it is one of the last areas where we can build, experiment, operate and enjoy our hobby for a reasonable cost".

Do you find operating at low power an exciting and essential part of your Amateur Radio hobby, or have you never had a go for yourself? Either way, this book would be of interest, especially to those just starting out in QRP.



According to the front cover of his book, Richard looks at many aspects of QRP including: QRP clubs; solar power; QRP gear; computers in the shack; emergency communications and buying and trading used equipment. The author says, in the first chapter: 'The Essence of QRP', "Welcome to the wonderful and intriguing world of QRP. This book will guide you through a brief history of low power communications and provide you with the basic and advanced skills needed to enjoy the fastest growing facet of the Amateur Radio hobby".

Other chapters in the book include: 'Getting Started'; 'QRP Gear'; 'Advanced QRP Techniques'; 'Antennas for QRP'; 'HF Propagation for the QRPer'; 'Solar Power and Vintage QRP'; 'Computers, Software and the Internet' and much more. Published last year, this book comes **Recommended**.

QRP Power

Published by the ARRL

QRP Power claims to have "The best QRP articles from *QST*, *QEX* and *The ARRL Handbook*, as well as a new, in-depth article on the popular 40-40 transceiver", according to its back page. Another book from the **American Radio Relay League (ARRL)**, *QRP Power* has a Preface written by **Rich Arland K7YHA**.

In the Preface Rich says that: "*QRP Power* is a transition from the QRP renaissance period into the 21st century. The articles herein focus on current trends in the field of amateur low power communications". Much like *Low Power Communications*, this ARRL book will be useful to both the newcomer to QRP as well as a useful "idea pool for the advanced QRPer".

There are a number of good, clear circuits and diagrams in this compilation of QRP articles along with some photographs - though some of these photos could be a bit clearer.

An example of the articles found in *QRP Power* include: 'Low Power Contesting' by Richard Arland and taken from *QST* - March 1996; '6-Meter Transverter Design' by Zack Lau KH6CP/1 - from *QEX*, Sept 1995; 'A Small High Performance CW Transceiver' by Rick Campbell KK7B - from *QST*, November 1995;

'Refinements in Crystal Ladder Filter Design' by Wes Hayward W7ZOI - from *QEX*, June 1995 and many more.

If a compilation of articles on QRP is what you are looking for then this book would be worth a second look and it comes **Recommended**.

W1FB's QRP Notebook

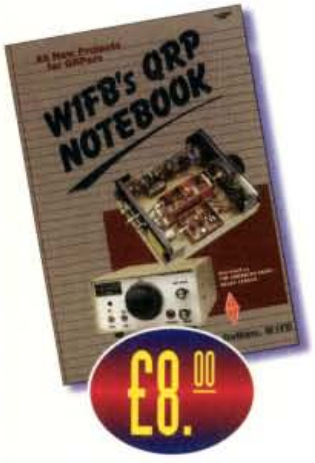
Doug DeMaw W1FB

Written by the well known and well respected **Doug DeMaw W1FB**, ***W1FB's QRP Notebook*** is also published by the **American Radio Relay League (ARRL)** . It looks at most aspects of QRP in W1FB's, easy-to-read, notebook style.

In the 'Author Message And Acknowledgements', Doug W1FB says: "If I were asked to offer a single statement of encouragement to the body of amateurs world-wide, it would be something like this: Make an effort to avoid technical complacency. Don't rely on commercial equipment when assembling your amateur station. Experience the thrill of building transmitters and receivers and gain valuable experience in the process. Half of the fun associated with our grand pastime is based on communicating by radio with equipment we have built".

If this sounds like a statement which you agree with then this book will be of interest to you. Whether you're an old hand at QRP, or a mere beginner in low power. *PW*'s very own 'Carrying On The Practical Way' author, **Rev. George Dobbs G3RJV**, says in the book by his friend, the late Doug DeMaw, that he "commended the first edition of the book to many Radio Amateurs in the UK" - how much more recommendation do you need?

Focusing more on the constructional side of QRP, *W1FB's QRP Notebook* has numerous clear circuits and diagrams and the aspects of QRP covered are: 'QRP Construction Methods'; 'Receivers For QRP'; 'QRP Transmitters & Techniques'; 'QRP Accessories' and 'Technical Bits &



Pieces'. This is a thorough book and each chapter is divided up into various sub sections referring to important aspects of each topic.

If you've read any of Doug DeMaw's work before and you fancy having a go at QRP, then this could be the book for you. **Highly Recommended**.

33 Simple Weekend Projects - for the Ham, the Student, and the Experimenter

Dave Ingram K4TWJ

The last three books in this month's 'Book Profiles' are books which concentrate on projects. This next (American) book, *33 Simple Weekend Projects* was featured in the July 1999 **Antennas-in-Action**, **Tex Swann G1TEX's** bi-monthly series on antennas. Here is what he had to say about it:

"My final book for this month would appear at first sight, from the title at least, to be an electronic projects book. Published by **CQ Publications Inc.**, *33 Simple Weekend Projects* (for the Ham, the Student and the Experimenter) written by **Dave Ingram K4TWJ**, covers many parts of our hobby.

"A quick estimation is that almost half of the projects are 'antennery' in nature. There are antennas for h.f. as well as v.h.f./u.h.f., with a smaller foray into mobile antennas. I'm not sure about 'winking' (miniature neon bulb) lights on antennas though.

"Leaving aside the winking light antennas, but staying with mobile operation, there is a good explanation of how to improve your mobile station by using two antennas and feeders at the same time".

As the front cover suggests, this book will make a good addition to your library if you would like to get younger people involved in the hobby. Some of the chapters include: 'The Joys of Homebrewing'; 'Elmer's Sugercoated Electronic Theory'; 'HF Antennas'; 'Special Treats for VHF Enthusiasts' and 'A Potpourri of Fun Projects' - and more.

Why not pick up a copy of this book and involve someone younger in Amateur Radio? **Recommended**.

Build Your Own Intelligent Amateur Radio Transceiver

Randy L Henderson

These next two books come from **TAB - The Electronics Authority - A division of McGraw-Hill** publishers. This book is also American in origin and claims to give the reader "Complete guidance on building, using and enjoying a sophisticated radio transceiver".

There's another important word dropped into the text on the back page of the book and that is "low-cost"! So, if you would like to have a go at building your own transceiver without it costing you an arm and a leg then this could be the book for you (always keeping in mind its American origins, of course).

Consisting mainly of text with mainly diagrams and a handful of black and white photographs thrown in for good measure, *Build Your Own Intelligent Amateur Radio Transceiver* is quite a hefty book consisting of around 350 pages. Some of the aspects covered in the book include: 'Audio circuits'; 'Double-sideband voice and CW modes'; 'Signal generation'; 'A synthesiser for your transceiver'; 'Transceiver design choices'; 'A spectrum analyser project and test equipment issues' and much, much more. This book is **Recommended**.

Build Your Own Test Equipment

Homer L Davidson

"Why build your own electronic test equipment"? That's the question that *Build Your Own Test Equipment* asks itself. It replies: "Whatever your level of expertise, building your own electronic test equipment is a great way to save money on the instruments you need and on the rising cost of household appliance repair". (As the Editor of *PW* is sure to agree!).

This book is once again American in origin - always worth bearing in mind when looking at books of a technical nature. *Build Your Own Test Equipment* covers all sorts of appliances and doesn't concentrate on Amateur Radio (as you will see from the list below, 'Ham' radio is just one part of this book) and is aimed more at the electronics enthusiast.

Build Your Own Test Equipment claims that with it you can "Learn how to build and use instruments for troubleshooting: Televisions; Stereos; Computers; Compact disc players; Ham radios; Microwave ovens; Camcorders; Electric motors; Power supplies and cables - And much more"!

Full of diagrams, circuits and black and white pictures, this book is nevertheless well illustrated and if you are the kind of person who is interested in all things electronic, then this book would be a useful addition to your Amateur Radio/Electronics library. **Recommended to electronics enthusiasts**.

Book PROFILES

RADIO DIARY

2000

February 13: The Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield, in one large hall, just out of town on the Horbury Road, easy access from M1 J39 & J40 - well signposted and with talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). Details from **Roy G0TBY** on **(01924) 893321** (combined telephone and FAX number), E-mail: **rally@sandalmagna.demon.co.uk** or check their Web site at: **http://www.sandalmagna.demon.co.uk/rally/**

February 13: Cambridge & District ARC are holding their annual club Rally and Car Boot Sale in the Ambulance station at Addenbrookes Hospital, Cambridge. Opens at 1000 for disabled visitors, 1030 to the general public. There will be a Bring & Buy, WC, Bar, Talk-in on S22, car park, adults £1.50, children free. For further information contact **John Bonner G0GKP, 40 Lyles Rd, Cottenham, Cambridge CB4 4QR** or Tel: **(01954) 200072**.

***March 11/12:** The London Amateur Radio & Computer Show. There will be the usual mix of exhibitors at this two-day event, including: computer software providers, special interest groups, a large Bring & Buy, local clubs, large and small Amateur Radio equipment dealers, electronic component vendors and lots more. In addition there will be free parking, family attractions (sport, cinema, swimming, golf, etc.), bar and restaurants, lectures, on-demand Morse tests, disabled facilities and a talk-in. Further information is available from **RadioSport** on **(01923) 893929**.

March 12: The Wythall Radio Club are holding their 15th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham. Doors open 1000 till 1600 and admission is only £1.50. Plenty of traders in three halls and a large marquee with bar and refreshment facilities on site plus a big Bring & Buy stand. Talk-in on S22. There will also be a unique free park and ride for easy and comfortable parking. Contact **Chris G0EYO** on **0121-246 7267** evenings, weekends for details, FAX: **0121-246 7268** or E-mail **chris@g0eyo.freeserve.co.uk**

March 18: The 7th West Wales Amateur Radio & Computer Rally will be held at Penparcau School, Aberystwyth. Doors open 1000 till 1530 and admission is just £1. Good parking facilities with easy access for disabled and traders for all stalls. Demonstrations of h.f., v.h.f., packet on the air. Amateur Radio and Computer Traders, Bring & Buy, clubs and special interest groups. Catering facilities also. Talk-in on S22. **Ray GW7AGG** on **(01686) 628778** or home QTH.

March 19: The Norbreck Amateur Radio, Electronics and Computing Exhibition, organised by the Northern Amateur Radio Societies Association (NARSA), is to be held at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country. **Peter Denton G6CGF** on **0151-630 5790**.

March 19: Bournemouth Radio Society's 13th annual sale is to be held at Kinson Community Centre, Pelhams Park, Millhams Rd, Kinson, Bournemouth. Doors open 1030 and close at 1630. Talk-in from G1BRS on 144MHz/S22. Amateur Radio and computer traders, clubs and specialised groups, excellent refreshments, admission £1. Details from **Olive** or **Frank Goodger**, **66 Selkirk Close, Merley, Wimborne, Dorset BH21 1TP** or Tel: **(01202) 887721**.

April 16: The 16th Yeovil QRP Convention is to be held at Digby Hall, Sherborne, Dorset. Doors open at 1000, talk-in on S22. There will be traders, construction challenge contest judging, three talks, QRP forum, in-hall catering, free parking, invalid facilities. Further details on **(01935) 813054**.

April 16: Swansea ARS will be holding their annual show in the Swansea Leisure Centre on the A4067 Swansea-Mumbles coast road. Doors open 1030-1700 and attractions include: trade stands, Bring & Buy, local interest groups and full catering & licensed bar. Admission is only £1, children just 50p. Further details from **Roger Williams GW4HSH**, Show Secretary, on **(01792) 404422**.

April 16: The Cambridgeshire Repeater Group are holding their annual rally at Bottisham Village College, Bottisham, which is six miles east of Cambridge, access is via A14 and A1303. Features include a large hall, car boot sale, Bring & Buy and their renowned auction of radio and electronic equipment. Doors open 1030 and admission is £1.50. Refreshments available. Talk-in on S22. **Paul Dyke G0LUC** on **(01462) 683574**.

May 1: The Mid-Cheshire Amateur Radio Society are holding their Amateur Radio & Computer Rally at the Civic Hall, Winsford, Cheshire. Doors open at 1100 (1030 for disabled visitors). Admission is still only £1. The rally features a large Bring & Buy stall plus lots of varied Traders, full catering with Bar service, ample free parking. Contact **David Bevan G4XUV (01606) 77787**.

May 7: The Drayton Manor Radio & Computer Rally will be taking place at Drayton Manor Park, Fazeley, Tamworth, Staffs on A4091. Main traders in four marquees, large outside traders flea market, Bring & Buy stall, local clubs and special interest stands. Opens 1000 onwards. Trade information from **Norman 0121-422 9787**, other information from **Peter G6DRN 0121-443 1189**, evenings please.

May 21: The Three Counties Radio & Computer Rally is to be held at Perdiswell Leisure Centre, Bilford Road, Worcester. There will be trade stands, radio and computer dealers, parts and accessories, refreshments, licensed bar and free car parking. Trade stands available, contact Eddie Cotton on **(01905) 773181**.

May 28: The East Suffolk Radio Rally (the Ipswich Radio Rally) will take place at 'The Hollies', IACSSA, Straight Road, Foxhall, Ipswich. The ESWR is now principally a large car boot sale with indoor trader and special interest group support. Open from 0800 for traders and 0930 for buyers. In common with many rallies, the event will close mid afternoon. Talk-in will provided on S22. Further details from **Sam Jewell G4DDK** on Tel: **(01394) 448495**

June 18: The Newbury & DARS will be holding their 14th annual Amateur Radio Car Boot Sale at Cold Ash playing field near Newbury, Berkshire. Sellers/traders should arrive at 0800 and the sale will be open from 0900-1500. Sellers/traders don't need to pre-book and the charge is £9 per normal size pitch. Any telephone enquiries should be made to **George Cook** on Tel: **(01488) 682814**.

June 25: The Bangor & District ARS are holding their summer Radio & Computer Rally where a good selection of traders will be attending and the always excellent Bring & Buy will be in operation. With the addition of a new computer section, this rally should be even better than last year's! It will be located at the Clandeboye Lodge Hotel, Bangor. Doors open at 1200 and admission is £2. Further details from club Web site: **http://welcome.to/bdars** or **Mark MI1DRU** on Tel: **0289-058 6515** or E-mail: **mi1dru@amrad.net**

July 9: The 11th York Radio Rally will be held in the Knavesmire Building, York Racecourse, York. Doors will open at 1030 and admission is £2 - children accompanied by an adult will be admitted free. Ample free parking, Amateur Radio, electronics and computers, Morse tests and repeater groups, refreshments and licensed bar. Talk-in on S22. Further details from **Pat Trask G0DRF** on **(01904) 628036**.

August 13: The 11th Great Eastern Radio & Computer Rally is to be held at the Park High, Queen Mary Rd, Gaywood, Kings Lynn, Norfolk. Refreshments will be available all day. Talk-in on S22, free parking, Bring & Buy and lots more. Contact telephone No. is **(01553) 841189**. For latest, please see **www.qsl.net/G3XYZ**

October 15: The Blackwood Radio, Computer & Electronics Rally is to be held again at the Newport Centre, Newport, South Wales which is one mile from Junction 25A on the M4. Opens at 1030/1100, there will be a Bring & Buy, Talk-in, car parks, trade stands, special interest groups, licensed bar, catering, disabled facilities and family attractions. Further information can be obtained from **Mr S Instone GW0NPL** on Tel/FAX: **(01495) 240260/(07970) 777756** or E-mail: **fireham@aol.com**

November 12: The Midland Amateur Radio Society are holding their 12th Radio & Computer Rally at Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open at 1000. There will be a large, free car park, special interest exhibits, local clubs, etc. More trader information from **Norman G8BHE** on **0121-422 9787** or general information from **Peter G6DRN** on **0121-443 1189**.

November 12: The Tenth Great Northern Hamfest takes place at the Metrodome Leisure Complex, Queens Road, Barnsley, South Yorkshire. Doors open at 1000. For further information please contact the Hamfest Manager, **Ernie Bailey G4LUE** on **(01226) 716339** or **(07787) 546515** (mobile), **8 Hild Ave, Cudworth, Barnsley, Yorkshire S72 8RN**.

PW

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.
The Editorial Staff of *PW* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. - Editor

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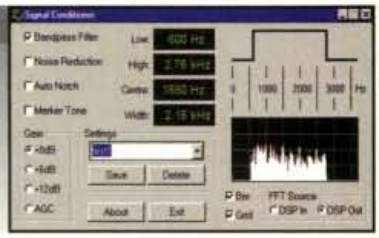

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Frequency range	0.5-1300 MHz	0.15-1500 MHz	0.15-1500 MHz
Modes	AM,SSB/CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W
Tuning step size	100 Hz (5 Hz BFO)	100 Hz (1 Hz for SSB and CW)	100 Hz (1 Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 9 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 9 kHz (AM) 17 kHz (FM-N), 230 kHz (W)
Receiver type	PLL-based triple-conv. superhet		
Scanning speed	10 ch/sec (AM), 50 ch/sec (FM)		
Audio output on card	200mW	200mW	200mW
Max on one motherboard	8 cards	8 cards	3-8 cards (pse ask)
Dynamic range	65 dB	65 dB	85dB
IF shift (passband tuning)	no	±2 kHz	±2 kHz
DSP in hardware	no - use optional DS software	use optional DS software	YES (ISA card ONLY)
IRQ required	no	no	yes (for ISA card)
Spectrum Scope	yes	yes	yes
Visitune	yes	yes	yes
Published software API	yes	yes	yes (also DSP)
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DAVID BUTLER G4ASR SHEDS A LITTLE LIGHT ON THE POLITICS INVOLVED IN THE AMATEUR RADIO HOBBY

RadioScene

VHF REPORT

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

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HEREFORDSHIRE HR2 0HP

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THIS MONTH DAVID BUTLER G4ASR HAS DETAILS OF TRANSATLANTIC PROPAGATION AND MAKES SOME COMMENTS ABOUT THE RECENT DTI PRESS RELEASE CONCERNING THE 3.4GHz BAND.

Recently I've been reporting about some very long distance contacts that have been made via tropospheric propagation over marine paths. I mentioned that the 4754km contact across the Pacific Ocean between W1LP/MM and KH6EME was a world record for the 144MHz band.

Richard Harrison KB5WZI reported that he found the Bermuda duct to be the most interesting of all marine paths. When sailing the Caribbean Sea he routinely watches u.h.f. TV broadcast stations well over 100 nautical miles away.

This information has now prompted **Povl Thim SM7TWW/EI9CSB** to inform everyone about similar experiences of tropospheric ducting in the Caribbean Sea. Some 30 years ago, back in 1970, he sailed as an Engineer aboard a small tanker. Some TV sets had been purchased and these were installed whilst docked at Georgetown, Guyana.

The TV antenna was a standard marine omni-directional vertical without a pre-amplifier. When it was switched on they were surprised to receive an excellent picture with clear sound.

Povl knew there was no TV broadcast station in Guyana or Surinam and that the nearest transmitter, a low power unit in Venezuela, was over 350km away. When he finally got a station identification it turned out to be from Puerto Rico, over a path of approximately 1400km - he mentions that a report of the audio would have been 59+20dB!

On this side of the Atlantic Ocean Povl has heard stations in the Canary Islands (EA8) contacting stations in Ceuta & Melilla (EA9) via the 144MHz Irish repeater on Mount Leinster. This would be a marine path approaching 3000km. Povl also reports that whilst working in Liberia (EL) it was quite common for Spanish co-workers to contact home to the north western area of Spain via mobile sets operating at 70MHz.

A few months ago the RSGB reported on their regular weekly news bulletin that **Mark Hattam G4KGA** had received signals on the Band II v.h.f. f.m. broadcast band which were thought to emanate from North America. At 1155UTC on November 29 whilst monitoring 87.7MHz for meteor scatter propagation Mark was surprised to receive a five second burst of audio with American voices.

The frequency was 50kHz below the nominal frequency for Channel 6 television in North America. Although it has nothing to do directly with Amateur Radio, it may have important implications for anyone striving to make the first transatlantic contact on the 144MHz band.

TRANSATLANTIC PATHS

The shortest distance transatlantic path is probably that from the north west corner of Ireland to Newfoundland which is around 3100km. Assuming an Earth radius of 6400km, the path will subtend an angle of 27.7° at the centre of the Earth and, more importantly, the intersection of two tangential rays is at a height of 192km. The slant range from each ground station to the mid-path point is 1578km.

Readers may object to the use of 4/3 Earth radius (as described in 'VHF Report', January 2000 *PW*) in this calculation. The 4/3 Earth radius is widely used in v.h.f. propagation calculations to reflect the normal bending of radio waves by refractive index gradients in the lower part of the atmosphere (up to a height of some 20km). However, it's clearly not applicable to distances such as those being considered here.

There are three basic ways a radio wave can be 'bent', thus providing communication between two stations that are not line-of-sight. The first is diffraction, but this is only significant for obstacles whose size is of the order of a few wavelengths at most and need not be considered further.

The second is reflection or scattering modes which includes mechanisms such as meteor scatter (m.s.), aurora and Sporadic-E (Sp-E). The third method is refraction and includes tropospheric ducting, F-layer propagation and, perhaps surprisingly, tropospheric scatter.

REFLECTING & SCATTERING

Natural reflecting and scattering objects occurring high in the atmosphere include meteor trails, Sporadic-E (Sp-E) clouds and auroral curtains - all of these take place in the E-layer, around 100km or so and are too low to support single-hop transatlantic propagation. Therefore, to accomplish a contact via these modes a multi-hop propagation mode will be required.

Fig. 1: The antennas at the QTH of DL2FDX & DL2KP.

The geometry of the minimal double-hop scattering path gives two scattering regions at a height of 47km with a slant range of 777km from the ground stations to each object. The height of 47km is actually too low for most, if not all, of the scattering mediums mentioned earlier, which is in accordance with the normal maximum ranges associated with modes such as m.s. and Sp-E.

A scattering medium at a high of 100km gives a maximum single-hop range of about 2200km. Double-hop Sp-E is a known, but rare, propagation mode on the 144MHz band but nevertheless contacts have been made recently over paths in excess of 3500km. This is significantly greater than the distances currently being considered for the transatlantic path.

There are practical problems in scheduling transatlantic tests via Sp-E as this mode is only predictable in a statistical fashion and the only way to make such a contact is to keep trying. Although a double-hop Sp-E "opening" is two single-hop Sp-E openings back-to-back, neither opening is likely to be obvious to operators as they will be to a totally unpopulated mid-ocean region.

Double-hop meteor scatter at 144MHz is much less plausible. Even if two trails occurred simultaneously with the correct geometry, the signal levels would be too low by at least two orders of magnitude. It remains to consider auroral (or auroral-E) reflection.

There's very little information about the size or efficiency of the reflecting region, but results show that long-distance signals are weak. This suggests that a double-hop mode would result in signals well beneath the receiver noise floor.

The result of two applications of the multiple doppler shifts that cause the strange sound of auroral signals would probably be to spread the signals outside any sensible weak signal bandwidth.

REFRACTION

Refraction includes several interesting modes of propagation. Tropospheric and ionospheric scattering are really refraction from small irregularities in the refractive index of the troposphere or ionosphere.

With these modes there's a maximum range that can be attained before the mutually visible scattering region is at such a height that it doesn't further support the required variations in refractive index. A path length of 3100km is well outside this range.

Tropospheric ducting is another matter altogether, the many contacts from the UK to stations in the Canary Islands, both on the 144MHz and 430MHz bands, are almost certainly supported by this mode. Distances equivalent to

that of the transatlantic path have been accomplished on many occasions.

This clearly suggests that a suitably positioned weather system could support a transatlantic QSO on the 144MHz band and, intriguingly, perhaps a 430MHz contact as well. So, it would seem that the only two likely propagation modes to support transatlantic v.h.f. communication are double-hop Sp-E or tropospheric ducting.

In both the cases of double-hop and Sp-E, the analysis is in line with operator experience which shows that these two modes can deliver remarkably high signal levels at great distances unlike some of the other well known DX modes such as m.s. or aurora. Why don't you give it a try!

'KEYLINES' COMMENT

Last month in 'Keylines', **Rob Mannion G3XFD** commented on the **Department of Trade & Industry (DTI)** press release regarding a consultation into radio frequencies at 3.4GHz. These frequencies, previously licensed to a **Ionica PLC** were returned to the Government as a result of the company going into receivership in October 1998. (Ionica PLC was originally awarded a licence to operate a **Fixed Wireless Access (FWA)** service using frequencies in the 3.4GHz band in 1993).

What is FWA? I hear you ask. Fixed Wireless Access (FWA), also commonly referred to as **Radio Fixed Access (RFA)** or **radio in the local loop (RLL)**, is the use of radio to provide the so-called 'last mile' connectivity between a fixed telecommunications network and the customer.

The conception of radio access systems was driven to enable rapid and cost-effective services to be offered in direct competition to the local loop provided by copper wire and optical fibre technology. For all its advantages, the radio technique is subject to one significant limitation and that is the finite number of available frequency bands and for a number of practical reasons, fixed radio connections (transmitter and receiver not mobile) use frequency bands above 3GHz.

The Government consultation exercise specifically concerns two 17MHz wide allocations between 3425-3442MHz and 3475.688-3492.688MHz. Rob asked what are the implications - **if any** - for Amateur Radio?

As you may be aware, the Amateur Radio Service has a 75MHz wide allocation between 3400-3475MHz. Clearly an allocation for fixed wireless access would theoretically cause interference to a large part of the (all-mode section) of the 9cm band.

The amateur band, by the way, is allocated with a secondary status. Stations of a secondary service shall not cause harmful interference to (and cannot claim protection from) stations of primary status to which frequencies are assigned.

Stations of a secondary service can claim protection, however, from harmful interference from stations of the same or other secondary services. I'm not sure if potential FWA licensees will be granted primary status as the band 3400-3600MHz is allocated to the Ministry of Defence for radio location purposes

Adjacent to the two 17MHz wide allocations for FWA are allocations used for programme making and special events and an allocation used by the Home Office for helicopter-borne video links. Additionally, there's a Fixed-Satellite (space-to-earth) primary allocation in this band. Potential licensees must therefore demonstrate that their equipment will not interfere with, and be resilient to interference from, other users of the band.

So, what can be done to counter or minimise the effects of commercial pressure on 'our' frequencies? Because it uses an international natural resource - the radio spectrum - Amateur Radio must organise nationally and internationally for better mutual use of the radio spectrum among Radio Amateurs throughout the world and to successfully interact with the agencies responsible for regulating and allocating radio frequencies.

The **Radio Society of Great Britain (RSGB)** is an example of this organisation on a national scale having regular meetings with the **Radiocommunications Agency (RA)**. At the international level, national societies throughout the world work together for the international good of Amateur Radio under the auspices of a representative democracy, the **International Amateur Radio Union (IARU)**.

One person in particular, **Wojciech Nietyksza SP5FM**, has played a very important role as an IARU representative at CEPT and ITU meetings. In early 1998, Wojciech reported that he had worked hard for the amateur allocations in the new **European Common Allocation (ECA)** table- this table was important as a continent-wide table had never been created before and other regions were likely to follow this precedent

At the start of the process, which covered 960MHz to 105GHz, the situation had at first looked hopeless with up to 30% of amateur spectrum at risk. However, by the end of the process, the IARU had managed to retain all the existing bands and had obtained a secondary allocation at 3.4 to 3.5GHz

(Note - although the UK already had the 3.4GHz band many European countries did not have such an amateur allocation in 1998).

Wojciech SP5FM urged radio societies in CEPT member countries to approach their national administrations with a view to obtaining an allocation as soon as possible. He suggested that if the full 100MHz wide band were not possible then a reduced allocation from 3400-3410MHz would be beneficial - this would help to retain the allocation through to final implementation of the table with CEPT countries, hopefully leading to a world-wide allocation.

At the IARU conference in Lillehammer (held in 1999), Wojciech SP5FM updated delegates on his recent work at various international meetings. Regarding the 3.4GHz band he had made the point that there was no specific allocation for this in the world-wide ITU Radio Regulations.

Eventually, by having an alliance with military usage a 100MHz wide allocation, as suggested a few years earlier, was granted on a shared secondary basis. This now needs to be requested and implemented by national radio societies.

It's pleasing to note that after SP5FM urged societies to approach their national administrations, a number of European countries (e.g. Austria, Norway, Slovenia) had been successful in obtaining this s.h.f. band for use by the Amateur Radio community. Wojciech reported that further support by countries in the Middle East and Africa was necessary to assist in getting a global allocation.

DEADLINES

That's it again for another month and at least you now know a little bit more about the politics that is necessary to support the Amateur Radio community. Forward any news, views, comments or photographs to the address and by the date given at the top of the column.

THANKS FOR YOUR LETTERS AND GOOD LUCK WITH THE DX. SEE YOU AGAIN NEXT MONTH.

73 David G4ASR

HF FAR & WIDE

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The month of December brought with it a cold snap and all the sharp wintry weather that we associate with it. Although, as far as h.f. propagation conditions are concerned, things just seem to be looking better and better!

Certainly the 28MHz band has been producing the sort of signals that people have been waiting for quite a long time with crashing signals being heard there, as they have on 24 and 21MHz, from all parts of the world.

Reports show that most activity has been taking place on the higher bands over the last month but, having said that, the lower frequency bands have also been carrying a varied amount of DX traffic, much to the delight of the l.f. enthusiasts too.

NOVICE REPORTS PLEASE

Now must surely be the time to be a newly licensed amateur on our bands and what a time the UK Novices must be having on their 28MHz allocation, I'll bet. So, how about some Novice reports for 'HF far & Wide' folks?

Come to think of it, now must also be the time for those amateurs who have taken time off from the hobby to dust of those rigs and sort out the antennas in the garden. There's no incentive like a bit of juicy DX to get the old amateur radio spirit back I reckon!

It's also interesting to see the increase in use of f.m. on the 29MHz segment of the band and how effective the n.b.f.m. mode is there, not just for local nets and ragchewing, but for long-distance contacts too. Our reporters this month all generally agree, though, that conditions are 'on the up'.

So, as the year 2000 passes, let's hope that conditions become as good as they were at, and around, the last sunspot peak, eh?

MORE FROM 136kHz

Another letter came in this month from **John Heys G3BDQ**, who is a keen exponent of the v.l.f. (very low frequency)

JUDGING BY SOME OF THE REPORTS LEIGHTON RECEIVED THIS MONTH - HF CONDITIONS LOOK TO BE ON THE UP!

LEIGHTON SMART GW0LBI BRINGS PW READERS MORE NEWS ON THE HF BANDS

RadioScene

amateur band of 136kHz. John explains that he now runs 140W of c.w. into a top loaded wire antenna on the frequency of 136.54kHz. However, the losses involved because of the very long wavelength and the need for extremely long antennas means that even though 140W is fed into his antenna, John's actual Effective Radiated Power (ERP) is a mere **50mW!**

However, despite the real difficulties of operation on the band which, incidentally, is only 2kHz wide, John has now successfully worked 11 countries there, including Sweden, Germany and Switzerland. Not bad considering that the band is situated below the long wave (l.w.) broadcast band and the antenna losses (for back garden antennas) there are horrendous.

Are there any other readers operational on 136kHz? If so, let us know how you're getting on down there!

YOUR REPORTS

I'll start with your reports now, this time beginning with the 1.8MHz and 3.5MHz bands. **Ted Trowell G2HKU** from the Isle of Sheppey in Kent has listed a single 1.8MHz c.w. contact with 5C8M (Morocco) at 2200UTC, using 70W and a HF6 antenna.

Meanwhile, **Sean Gilbert G4UCJ** of Milton Keynes spent a few nights burning the midnight oil on 1.8MHz and working (amongst others): UU7J (Ukraine) at 2340UTC; RW2F (Kaliningrad) at 0239UTC; 5C8M (Morocco) at 0004UTC; as well as HB9BIN (Switzerland) and LY2CY (Lithuania) at 0230UTC; all contacts being made with an indoor loft mounted wire and 30W of c.w.

Yours truly, GW0LBI, managed to get a couple of new countries on 1.8MHz this month in the form of EA6BH (Balearic Islands) with 5W at 2346UTC and CN8WW (Morocco) at 2259UTC with a massive 25W of c.w. into a 60m end fed wire antenna.

The reliable 3.5MHz band didn't seem to attract too much attention from our reporters this month despite conditions there being reasonably good. Some are inevitably put off this useful band by the levels of QRM there, both from amateur and commercial stations during the evening time but, nevertheless, 3.5MHz is a very interesting and effective DX band, albeit at the right time of day of course!

However, Sean G4UCJ jumped in the deep end and reports a couple of nice 3.5MHz contacts there including W1MK (USA) at 0050UTC, UA9YBA (Asiatic Russia) at 0026UTC, and J45T (Rhodes) at 2113UTC. Other contacts included ZB3FK (Gibraltar) at 2359UTC and 5C8M in Morocco again at 2355UTC.

THE 7 & 10MHz BANDS

From down in Bishopston near Swansea comes **Robin Trebilcock GW3ZCF**, who has been operating with a newly erected 7MHz horizontal loop antenna. He's rightly pleased with the results he's been getting from his new antenna, as it outperforms his vertical antenna in most directions.

On 7MHz Robin has listed two 100W c.w. contacts with A61AN (United Arab Emirates) at 0011UTC and TA1BM (Turkey) at midnight, while on 10MHz he hooked up with V47GU (Federation of St. Kitts and Nevis Islands) at 0052UTC. Seems to be doing the job, Robin!

Meanwhile, **Carl Mason GW0VSW** of Skewen in West Glamorgan used QRP at 4W on the 10MHz band and hooked up with 3A/VA3EU (Principality of Monaco) at 1735UTC and A61AJ (United Arab Emirates) at 2043UTC. Ted G2HKU worked nearly all the h.f. bands this month and his offerings on 7MHz included HZ1HZ (Saudi Arabia), J4HT (Greece) and JA3ZOH (Japan) all at around 2200UTC, while his 10MHz crop included OY2H (Faroe Islands) at 1700 UTC and EA8/DJ1OJ (Canary Islands) at 2000UTC.

THE 14MHz BAND

When conditions have been poor, the 14MHz band has often been the most reliable daytime band of all the h.f. allocations. But when conditions are good it can certainly prove to be one of the best, if not one of the most congested!

This month Robin GW3ZCF hooked up with ZP9XG (Paraguay) at 0044UTC, 9Y2SF (Trinidad & Tobago Islands) at 2007UTC, VP2MCS (Montserrat Island) at 1707UTC, as well as VP5JM (Turks & Caicos Islands) at 0035UTC and PY2VA (Brazil) at 2012UTC all using his new horizontal loop and 100W of c.w.

Ted G2HKU spent most of his on-air time using the higher frequency allocations this month so he offers a single 14MHz c.w. contact in the shape of 5A1A (Libya) at 1900UTC, as does Carl GW0VSW who hooked up with VK3CAZ (Australia) at 0852UTC using just 3W of c.w.

THE 18MHz BAND

The narrow 18MHz band has rapidly become a favourite of many amateurs since its introduction as one of the WARC bands in the 1980s and it continues to prove a very versatile and useful DX band. Someone who likes operating there is Sean G4UCJ, who used c.w. at 30W and an indoor antenna to work FG/G3TXF (Guadeloupe) at 1800UTC, XU7AAV (Cambodia) at 1403UTC, XX9TDX (Macao) at 1439UTC and HI3K (Dominican Republic) at 1158UTC.

Meanwhile, using just 2W of c.w. into a G5RV antenna was Carl GW0VSW, who snagged OH0RJ (Alaand Island) at 0900UTC, 3A/VA3EU (Principality of Monaco) at 1433UTC and YV7/K9ZO (Venezuela) at 1836UTC.

Fig. 1. The 7 & 14MHz QRP station of Clemed Nilsson SM7DRH, a regular QRPer on these two bands.

THE 21MHz BAND

Now we come to the three bands where all our reporters spent a great deal of time this last month and who can blame them? For his part, Ted G2HKU used his usual c.w. mode to hook up with 3W7TK (Vietnam), JY9NX (Jordan) and VP5/K4LS (Turks & Caicos Islands) at around 1600UTC, while operating at 1900UTC brought him V47BY (Federation of St. Kitts & Nevis Islands) and at 2000UTC he snagged C6AJX (Bahamas) and CE3F (Chile).

Meanwhile, Sean G4UCJ lists his 30W c.w. contacts with 5N0W (Nigeria) and J3A (Grenada Island) both at around 1400UTC, with 6Y3A (Jamaica) coming in at 1703UTC and XU7AAV (Cambodia) being worked at 1150UTC.

Also active on 21MHz this month was Robin GW3ZCF who caught himself a bagful of nice DX contacts including FR5GS (Reunion Island) at 1634UTC, PY2NJ (Brazil) at 1724UTC, CN8MC (Morocco) at 1708UTC and 4L4CR (Republic of Georgia) at 1020UTC.

Robin's other contacts on 21MHz included N7TO (USA) at 1724UTC, RA9AJX (Asian Russia) at 1414UTC, 4Z5LF (Israel) at 1650UTC and CX7BF (Uruguay) at 1612UTC.

THE 24MHz BAND

The 24MHz band is another of our narrow h.f. allocations and, although it's just 100kHz wide, it's really a case of never mind the width, feel the quality! The 24MHz band, like 18MHz, is another of those bands where operating is more relaxed and laid back than on the mainstream h.f. allocations and it makes for very nice DXing too!

This is where Sean G4UCJ picked up a couple of decent DX contacts which included VQ9VK (Chagos Island) at 1604UTC, V51AS (Namibia) at 1537UTC, HC8N (Galapagos Islands) at 1243UTC, K7AR/C6A (Bahamas), ZL4WA (New Zealand) at 1147UTC and XE3/OH2VB (Mexico) at 1500UTC.

Sean's other contacts included 6W6/K3IPK (Senegal) at 1600UTC, HC5AI (Ecuador) at 1551UTC, VK8AV (Australia) at 1246UTC, V47GU (Fed. of St. Kitts & Nevis Islands) at 1157UTC and HI9/DK8YY (Dominican Republic) at 1643UTC.

Carl GW0VSW lists two 3W c.w. contacts on 24MHz in the

form of 9H3MH (Malta) at 1558UTC, and FG/G3TXF (Guadeloupe) at 1623UTC. While Ted G2HKU worked VQ9VK (Chagos Island) who Ted says was a "real 5NN, a colossal signal" at 1500UTC and E4/G3WQU (Palestine) at 1100UTC.

THE 28MHz BAND

Finally we come to the 28MHz band where John Heys G3BDQ of Guestling near Hastings reports 100W s.s.b. contacts with S79BE (Republic of Seychelles), S21YJ (Bangladesh), KH0/JF1RPZ (North Mariana Island), HC8A (Galapagos Islands), V26SW (Antigua and Barbuda Islands), 8R1Z (Guyana), plus 3B8/KD6WW (Mauritius) and YS1/KA0UBH (El Salvador), all contacts taking place between 1330 and 1430UTC.

From Melksham in Wiltshire comes **Jon Wheeler G0IUE** with his usual single-band report for 28MHz and what a time he's had this month! Working entirely from his car during the lunch hour as well as travelling to and from work, Jon lists 100W s.s.b. contacts with W5GG (Texas USA), HR1RQF (Honduras), KP2/EI2CA (US Virgin Islands), SV8EP (Kefallonia Island), 4L4FL (Republic of Georgia), 9K2SH (Kuwait), SV2BRT (Greece) VE3AZA (Canada), as well as an absolutely huge list of stations from all over the USA.

Not to be outdone, Sean G4UCJ offers a list of 30W c.w. contacts on the 28MHz band which included 3W7TK (Vietnam) at 1300UTC, FR5BT (French Reunion Island) at 1449UTC, 5R8GL (Madagascar) at 1356UTC, HZ1AB (Saudi Arabia) at 1200UTC, VK2IA (Australia) at 0900UTC, SU9ZZ at 1030UTC, PY0FZO (Fernando De Nohorona Island) at 1425UTC, 6V6U (Senegal) at 1103UTC, as well as 9G5ZW (Ghana) at 1419UTC and ZD8A (Ascension Island) at 1128UTC.

Carl GW0VSW was also pleased with his sessions on 28MHz as he managed to work four new countries on the band this month. These contacts came in the form of V26X (Antigua & Barbuda Islands) at 1600UTC, while VP5B (Turks & Caicos Islands), P40V (Aruba Island) and PJ2I (Netherlands Antilles) were worked at around 1700UTC.

Now down to Kent where Ted G2HKU had a pretty busy time on the 28MHz band using 70W of c.w. to work amongst others J2A (Djibouti) at 1100UTC, VP5/KB4IRS (Turks & Caicos Islands) at 1500UTC and ZS6EZ (South Africa), LU7YS (Argentina), 3E1DX (Panama), TU2XZ (Ivory Coast) and ZP5KO (Paraguay), all at around 1600UTC.

Ted also used 5W QRP on the band and lists his low power contacts with 5B4/RW3TJ (Cyprus), CT3KN (Madeira Island), 9H1ZA (Malta) and 5A1A (Libya), all between 1400 and 1600UTC.

To tie up the ribbons this month comes Robin GW3ZCF whose 28MHz list shows his contacts with VP2MCS (Montserrat) at 1649UTC, TO0DX (Guadeloupe Islands) at 1512UTC, QSL via LA9VDA, J3/DL8OBQ (Grenada) at 1700UTC, ZP5SAT (Paraguay) at 1500UTC, as well as 7X2LS (Algeria) at 1404UTC and ZS1WC (South Africa) at 1155UTC.

SIGNING OFF

At long last it's seriously beginning to look as if the long-awaited rise in sunspot activity is approaching. Conditions have taken a turn for the better over the past few months and the trend is looking good. So, fingers crossed folks, let's hope we're seeing the beginning of a good year of DXing in 2000!

Thanks to all reporters for their valuable time and effort. Keep up the good work!

AS USUAL, REPORTS & INFORMATION (AND PHOTOS AS I'M STILL LOOKING FOR PHOTOGRAPHS OF OUR REPORTERS!) BY THE 15TH OF EACH MONTH. DETAILS AT THE TOP OF THE COLUMN.

PW Listening & Operating Watch List

Charlie Blake M0AIJ listens & operates:
0500-0700 on 7.061MHz s.s.b. with an NRD-525 receiver & Sloping Wire antenna and is also busy with his mobile rig.

John Heys G3BDQ operates:
mainly weekends during daylight hours on the 136kHz band using 100W and an end-fed wire.

George Woods G3LPT (Suffolk) operates:
an open net on 29.630 f.m. every weekday morning except Monday at 0930 local time.

Don McLean G3NOF operates:
1030UTC Saturdays on 3.685MHz on the ISWL Net or 1030UTC Sundays on the Yeovil ARC Net on 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

John Wheeler G0IUE monitors:
29.600 n.b.f.m. every evening between 1730 and 2230UTC regardless of conditions using a Yaesu FT-920 running 100W and a 2-element TET tri-band beam antenna/half-wave vertical antenna.

Leighton Smart GW0LBI operates:
On 1.949MHz s.s.b. and around 1.820-1.836MHz c.w. on weekday evenings between 1900 and 2230UTC using a Yaesu FT-747 transceiver at 5W or 25W depending on conditions and a 60m long wire Marconi antenna.

Rob Mannion G3XFD Is QRT from home at the moment due to a pending move to a new QTH soon. However, he'll continue to try to get on h.f. (also v.h.f.) from his car. Normal service will be resumed as soon as possible!

Sean Gilbert G4UCJ operates:
around 0700 to 1100UTC and 2100 to 0000UTC seven days a week on 14MHz and 7MHz using an FT-307 and Alinco DX-70 transceivers at 3/30W output and a G5RV dipole antenna in the loft space.

DATA SCAPE

NEWS, VIEWS & PICTURES TO:

ROGER COOKE G3LDI

TEL: (01508) 570278

E-MAIL:
rcooke@g3ldi.freeserve.co.uk

PACKET: G3LDI@GB7LDI

ROGER COOKE G3LDI HAS ANOTHER BIG BUNDLE OF DATA RELATED NEWS, VIEWS AND WEB SITES FOR YOU TO LOOK AT THIS MONTH. HE TELLS YOU ALL ABOUT ISDN TRANSFER, HOW YOU CAN JOIN IN THE SEARCH FOR ALIENS AND MUCH, MUCH MORE.

Connecting to the Internet can be a very frustrating business - especially in my case. I have a V90 Modem, supposedly capable of 56Kbps and yet the best I can ever achieve is rarely more than 32Kbps - and that's on a good day!

Not only that, but my situation is compounded by the fact that I keep getting TCP errors appearing on the screen, so I can't connect, start a download and go and make a cup of tea. This would result in an immediate error appearing the minute I walked out of the room.

I have reduced the timing to three seconds so that I can issue an immediate re-start of the download. If I've already downloaded say, 65 E-mails, the whole process starts over once again and I then download them twice! Admittedly, the system does sometimes update before starting again, but this has caused a very blue haze over my computer on more than a few occasions.

DIFFICULT TO ACCESS

The Internet will become more difficult to access, the more users there are. This also happened on the Packet radio BBS systems too. Since Packet interest has declined - and it has declined since the advent of the free ISP and access to the Internet, it's now a lot easier to access the local BBS.

Mail traffic on the Satgate system is lower than a year ago and it seems a better bet now to send amateur traffic via the Amateur Radio links. Try it for yourself, this is by far the best route for Amateur Radio related topics anyway. E-mails are fine for business and lengthy personal letters that are best kept reasonably private.

The only way to overcome this obstacle is to increase the speed. This same topic has been discussed for years, with regard to the Packet Network increasing the National Trunk routes to 9k6 or better. The majority are still operating at 1.2Kbaud unfortunately.

Hopefully this new millennium will prove a starting point for a complete overhaul and some new young blood to give some impetus to a stagnant scene. I am generalising, so please don't accuse me of denigrating the efforts of those that are making some progress, I only wish it were thus over the whole of the UK.

The only way to increase speeds on the landline system is

ROGER COOKE G3LDI HAS ANOTHER BUNDLE OF DATA RELATED NEWS, VIEWS AND WEB SITES FOR YOU TO LOOK AT

ROGER COOKE G3LDI HAS MORE DATA NEWS FOR YOU THIS MONTH

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by using another system, which can give the user better service.

INTEGRATED SERVICES DIGITAL NETWORK

Integrated Services Digital Network (ISDN) is a digital, rather than an analogue, voice and data transmission architecture. It allows voice, image and data to be transmitted directly into the home or office.

Although this may not sound revolutionary, it has been available for some time now. The important thing to consider is that it reaches into your home without the need for an expensive leased line.

With ISDN, wide bandwidth digital data transmission is possible over normal copper cable, although you still need ISDN terminal adapters in order to take advantage of the system. The other advantage of this technology is that ISDN services have been standardised across the world, thanks to the **Consultative Committee for International Telegraph and Telephone (CCITT)**.

The ISDN service is considerably faster than other data transport methods - compare its 64Kbps or 128Kbps rates with the 56Kbps available (if you're lucky!) through most modern modems on the market. ISDN also lends itself to remote access.

Also, ISDN can painlessly switch between all the different network devices that exist: FAX; telephone; video and so on. **British Telecom (BT)** can probably install an ISDN line for you by doing nothing more than adding another telephone connection to your outside wall.

SEARCH FOR ALIENS?

About 500 000 users are donating their idle computer time to the search for aliens in what is claimed to be the largest distributed processing project ever. The **Seti@home (Search for extra terrestrial intelligence)** software runs as a screen saver on Windows and Macintosh machines and as a low-priority task on Unix machines.

Using the Internet, Seti@home is able to reach computers that would otherwise have wasted idle time animating toasters or displaying supermodels. With over 500 000 people participating, this makes the world's largest super computer and they are contributing about 1000 years of computing time every day.

The project analyses data from the world's biggest radio telescope at **Arecibo** in Puerto Rico. Each night the telescope scans the sky for signals, dumping 35Gb of data onto tape.

Arecibo doesn't have a high bandwidth Internet connection, so this tape is sent by post to the University of California in Berkeley, where the data is split into 0.25Mb blocks and sent out over the Internet.

Every five days for about five minutes, the client computer automatically exchanges data with the server when the user connects to the Internet. All machines receive the same size of work unit, regardless of their specification, and machines are sent new work once their batch is processed. The program consumes 20Mb of disk space.

Each work unit represents about 24 hours of screen saver time on a 233MHz computer, but computers have been taking an average of 39 hours and 26 minutes to complete a work unit. *Windows 95* machines have averaged a time as slow as 64 hours and 34 minutes and Pentium/Windows machines represent the greatest portion of the client base.

Participants come from 203 countries, including many developing nations and the top five countries are the US, the UK, Canada, Germany and Japan - the US has more participants than the other four combined. (Why do I not find this strange?). Lots of young people are interested in Seti as it appeals to their imagination.

The server specification is Solaris on Sun Sparc and the project has received further funding from **The Planetary Society**, **Fujifilm Computer Products**, **Informix** and Star Trek producers, **Paramount Pictures**. To date, there has been no government support.

So, are we alone? Try the site if you have any computer time to spare and join in the search for aliens! I just hope that when we find them, they're not like the ones that upset Sigourni Weaver!

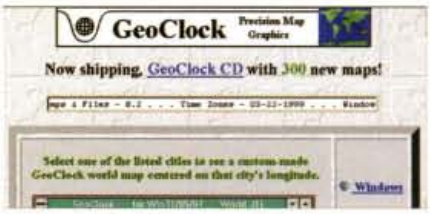

Fig. 1: The GEOCLOCK Web site can be seen here. It can be found at: www.clark.net/pub/bblake/geoclock/index.html

Fig. 2: One of the maps that you will find if you log onto the GEOCLOCK Web site.

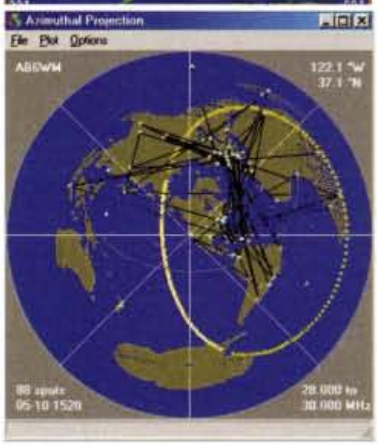

Fig. 3: The 'DX Monitor' Web site can be found at: www.benlo.com/dxmon.html

FOR LF DXers

For the DXers among you, especially those interested in l.f. band DXing, the **GEOCLOCK** Web site is a must. It has a very good grey-line screen display and there are plenty of maps to look at. If you're interested then why not take a look at: **http://home.att.net/~geoclock** (**Fig. 1 & 2** give an indication of what it's like).

Another Web site which will be of interest to the DX Radio Amateur is called 'DX Monitor' and can be found at: **www.benlo.com/dxmon.html** This program was written by a Canadian amateur, **VE3SUN**, and allows the user to monitor DX spots and is orientated toward the Internet. (**Fig. 3** shows the Web site).

Yet another site for the DXer (also Internet orientated) can be found at **http://oh2aq.kolumbus.com/dxs/** 'Kolumbus' isn't a program so much as a Web site that can be used in much the same way as the DX Cluster on the Packet network.

However, to stay on the Internet monitoring this (as you would a DX Cluster) could become an expensive option! I'm merely pointing it out as a matter of interest.

If we had free local telephone calls, it wouldn't be quite so bad! Kolumbus is an interesting site in itself, if you're after propagation forecasts, the most recent ones can be found there, plus you can go back 10 000 if you wish! It's worth a look around. The picture in **Fig. 4** gives the presentation of this site.

A PSK31 PROGRAM

If you are into PSK31 then the following could be of interest to you. Although there's a PSK31 Homepage with loads of useful information, the program I'm about to tell you about could be the one you're looking for.

Written by **UT2UZ**, it's described as the world's finest software for PSK31 (bear in mind that it was probably UT2UZ who wrote the advert!) - it's always good to compare though and it might just be better than the one you're using. Take a look at **http://users.nais.com/~jaffejim/mixwpage.htm** Again, the front page is shown in **Fig. 5**.

ANOTHER SEARCH ENGINE

Another search engine has been bought to my attention. This one is called 'March Search' and can be found at: **www.marchsearch.com** It's a new Search Engine project that you might find useful, not only to promote your own Web site, but to look up other Web sites that are already in the system.

Fig. 4: Another useful site for the DXers amongst you - the 'Kolumbus' Web site can be found at: http://oh2aq.kolumbus.com/dxs/

Fig. 5: Front page of the UT2UZ PSK31 program can be found at: http://users.nais.com/~jaffejim/mixwpage.htm

Fig. 6: Jim N2HOS' Gazette Page can be found at: http://www.n2hos.com/ digital

Search Engines in general have been called "A simple, but yet effective approach at finding Web sites" by Internet magazines in all countries. Give them a try and drop them a line if you have any ideas to improve the service or features that maybe your company or web site could offer users of March Search.

JIM N2HOS NEWSLETTER

The following information comes from a Newsletter issued by **Jim N2HOS**. If you're interested in the h.f. digital modes, then you should subscribe to Jim's Newsletter. It's free and very interesting.

Jim is always looking for contributions too so why not drop him an E-mail at: **jem@n2hos.com** or take a look at his Web site: **http://www.n2hos.com/digital** (See **Fig. 6** for Jim's Gazette Page).

Taka JA3BN sends along holiday and Y2K greetings and reminds all of us that he still hangs out at 21065.5MHz awaiting the next Clover call. He also asks that I remind you that you can set up a sked by E-mailing: **ja3bn@mb.infoweb.ne.jp**

I have had very little feedback regarding Clover, so I guess it is a minor interest, probably due to the expense involved with buying a Clover board for the PC. Let me know if you're active on that mode.

Walter DK4RCK has uploaded V1.35 of RCKRTTY. The latest version includes the ARRL RTTY Roundup. You can download it from: **http://home.t-online.de/home/dl4rck/**

NEWS FROM BARTG

Now for some news from the **British Amateur Radio Teledata Group (BARTG)**. They now have a Freepost address for: enquiries; subs from new members and subs from existing members. The Freepost address is: **BARTG, FREEPOST NEA8763, Rotherham S66 7BR**.

What's happening is that the Winter issue of *Datacom* will include a questionnaire and to encourage as many members as possible to return the questionnaire it was decided to cover the cost (**for UK members**) of returning the questionnaire to BARTG. This meant either sticking stamps on all the envelopes or opening a Freepost address - the latter was chosen. It will probably work out cheaper than stamping all the envelopes.

The Freepost address is actually linked to the BARTG membership secretary and that's why it can be used for things that would've been posted to the membership secretary (i.e. subs and enquiries). **It's not available for any other BARTG correspondence** because this would involve forwarding and extra costs.

THAT'S ALL FOR NOW

Well, that's all for now. Hope to catch you with the next 'Data Scape' in the April issue. Don't forget to keep on sending me anything you think that other readers might like to know about.

UNTIL NEXT MONTH ...

Roger G3LDI

Web Watch

GEOCLOCK Web site: http://home.att.net/~geoclock
DX Monitor Web site: www.benlo.com/dxmon.html
Kolumbus: http://oh2aq.kolumbus.com/dxs/
UT2UZ PSK31 program: http://users.nais.com/~jaffejim/mixwpage.htm
'March Search': www.marchsearch.com
Jim N2HOS' Web site: http://www.n2hos.com/digital

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STATION APPROACH
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DORSET BH18 8PW

E-MAIL:
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PETER SHORE BRINGS YOU LOTS OF FREQUENCY NEWS THIS MONTH, AS WELL AS SOME GOOD NEWS FROM BOTH RADIO CANADA INTERNATIONAL AND RADIO NEW ZEALAND INTERNATIONAL.

Good news from **Radio Canada International (RCI)** which inaugurated new short wave transmitters in November last year. This came about following an injection of more than C$15 million into the station by Canada's Heritage Department.

The new transmitters are all capable of transmitting the new digital short wave systems that are being developed by the Digital Radio Mondiale consortium. The RCI's Sackville site is on Canada's Atlantic coast and boasts three 100kW and five 250kW senders. (See **Fig. 1**).

The current schedule for English to Europe from RCI is (all times are in UTC):
0600-0630 on 5.960, 6.090, 6.150, 9.670, 9.780, 11.710 (not weekends), 11.905, 13.690MHz, (not weekends), 15.325MHz (not weekends);
1430-1500 on 11.740 and 17.820MHz;
2100-2200 on 5.995, 7.235, 9.770, 9.805, 11.945, 13.650, 13.690, 15.325 and 17.820MHz;
2200-2300 on 5.995, 7.235, 9.805, 11.705 (to 2230), 13.690 and 15.325MHz.

But not all the news from Canada is quite so good. On December 30th, CBC technical staff went on strike which affected the output of RCI in some programme streams, including the short wave broadcasts. As this edition of *PW* goes to press, the dispute continues.

NEW MW SERVICE

A new medium wave (m.w.) service for the Baltic States went on the air on January 1st 2000. **Radio Baltic Waves** uses a 50kW transmitter in Vilnius on 612kHz and carries the programmes of **Polish Radio Warsaw**, **Radio**

PETER SHORE HAS LOADS OF FREQUENCY NEWS FOR ALL YOU LISTENING FANS OUT THERE THIS MONTH!

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RadioScene

Fig. 1: Radio Canada International's new short wave transmitters.

Fig. 2: Voice Of Tibet illustration.

Liberty and a number of regional stations. It's planned to have up to eight hours a day of this mix of international and regional programmes - all in the Belarussian language - on the air by the end of this year. The service is currently on between 0400 and 0600UTC and 1800 to 2000UTC.

As we go to press, there's still no sign of the return of **Radio Luxembourg** on 208 metres - or 1440kHz in new money! I reported late last year that a British media group is resurrecting 'Luxie'.

Despite the involvement of CLT-UFA (the giant media group that owns the Luxembourg station and transmitters), the English-language service is still not on the air. Instead there is a relay of one of RTL's German-language services. I'll keep you posted on developments.

There are reports from Cuba that programmes of **China Radio International (CRI)** are now being broadcast on short wave from the Caribbean island to listeners in the Americas. It's suggested that the short wave relays from Cuba have been on the air since May last year in English, Chinese, Portuguese and Spanish.

The rather nicely revamped CRI Web site: **www.cri.com.cn/english** gives frequencies, but doesn't suggest the locations of each transmission. Here's the current schedule for English to Europe (all times are in UTC):
2000-2100 on 5.965 and 9.535MHz;
2100-2130 on 7.150MHz;
2100-2200 on 5.965 and 9.535MHz;
2200-2300 on 7.170MHz.

English to North America:
0300-0400 on 9.690MHz
0400-0500 on 9.730MHz
0500-0600 on 9.560MHz
1400-1600 on 7.405MHz

Fig. 3: Welsh Radio International (WRI) logo.

Try also the Portuguese language service:
0000-0030 on 11.85MHz;
0030-0100 on 11.85, 11.68 and 7.245MHz;
2200-2230 on 7.245 and 5.965MHz.

There's been a focus on Tibet and China following the escape of the Karmapa. What you may not know is that there is a clandestine station broadcasting from studios in Europe and India to Tibet. The **Voice of Tibet** (see **Fig. 2**) is on the air daily from transmitters in Central Asia (all times are in UTC):
0100-0145 on 9.920MHz;
1215-1300 on 9.910 and 15.650MHz;
2315-0000 on 9.920MHz.

MERLIN COMMUNICATIONS

Merlin Communications has added some new once a week transmissions to its Network One. On Fridays and Saturdays, **Wales Radio International (WRI)** (see **Fig. 3**) has a half-hour programme called 'Celtic Notes'.

The station promotes Welsh culture and tourism and is running a year-long competition for a trip to Wales. It's on the air at 2130UTC Friday on 6.01MHz, repeated on Saturday at 0300 on 9.735 and at 1130UTC on 17.65MHz.

On Friday there is a 60 minute show produced by the Stafford Broadcasting Society called 'Imagination'. It airs at 1900UTC on 6.01MHz.

SAFER HANDS

The future of **Radio New Zealand International (RNZI)** seems to be in safer hands following the elections last year. The country's Foreign Affairs Minister was reported by a newspaper in the Cook Islands as saying that the government is aware "of the importance of the services of Radio New Zealand and TV New Zealand to the Cook Islands".

The Minister went on to say that "in the new budget round there will be consideration of the international services of Radio New Zealand and additional funding they are seeking".

Meanwhile, RNZI is on the air (all times are in UTC):
1850-0606 on 17.675MHz;
0606-1005 on 17.690MHz;
1105-1500 on 6.105MHz;
1500-1650 on 6.145MHz;
and on weekdays between 1650-1850 on 17.675MHz.

OTHER FREQUENCY NEWS

Radio Korea International in Seoul broadcasts in English at these times (All times are in UTC):
0200-0300 on 7.275, 11.725, 11.810 and 15.575MHz;
0800-0900 on 9.570, 13.670MHz;
1130-1200 on 9.650MHz;
1300-1400 on 9.570, 9.640 and 13.670MHz;
1600-1700 on 5.975, 9.515 and 9.870MHz;
1900-2000 on 5.975 and 7.275MHz;
2100-2200 on 6.480 (to 2130)MHz;
2200-2230 on 3.980MHz.

All India Radio is on the air with English at:
0000-0045 on 7.410, 9.705, 9.950, 11.620 and 13.625MHz;
1000-1100 on 11.585, 13.700, 15.020 and 17.485MHz;
1330-1500 on 9.545, 11.620 and 13.710MHz;
1745-1945 on 7.410, 9.950, 11.620, 11.935, 13.750, 15.075 and 15.200MHz;
2045-2230 on 7.150, 7.410, 9.650, 9.910, 9.950, 11.620 and 11.715MHz;
2245-2359 on 7.410, 9.705, 9.950, 11.620 and 13.625MHz.

Radio Telefís Éirann (RTE) in Dublin, Ireland, has daily English programmes on short wave (all times are in UTC):
0130-0200 on 6.155MHz;
1000-1030 on 11.740MHz;
1800-1830 on 15.315MHz;
1830-1900 on 13.640 and 21.630MHz.

That's all for this month. Don't forget that, with the time changes at the end of the month, frequencies will change and quite a few times of broadcasts will alter, too. This column will keep you up-to-date with the changes starting next month.

UNTIL THEN, HAPPY LISTENING AND AS ONE OF THE WELL KNOWN DX PROGRAMME HOSTS USED TO SAY, KEEP YOUR RADIO ON AND YOUR MIND OPEN!

73 Peter!

Web Watch

China Radio International: www.cri.com.cn/english

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CHRIS EDMONDSON VK3CE IS BACK THIS MONTH TO TALK ABOUT THE FUTURE OF AMATEUR RADIO

RadioScene

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YES, CHRIS EDMONDSON VK3CE IS BACK THIS MONTH WITH HIS QUARTERLY LOOK AT AMATEUR RADIO 'DOWN UNDER'. THIS MONTH HE DISCUSSES THE FUTURE OF AMATEUR RADIO - NOT JUST FOR AUSTRALIA, BUT FOR THE ENTIRE WORLD!

'G'Day' once again from that bloke 'Down Under'. They call me (or at least they call my column!) the 'Aussie Oracle' and I don't know whether to be flattered or just get a big head and be done with it. It's up to me to tell you lot in draughty 'Old Blighty' all about what's happening down here in sunny 'Oz' ... and when you consider that, from my perspective, you're all standing on your heads - you'll understand what a tough assignment that can be!

Now that the 'Y2K' business is well behind us, we can finally see that the clocks are still ticking along nicely, the computers are still computing, the radios are still radioing, the airliners are still flying, and the banks are still ripping us off blind. So what's new?

Some of the sillier predictions for the mere tick of a clock from December 31 1999 to January 1 2000 would have seen us all cowering in 'nuke-proof' bomb shelters, waiting for the inevitable slightly upset reactions as banks closed down, our money lost forever, with militant mobs ruling the streets, sidearms drawn, killing all womenfolk and babies. For pity's sake! What tommyrot!

Some poor misguided people even moved out of their high-rise apartment blocks on Queensland's balmy Gold Coast because they just knew there would be a cataclysmic tsunami tidal wave thing roaring in at the stroke of midnight to wash them all away. Or maybe just wash them, judging by the way some of them smell. Are these people incapable of rational thought?

The family and I stood quietly on our veranda, high on top of the mountains above the Gold Coast (just in case, you understand!) and watched as the skyline all along the coast and over Brisbane erupted in a vivid display of colour which simply took the breath away. The whole thing was quite marvellous - good practice for the real turn of the millennium in a scant few months! Sad to report, the surf glistening under the near-full moon looked pretty normal to us.

WHAT OF RADIO?

But what of radio? The interest which draws us all together is still in its infancy, barely into its second century. One can but wonder at what marvels the 21st Century will reveal to us.

I, for one, want to see as much of it as possible! But I'm sure that radio will also continue to entertain, enthral and fascinate the children of our children, as it did the parents of our parents - let's fervently hope that the decisions our regulators make at the World Radio Conferences of the next few years are ones that cement this fabulous hobby's place in the world of the 21st Century.

Fig. 1: Chris Edmondson VK3CE in the flesh.

Just before we get to the matter at hand, here are a few words from an Editorial I wrote a couple of issues ago in the Australian magazine, ***Radio and Communications***. I share these thoughts with you, because I was more than a little surprised by many Australian readers' reaction to them.

I received more letters about this one Editorial than all of the Editorials before that one, combined! As I've been writing them for more than 13 years now, that's quite a few ...

It's four o'clock in the morning as I write. I've just been standing out on the front veranda for a solid half hour or so, my trusty little Sony IC-SW1 cassette-sized portable radio in my hand, tuning around the short wave bands - with its little two-foot whip, I've been listening to warbling little signals from around the globe.

I started on the a.m. broadcast band, quickly got bored of that and moved up in frequency, excitedly searching the bands - just as I did when I was an eight year-old in front of my grandfather's impressive gramophone ... now so many years ago!

Some of the signals are strange-sounding data signals which make me curious. What are they, and where do they come from? Some of them are voices, talking in languages I'll never understand and some of the signals carry music the likes of which you'd never hear on a broadcast station in this country.

You know, I have a great big radio set inside the house and impressive antennas to make sure the signals I seek will be loud, clear and strong. But, more often than you might think, I'll quietly wander outside and listen on the portable, because it reminds me so much of the sounds which so thrilled me as an impressionable seven or eight year-old - so many of the sounds are the very same ones I listened to some 40-odd years ago.

IT'S MAGIC!

It's magic, you know. The wireless still intrigues, still fascinates. So many people these days think the radio has lost its magic, has lost touch with the modern day - I reckon they're wrong. The children of today don't get 'the radio bug' because they're too busy having computers rammed down their necks.

Hey, don't get me wrong, computers can be fun too. But where is the sense of challenge and adventure? Where is the boost to the imagination? I used to dream about those wireless signals I tuned to as a child. I'd listen to the voices from the far-off places and imagine I was there too, visiting the bustling cities and mingling with those so-foreign cultures.

Radio hasn't changed much over the years. Oh sure, the gadgets have changed - my little Sony receiver would have been a completely impossible dream when I was a child. But the fascination is still there and the possibilities and opportunities are exactly the same.

I typed a pretty cross E-mail earlier tonight. Accusing someone who should know better of having lost the vision, of being so buried in the politics of his radio association that he could no longer see the fun that is so clearly there for all to share in.

That's the magic of radio, you know. Its very randomness, whether your radio tunes the broadcast bands or voice bands, the air bands or commercial two-way networks. You can never be quite sure what's going to happen next.

If you worry about the future of our hobby, why not quietly take your child out onto the patio tonight, a small receiver in your hand and share in a little magic with them. See what you can find. Perhaps it will be inspiration and, just maybe, a spark which will be a happy memory that lasts across a lifetime.

Okay, enough of the eulogising. Happy New Year to you all and let's talk radio once more. Over the past year or so, we've had a couple of quick looks at the radio scene in 'Oz', primarily from the amateur front, but also from the perspective of a land still heavily dependant upon h.f. radio for 'normal' outback communications.

MORSE CODE

But, this time, I feel compelled to discuss a topic which affects Radio Amateurs around the world - and which, dare I suggest, is poised to shape the future of the hobby as we know it. I refer, of course, to the Morse Code.

As will doubtless have been reported elsewhere in these pages, probably last month, the USA's **Federal Communications Commission**, the **FCC**, announced on December 31 last year that all amateur Morse examinations conducted after April 15 this year would be at the 'Novice' speed of five words per minute (wpm) - the 13 and 20wpm tests are gone forever.

Australia now faces a tough decision. First came the UK, now the USA. I understand Germany and Japan are considering similar steps. Surely, with such prominent and prestigious leads to follow,

Australia must surely be next!

I try not to wear my heart on my sleeve when discussing the issues of the day, but I really do feel quite strongly about this one. I believe that Morse now threatens the hobby as we know it and it really is that simple.

Over the past few years I've heard the locals use precisely the same arguments as you would have heard on your side of the globe. "Morse keeps the idiots out" - piffle. There are plenty of unpleasant people with Morse qualifications - and lots of very lovely people without them.

Next? "It's the King of Modes". Yes, it may well be, but is it relevant to the modern radio user who doesn't intend to use it? And so the argument goes on.

The way my magazine (*Radio and Communications*) has tried to explain itself on this subject is simple. Morse is a challenge - I know many people who avoid voice communications whenever they can, preferring the key to the microphone.

Gee, how I wish I had the knack with the key! How jealous I am of the people who can effortlessly pound out those 25wpm QSOs. How hard I worked to get to the elusive 10wpm required of a full call licence holder in this country!

Maybe you could argue that the magic of Morse has always eluded me. Perhaps, but even if it had clicked for me, I rather feel that, being first and foremost a pragmatist, I would have the same viewpoint today anyway.

Please, someone, tell me why you would need a test in Morse to prove you are a suitable person to operate an h.f. transceiver? Am I a better or more appropriate h.f. operator than my mate with a no-code ticket? I really don't think so.

Fig. 2: Front cover of Chris' magazine: *Radio and Communications.*

More to the point, I'm very frustrated to see so many potential 'new chums' turn away from the hobby before completing a qualification because they simply don't want to learn the Morse.

These amateurs may want nothing more than to rag-chew on top band a.m. with the locals, or work their 100 countries, or play with 300 baud h.f. Packet radio because their 56K international Internet hook-ups are boring, or even try a spot of h.f. mobile - and they simply can't do any of these things because the code test stands in their way.

Some of them, of course, put frustration aside and enter the road to their Amateur Radio licence. They learn Morse anyway then never, ever use it again.

Other equally enthusiastic candidates see Morse as a mindless and archaic obstacle, sell their new radios and return to the anonymous safety, simplicity and sterility of the Internet - and there, maddeningly, goes another prospective amateur.

We can't go on like this, you know. It simply doesn't matter what our hobby was like 40 years ago. This is the year 2000 and Amateur Radio is at the cross-roads, under a greater and more sinister threat than ever before.

The mindless simplicity of the Internet, allied with a school system which sees a computer on every desk, means that Amateur Radio is no longer the logical outlet for youngsters with a curiosity for things electronic and the 'proving ground' for so many technical 'boffins' is slowly but surely drying up.

BORN OF AMATEUR RADIO

So many of the innovations and discoveries born of Amateur Radio are being left to commercial design houses these days. The experimental fields and focus formerly so strongly identified with 'Amateur' Radio are now the domain of product developers eager to find new markets.

Maybe we need to look at more than just the Morse Code and its place in year 2000 hobby radio. We need to think about our role in the fraternity, about how we view our national lobby and representation bodies and, more than ever before, about how we can do something to prolong its usefulness and prevent its eventual demise.

Maybe this isn't the upbeat and fun look at radio in Australia that I hoped to pen, but this column is, above all, about the issues which confront us and surely our future is one such issue! The fact that these comments might apply equally in Zaire as they do in Australia only makes the message a more important one to heed.

We in 'Oz' need to think about our role in radio, about how we can foster new interest in the hobby and to try to forecast what our lot might be in another 20 years. Maybe next time we can go for another tour of Australian radio.

This time is over, I'm afraid - for I hear Rob rushing over with the Editorial red pencil and sharpened scissors and know that it's time for me to hop back into my pouch (kangaroo style!) for another three months or so.

YOUR FEEDBACK AND COMMENTS ARE WELCOME AS ALWAYS TO ME, AT THE ADDRESS AT THE TOP OF THE COLUMN. UNTIL THE NEXT TIME MY COLUMN'S IN *PRACTICAL WIRELESS* ...

73 Chris

MAIL ORDER TIPS!

Many readers will have noticed how the battle for their custom has become more intense as the popularity of the hobby has declined. Fewer amateurs buying less equipment means there are now some great deals to be had but it also means that some dealers may try to cut corners when it comes to honouring their commitments. Also, as the real cost of Amateur Radio equipment has fallen and the competition for your custom has increased, some of the smaller shops have either gone out of business or been swallowed up by the bigger companies. In some areas, it's almost impossible to find a local shop and now the trend is towards mail order purchasing.

This, in itself, is not a bad thing but it does mean you'll probably be buying from a shop you've never visited and from a salesperson you've never met. So, how do you know who to trust with your money? You could go on air and ask about the dealer you're thinking about buying from, but the risk is that there may be one or two vociferous individuals who will be happy to tell the world about their grievances while the majority of satisfied customers just keep quiet. The same is true of the Internet. The various radio related newsgroups are a good place to ask but, again, you may not get a representative (or honest) selection of answers.

The truth is, there is no real way of telling beforehand how your transaction will be handled, how well the equipment will perform or whether it will go wrong. All you can do is to take reasonable precautions before you buy and know what to do if the worst happens. This is where we aim to help. First of all, take a look at the Top Ten Tips in the Buyer's Guide box. If you follow those guidelines before you buy, you'll have minimised the chance of something unforeseen cropping up and you'll be prepared should the worst happen and you have to return the goods.

THE FULL VERSION OF THIS SERVICE, ALONG WITH A PERSONAL ORDER FORM, APPEARS IN THE FEBRUARY ISSUE OF PRACTICAL WIRELESS.

Buyers Guide

Top 10 Tips

1: Telephone first to confirm the price and details are as in the advertisement. Dealers often have to send in copy up to 8 weeks before the magazine is published and prices and availability can change in that time.

2: Ask if it's a parallel/grey import or if it came from the authorised UK importer.

3: Ask if it is the full UK specification and if it has CE approval.

4: Ask about extra charges (delivery, VAT etc.) and find out the final, all-inclusive price.

5: Ask about their return/refund/repair policy for faulty goods and if they have a restocking fee for the return of non-faulty items.

6: Ask for a written quotation if it's a large order.

7: Make a note of all calls and who you spoke to and keep copies of all paperwork.

8: Pay by personal credit card whenever possible as the card company has insurance to cover all transactions above £100 and you will almost certainly get your money back from them should something go wrong.

9: Check everything as soon as it arrives. Open all the boxes and check that you have been sent everything exactly as ordered. If there is a problem, contact the supplier immediately.

10: If a problem develops later, write the supplier a concise and accurate letter outlining the problem and asking them how they intend to rectify it. If that fails, write to us with copies of all relevant paperwork and we'll take it from there.

Book Store

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

BOOK of the MONTH

Solid State Design For The Radio Amateur

This month's 'Book Of The Month' comes from the **American Radio Relay League (ARRL)** and is written by none other than **Wes Hayward W7ZOI** and **Doug DeMaw W1FB!**

Solid State Design For The Radio Amateur claims to be "... chock full of good, basic information - circuit designs and their applications and descriptions of receivers, transmitters, power supplies and test equipment". Not only this, but it also claims that some of the information contained in this book cannot be found in any other publications! The circuits in this book are very clear and it also contains other diagrams and pictures to illustrate the various chapters.

The usual price of *Solid State Design For The Radio Amateur* is £11.50 plus P&P, however, our special price this month is **£10 including P&P** (UK only overseas P&P rates on application). Order your copy today!

So, don't waste any time! Offer closes 31st March 2000!

To order please either use the form on page 98 or call the Credit Card Hotline on (01202) 659930 and quote *PW* 3.

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Abc AIRLINE LIVERIES 4th Edition. Gunter Endres	144	£9.99
Abc BRITISH AIRPORTS (6th Edition) A. Wright	112	£8.99
Abc CIVIL AIRLINER RECOGNITION 6th Edition. Peter R. March	128	£9.99
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AIR BAND RADIO HANDBOOK 6th Edition. David J. Smith.	192	£9.99
AIR TRAFFIC CONTROL 7th Edition. Graham Duke.	112	£8.99
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UNDERSTANDING ACARS 3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn.	80	£9.95
WORLD AIRLINE FLEET & SELCAL DIRECTORY	300	£16.00
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RADIO DATA CODE MANUAL. 16th Edition. Joerg Klingenfuss	788	£30.00
RADIOTELEX MESSAGES (25 Years of Monitoring Global Teleprinter & Data Communications, 1st Edition	568	£20.00

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GUIDE TO DXTV. Keith Hamer & Garry Smith.	36	£3.95
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RADIO LISTENERS GUIDE 2000	128	£4.95
SHORTWAVE FREQUENCY GUIDE 2000. Joerg Klingenfuss	564	£23.00
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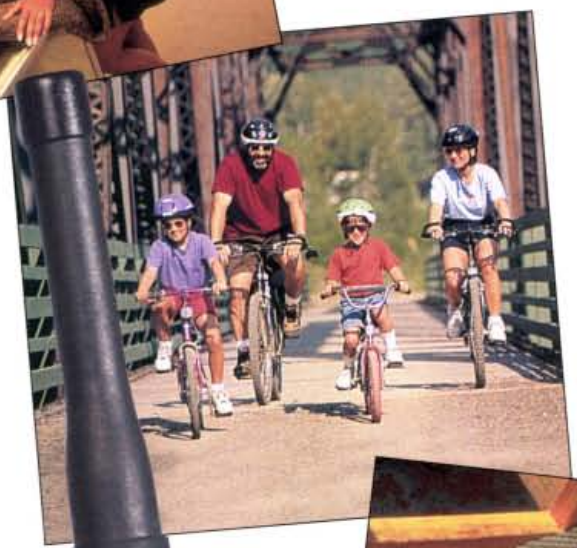

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An HF Masterpiece, Combining the Best of Digital and RF design technology. The FT-1000MP.

Specifications

- EDSP (Enhanced Digital Signal Processing)
- Shuttle-jog Rapid Tuning Enhancement
- Directional Tuning Scale for CW/Digital mode and clarifier offset display
- Dual In-Band Receive w/Separate S-Meters
- Selectable Antenna Jacks
- Collins SSB Mechanical Filter built-in, 500 Hz CW Collins filter plug-in, optional
- Selectable Cascaded Crystal and Mechanical IF Filtering (2nd and 3rd IF Filters)
- User-Programmable Tuning Steps w/0.625 Hz High Resolution Low-Noise DDS Circuit
- Custom Feature Set-up via New Menu System
- Adjustable TX Output Power: 5-100W(5-25W AM)
- True Base Station: Both 100-117 or 200-234 ± VAC 10% 50/60 Hz and 13.5 VDC Power Inputs

Blending digital and RF technology, the FT-1000MP features a Yaesu exclusive: Enhanced Digital Signal Processing (EDSP). Beginning on the receive side with Yaesu's industry-standard high-intercept front end design, the RF signal is then fed to the IF stages, where an impressive array of 8.2 MHz and 455 kHz IF filters (including a built-in Collins SSB Mechanical Filter) establish the tight shape factor so important in obtaining high dynamic range and low noise figure. Finally, the EDSP system provides specially-designed filter selections and response contours for maximum intelligence recovery.

Only with this combination of EDSP, independently selectable 8.2 MHz and 455 kHz IF filters, and a low-noise DDS local oscillator system can receiver performance without compromise be obtained. You can customize your FT-1000MP by choosing from 2.0 kHz, 500 Hz, and 250 Hz optional, cascaded IF filters, then zero in on weak signals using Yaesu's exclusive Shuttle-jog Rapid Tuning Enhancement and high-resolution (0.625 Hz) DDS VFO. Without question, the FT-1000MP is the most technologically advanced HF rig today.

EDSP operates in both transmit *and* receive modes. On receive, the EDSP produces enhanced signal-to-noise ratio and significantly improved intelligence recovery during difficult situations involving noise and/or interference. The result of hundreds of hours of laboratory and real-world experimentation, EDSP's 4 preset random noise reduction protocols and 4 digital filtering selections are controlled by easy-to-use concentric controls on the front panel of the transceiver. High, low, and mid-range cuts for voice work are teamed with razor-sharp CW bandpass filters and an automatic notch filter which identifies and attenuates undesired carriers or heterodynes. Also operational in the transmit mode, EDSP provides 4 performance-enhancement pattern selections for different operating circumstances, ensuring best readability of *your* signal on the other end of the path.

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