practical
Wireless
JULY 1997 £2.20

IN THIS ISSUE - ANTENNAS IN ACTION! - PAGES PACKED WITH IDEAS

Reviewed:
Kenwood's Test Bench Trio
The Icom IC-207H Dual-Band Mobile Transceiver

Feature:
Longleat Rally - 40 Years & Counting!

Chip In & Build A Shack Desk

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Kenwood Test Equipment

THE UK'S BEST SELLING MAGAZINE FOR AMATEUR RADIO ENTHUSIASTS

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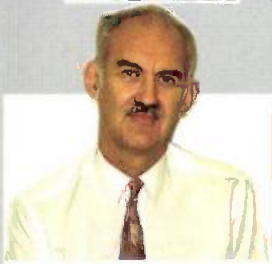

Part Exchange Welcome

W&S Extended Warranty Now Available

5 YEARS FROM JUST £58 Based on £300 item

See our new Web site: http://www.monitor.co.uk

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Yaesu FT-50R 2m/70cms

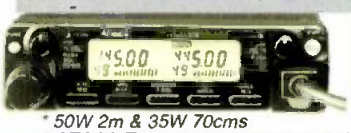
OFFER W&S £249

Lowest UK Price!

- Wideband Rx (AM Airband)
- FM Broadcast receive
- CTCSS & 1750Hz
- 112 Alphanumeric Memories
- Dual Watch - Military rated
- 5W from 12v DC input
- Ni-cads and AC Charger
- One of our top 5 sellers!

CT-30 Mic Adaptor ------ £9.00
CSC-69 Case (FNB-40 batt) - £15.00

ALINCO DR-605 2m & 70cms



W&S £369

- 50W 2m & 35W 70cms
- CTCSS Encode plus 1750Hz tone burst
- 100 Memories, 9800 bps for packet

ALINCO DR-150E 2m FM

~~£359~~ Save £90!

W&S £269

- 100 memories
- 50 / 25 / 10W
- CTCSS encode
- 1750Hz tone
- Wideband Rx
- Time out etc.

Latest Alinco DX-70T

W&S £669

- HF 100W
- 6m 10W
- SSB CW FM AM
- Remote head
- CW filter
- Narrow filters

ALINCO DJ-180EB 2m FM

- 144 - 148MHz
- Rx 130 - 170MHz
- 6 Channel Steps
- 10 Memories
- 1750Hz tone
- 5W on 12V DC
- Rugged design
- Ni-cads
- AC Charger
- Limited stocks of this model

W&S £149

Lowest UK Price!

DJ-G5 2m & 70cm

W&S £269

- Up to 5W output
- CTCSS & DTMF
- 1750Hz tone
- Electronic controls
- 100 Memories
- AM airband
- Channel scope
- Programmable steps
- Extended receive
- Full scanning
- Ni-cads and charger

ADI Mobile FM Rigs

With CTCSS

Our best selling 2m Mobile

W&S £249

AR-146 2m 50W

Both rigs feature:

- 3 Power levels - Wideband receive
- 40 Memories plus call channel
- 7 Programmable steps
- Channel or frequency display
- The best sensitivity in the business
- Keypad mic and mounting kit

With CTCSS

AR-446 70cm 35W

W&S £269

3W Novice version available

ADI AT-200 2m FM Handy

W&S £129

- 2m FM Handy
- 2.5W output
- 5W on 13.8v
- 1750Hz tone
- Illuminated keypad
- Ultra sensitive
- Wideband Rx
- 20 memories
- Keypad entry
- DTMF
- Uses AA cells

Lowest UK Price!

This has proved to be our mosr reliable handheld. It has a very sensitive receiver and is built to professional standards.

ADI AT-400 70cm FM Handy

W&S £169

- 70cm FM Handy
- 2W output
- 5W on 13.8v
- 1750Hz tone
- Illuminated keypad
- Ultra sensitive
- Wideband Rx
- 20 memories
- Keypad entry
- DTMF
- Uses AA cells

The Novice Rig

This has become the standard radio for Novice hams. Its sensitive, cost effective and was featured on Anglia TV last month

ADI AT-600D Dual Bander

2M & 70cms + + +

W&S £279

- Airband Receive
- Switched FM/AM
- Alphanumeric
- CTCSS Auto Read
- 29 user programmes
- Extended Receive

No 1 dualbander - here's a few things the expensive competition can't offer.

AT-600 offers Airband AM Receive
Gives you the ability to monitor airband signals throughout the entire AM VHF airband.

AT-600 offers Alphanumeric Display
You have the choice of naming each memory channel and switching between name and frequency

AT-600 offers CTCSS Auto Read
The AT-600 can actually read the CTCSS tones from an unknown repeater and download for immediate use.

AT-600 offers 29 User Programmes
Now you can tailor the radio to operate exactly as you wish - the possibilities are endless.

AT-600 offers Extended Receive (AM/FM)
Key in a code to get 108 - 199MHz, 350 - 400MHz, 400 - 500MHz and 850 - 999MHz.

- 2m & 70cms tcv.
- 5W on 13.8V
- Full duplex
- AM/FM Rx
- Rx up to 990MHz
- DTMF fitted
- CTCSS fitted
- 1750Hz tone
- Auto power off
- Batt. volt meter
- Illiminated keypad
- Ni-cad & charger

WS-1000 Amazing Scanner

July Special £229.95

- World's smallest scanner
- FM, WFM, & AM
- 500kHz - 1300MHz
- Fast scanning speed
- Clear LCD readout
- 400 Memories
- Super sensitivity
- Good strong signal handling
- Runs from just 2 x AA cells
- Battery saving mode

UK's tope dealer for YAESY, KENWOOD & ICOM

W&S

VHF & UHF Band Pass Filters

2m & 70cm Digital Communications

NO MORE PAGER PROBLEMS
We guarantee this will kill all QRM caused by strong out of band signals - - - - or your money back!

DCI-145	£89.95	DCI-435	£119.95
Passband:	144 - 146MHz	Passband:	430 - 440MHz
Loss:	Less than 1 dB	Loss:	Less than 1 dB
Selectivity:	-68dB at 136MHz - 55dB at 155MHz	Selectivity:	-47dB at 215MHz - 50dB at 455MHz
Power:	200 Watts	Power:	200 Watts

KENWOOD HF RIGS

NEW TS-570

W&S £1289

Filters SSB & CW £57.95 each.

Kenwood 2m All Mode

Save £300

W&S £699

TM-255E

NEW KENWOOD RIG

W&S £585

TM-V7E

- 144 & 430MHz 50/35W
- Dual Rx on same band!
- 280 Memories
- Detachable front head
- CTCSS & 1750Hz Tone
- Large clear display

W-MM1 Multimode Modem

WATSON

W&S £69.95

NEW

- Packet, AMTOR, CW
- SSTV, Fax, RTTY
- NAVTEX, SYNOP
- Transmit and receive
- Needs PC 286 or better
- Includes software
- No external power required
- Connects to RS-232

Yaesu FT-8100 2m/70cm

Yaesu's new FT-8100 features a detachable head unit and builds on the FT-8000 design. Probably the best value in dual band mobiles

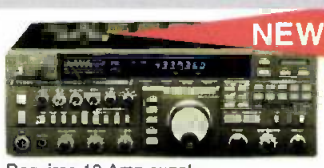
W&S £429

2YR Warranty

- 50/35W
- 2m/70cm
- Detachable head
- Rx 110-550MHz 750-1330MHz
- 208 Memories
- Cross band repeat
- Dual VHF/VHF Rx
- Dual UHF/UHF Rx
- Auto memory load
- DC voltage meter
- 1200/9600 packet
- Prog. mic keys
- Windows prog.

Yaesu FT-736DC 2m/70cm

NEW



W&S £1199*

Offers even better value.

Requires 10 Amp supply.

* Price subject to confirmation

We are now ISO 9002 Registered

ISO 9002 REGISTERED FIRM

At Waters and Stanton we are always working towards improving our service to customers. This means running an efficient and well organised company with a professional service department. We are the first UK amateur radio retailer to achieve ISO 9002. So when our competitors refer to themselves as "UK's number one" or "Europe's leading dealer," ask yourself, who's kidding who?

YAESU PRICES DOWN
Special July OFFERS

NEW Yaesu FT-920

Price Match

W&S £1449

The new FT-920 has been released and offers some great features at a great price. 1.8MHz to 54MHz plus wideband receive, 33 MPS Digital signal processor, Digital IF shift, Auto notch filter, Dual VFOs, 100 Memories, Band Stacking VFO system. Break-in CW with electronic keyer, TNC interfacing, Digital voice recorder, 13.8v DC operation.

Yaesu FT-1000MP

Price Match

W&S £1979

5 Year Warranty on FT-1000MPs £115

FT-1000MP	~~£2849~~	£2129
FT-1000MPDC	£2599	£1979

Yaesu FT-8000 2m & 70cms

W7S Exclusive

W&S £399

- 50 & 35W
- CTCSS &1750Hz
- 108 memories
- 9600 Packet
- Airband AM Receive
- Auto repeater load

Yaesu FT-840 HF Rig

W&S £699

PRICE DOWN

We've purchased a quantity at this special price. You won't get a base station rig any cheaper!

ALINCO DR-MO6 6M Mobile

UK Repeater Ready

- 10W FM Output
- CTCSS Encode
- 100 Memories
- LCD clear readout
- Mic. mobile mount etc

£247

NEW IC-706 Mk II ~~£1195~~

Free 24 hour delivery

W&S £999

Price Match!

The new IC-706 has arrived. Now with 25W on 2m and a much improved front end. It's miles better than the competition. Get the rig that offers you everything from 1.8MHz to 146MHz. Our own personal tests have shown that this rig just blows away the cheaper alternatives.

The choice: *Do you want a cheap rig or the Best?*

- 160 - 2m
- SSB - CW - FM - AM
- 100W inc 6m
- 25W on 2m
- Improved front-end
- Superb performance
- Large LCD display
- Another winner from Icom

ICOM IC-207H 2m/70cm Mobile

W&S £389.95

- 2m & 70cm
- 50W / 30W
- Detachable head
- Packet 9600 bps ready
- 180 Memory channels
- CTCSS & 1750Hz tone

ICOM IC-756 HF Rig

Price Match

W&S £1849

- 100W of pure Magic
- 160 - 6M
- SSB - CW - AM -FM
- Spectrum display
- Auto ATU
- Superb DSP built-in
- CW Memory keyer
- 100% duty cycle
- Keypad entry option
- DXers choice in the USA

ICOM IC-821H 2m/70cm

Price Match

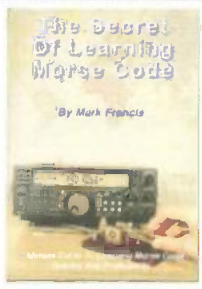
W&S £1349

- 2m/70cm All Mode
- 45/40W adjustable
- Full duplex
- Satellite features
- 160 Memories
- 9600bps capability
- Electronic keyer
- IF shift, noise blanker

Secret of Learning Morse

£6.95

Back in stock once more, this unique book takes you through the whole process of learning Morse code. Acknowledged as the most definitive book on the subject and recommended by numerous Morse tutors



TONNA Antennas - Perform!

Balun matched excellent gain and VSWR. The favourate of the contest groups. Mount horizontal or vertical.

July Offer:
20505 5 El 50MHz
~~£86.95~~ £79 carr. £4

Just a small selection!

2 Metres			20921	21 El. 18dB	£69.95
20804	4 El. 8dB	£44.95	23 cms		
20809	9 El. 13dB	£52.95	20623	23 EL 18dB	£51.95
20811	11 El. 14dB	£79.95	20635	35 El. 20dB	£61.95
20817	17 El. 15dB	£97.95	20655	55 El. 21.5dB	£65.95
70cms			20696	4 x 23 El. kit	£319.95
20909	9 El. 8dB	£45.95	20666	4 x 55 El. kit	£419.95
20919	19 El. 16dB	£53.95	Full range of splitters etc. Phone		

MFJ

Ham Radio Accessories

ORDERS ONLY ON: FREEPHONE 0500 73 73 88

MFJ-784B Filter

Price Down! £239

- Works with any rx. or tcvr.
- DSP filter, fully programmable
- 16 Factory pre-sets
- Plugs directly into audio out
- Drives speaker or headset
- Requires 12v at approx 500mA

MFJ-948 HF ATU

Price Down! £129

- 300 Watts PEP 150W CW
- 1.8 - 30MHz - with ease!
- Wire, coax or balanced line
- Balun included for best match
- 30 / 300W power meter - PEP / RMS
- Antenna selector, by-pass etc.

MFJ- 949 HF ATU

Price Down! £149

- 160 to 10m 300W PEP 150W CW
- Wire, coax or balanced feed
- Built-in Dummy Load
- 30 / 300W power meter - PEP / RMS
- Antenna selector, by-pass etc.

MFJ-9406 6M Trancvr.

Price Down! £249

- 50 - 50.3MHz 10W SSB
- RF speech processing
- 10MHz xtal filter
- Super performance
- Ideal way to 6M DXing

MFJ-259 HF Analyser

Price Down! £229

- 1.8MHz - 170MHz
- Digital Readout
- Resonance
- VSWR
- Impedance
- AA batteries or
- 12v external

Connect to aerial or coax and adjust it in seconds. Turns hours into minutes and ideas into antennas!

MFJ-1278DSPX Data Unit

£399

- Multi-mode
- Packet
- Amtor
- Pactor
- Colour SSTV
- 10 Modes total
- DSP filtering
- Tuning scope
- Simple to us
- Software

Windows Software

NEW £36.95

Just arrived, the latest Windows Software for MFJ TNCs and Multimode modems. Now you can operate in a familiar environment with much improved software.

MFJ-1286W TNC software	£36.95
MFJ-1289W Multimode software	£63.95

All supplied on 3.5" size discs.

MFJ-781 DSP Filter

NEW £139

- Digital Audio Filter
- CW 50, 100, 200, 500Hz
- Amtor, fax, GTOR, PACTOR
- RTTY, SSTV, We-FAX

MFJ-914 Auto Match

NEW £59.95

Your Auto ATU will now match any aerial when used with this.

Auto-Tuner Extender

Connect between auto tuner and transceiver - no more problems with G5RVs and all those difficult antennas - 160 to 10 metres

MFJ-906 VSWR / ATU

NEW £79.95

- 50MHz - 54MHz
- ATU and VSWR power meter
- Matches all coax systems
- 100W CW/FM 200W SSB
- Tuner by-pass - SO-239 sockets
- Size 203 x 63 x 76cm

Ameritron 811 1kW

Price Down!

The only currently available HF linear to have passed a full lab. CE test

- 1 kW linear 9dB Gain
- Like a 5 element Monobander!
- Uses low cost 811A tubes
- Built-in rugged AC Supply
- Instant by-pass switch
- PA V/A meter + Grid meter
- Over rated variable capacitors
- Fan cooled for long life
- Very efficient - 600W output
- Easy to tune and connect
- Size 16" x 13.75" x 8"

160 to 10M of DX-Getting Power
Perfectly matches all 100W rigs

£799

MFJ-441 Keyer

£59.95

NEW

- 2 - 65 WPM - suits all transceivers
- Adjustable tone, volume and weight
- Semi-auto, auto and Iambic
- 37 character memory
- Use AA cells or external 12v
- 105 x 88 x 35mm approx

MFJ- 941E Atu

Price Down! £109

- 160m to 10m ATU - 300W
- Wires, Coax and Balanced Feed
- Cross Needle VSWR & Power
- 3-Way antenna selector
- By-pass position - Dummy load socket
- Internal Balun - 30 or 300W position
- 260 x 180 x 70mm

MFJ- 250X 1kW load

Price Down! £34.95

- 1kW Dummy Load
- Oil cooled design
- SO-239 socket
- Ideal for linears
- 1MHz to 400MHz
- Oil not supplied

MFJ- 260C 300W

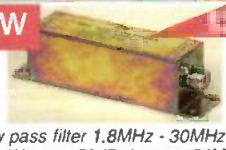
£34.95

Price Down!

- Dummy Load
- 50 Ohm
- 300W
- OK to 450MHz
- Air cooled
- SO-239
- Totally enclosed
- Essential item

MFJ-702 LPF Filter

NEW



- Low pass filter 1.8MHz - 30MHz
- 200 W pep - 50dB down at 54MHz
- Loss less than 0.5dB
- SO-239 size 150 x 25 x 38cm approx

MFJ-840 Handy Meter

- 144 - 146MHz
- 0 - 5 Watts
- BNC \Handheld fitting
- Reads power out

£23

MFJ-418 CW Tutor

NEW £79.95

"It's an Amazing Idea!"

The Morse Tutor that has taken America by storm. Listen to carefully structured code practice or listen to actual QSOs - and they never seem to be the same - GREAT!!!

- Displays words, letters and numbers
- 3 to 35WPM with natural CW note
- Various modes including Farnsworth
- Enormous vocabulary of words
- Actually sends QSOs as well!
- Individual characters or groups
- Headphone socket; Power from PP3
- Sends text just like an actual test.
- A tutor that displays what it sends.

Mirage 100W 2m Amp

NEW £199.95

Fan Cooled

- 144 - 148MHz 100W Out FM & SSB
- Input 1W - 8W - ideal for handhelds
- GaAsFET switchable pre-amp
- RF sensing with 1 sec delay on SSB
- Supply - 13.8V at 15Amps approx

Mirage 160W 2m Amp

£299.95

NEW

- 144 - 148MHz FM & SSB 160W out
- 40-50W input - ideal for modern FM rigs!
- GaAsFET switchable pre-amp + lo-high
- RF sensing - Adjustable SSB delay
- VSWR & temp. protected
- Supply - 13.8v at 25 Amps approx

MFJ-219 70cm Meter

NEW £99.95

- 420 - 450MHz Ant Analyser
- "N" or SO-239 version
- Measure VSWR & Resonance
- Uses AA cells
- Ext. socket for freq. counter
- Adjust ant. on site quickly
- 188 x 60 x 54mm

Waters & Stanton

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Wireless

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We keep the largest stocks of aerial rotators in the country.

from £50 – £2000

Call us and we will give you professional advice to help you make the right choice.

SISKIN DATA
We have one of the UK's leading experts in data communications on site in Southampton.
A huge range of TNC's for 9600/1200 baud is available, with a full technical back-up service.
Call Phil Bridges NOW on 01703 251549

A selection from our used equipment list

HF TRANSCEIVERS/AMPLIFIERS		MARCH/APRIL 1997	
FTONE	Yaesu	HF Transceiver 100W, Gen, FM + filters	£725.00
FT747GX	Yaesu	HF 100W gen/Tx (two available)	£475.00
FT77	Yaesu	HF 100W gen/Tx	£295
FC700	Yaesu	HF antenna tuner	£169.00
FP707	Yaesu	12V PSU	£99.00
VF0120	Kenwood	Ext VF0 (for TS830)	£99.00
HT115	Tokyo	HF 10W 15mtr mobile SSB/CW s/h	£249.00
HT180	Tokyo	HF 10W 80mtr mobile SSB/CW s/h	£249.00
IC737	Icom	HF 100W gen. cov (as new)	£1195.00
IC726	Icom	HF 100W gen cov + 6mtr	£899.00
IC729	Icom	HF 100W gen cov + 6mtr s/soiled	£1060.00
FTONE	Yaesu	HF transceiver 100W gen	£675.00
FT757	Yaesu	HF transceiver 100W gen	£585.00
FT890AT	Yaesu	HF transceiver, boxed	£1250.00
TS520SE	Kenwood	HF transceiver 100W warc	£335.00
FT767GX	Yaesu	HF transceiver gen cov	£1450.00
IC765	Icom	HF transceiver	£1699.00
TS130S	Kenwood	HF transceiver 100W	£395.00
FT747GX	Yaesu	HF 100W 10-80mtrs gen	£450.00
FT901	Yaesu	HF transceiver 5 band, pre WARC	£335.00
FT101Z	Yaesu	HF transceiver	£260.00
FT757GX	Yaesu	HF transceiver	£495.00
FC757AT	Yaesu	Auto ATU with memo s/h	£250.00
FT980	Yaesu	HF transceiver	£625.00
TS690S	Kenwood	HF/6m transceiver	£1175.00
TS430	Kenwood	HF transceiver	£525.00
TS940SAT	Kenwood	HF transceiver	£995.00
TS440SAT	Kenwood	HF transceiver (2 models available)	£750.00
TS520	Kenwood	HF transceiver	£2600.00
IC729	Icom	HF 100W gen	£695.00
IC761	Icom	HF 100W gen	£995.00
IC725	Icom	HF 100W gen	£525.00
IC726	Icom	HF 100W gen	£1850.00
IC720	Icom	HF mobile	£365.00
VHF/UHF TRANSCEIVERS			
FT736R	Yaesu	2mtr/70cm multi-mode 25W, ex-demo	£1295.00
FT290RII	Yaesu	2mtr multi-mode portable	£375.00
FT690RII	Yaesu	6mtr multi-mode portable	£375.00
FT4700RH	Yaesu	2mtr/70cm mobile 45W	£329.00
FT2700R	Yaesu	2mtr/70cm mobile 25W	£279.00
FT2500M	Yaesu	2mtr mobile 45W (as new)	£279.00
FT51R	Yaesu	2mtr/70cm handheld (no box)	£325.00
FL2025	Yaesu	25W matching L/amp for FT290RII	£119.00

And lots more . . . phone now

Call Ailsa at Southampton
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Call Rodney at Axminter
01297 34918

Call Jez at London
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es – phone our sales teams – NOW!

FT1000MP RRP ~~£2499~~ PHONE

- Dual receivers
- Enhanced D.S.P.
- Collins filters
- CAT interface

We keep a huge range of accessories for all Yaesu products
If you have purchased a Yaesu radio from us in the past month we will give you 10% off any Yaesu accessories
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EDITOR'S Keylines

Rob Mannion's viewpoint on the World of Amateur Radio

Another Grandfather's privilege! Granddaughter Georgia (one year old on 4th May) and 13 year old Labrador Mandy who averages 12 *PW* club visits a year!

I've a particular interest in the history of this century. And close friends tend to be aware of my tendency to 'live in the past', with fond memories of things I've grown up with (a Grandfather's privilege perhaps?). These include railways, my boyhood travels on my bike in the Hampshire countryside and the many hours spent roaming (quite freely in the 1950s) in Southampton Docks with its varied collection of huge passenger ships, steam engines and other things to interest a more than adventurous young man.

With my activities in radio well under way in the 1950s, I always took a particular interest in the various transmitter sites I came across when out and about on my bike. And in particular, I have in mind the low power regional BBC stations at Tichfield (my mother's home village) just outside Fareham (between Portsmouth and Southampton) and Bartley.

Bartley, located on the very edge of the New Forest near Cadnam, transmitted the medium wave West Region programmes. It was the first transmitter I picked up on my home-made crystal set. But this transmitter, unlike the Tichfield (Fareham) transmitter which is still at work has long since been closed and demolished.

However, in my travels around the UK, I still take a great interest in the various transmitters sites I come across. Having worked in broadcasting myself, I'm still fascinated in these magnificent 'memorials' to radio engineering and the splendid antennas which I could do much with!

You might think I'm a little strange, but I really do get a thrill when I see the extensive antenna arrays at the BBC's h.f. transmitter site such as Woofferton (this historic transmitter is so close to the county borders I'm not sure if it's in Herefordshire or Shropshire!) whenever I stay at a nearby 'Motor Lodge' Motel.

The Motel is built on the trackbed of the long-closed Woofferton to Tenbury Wells railway. And I always know I have arrived at the Motel - because as I approach the front door, the familiar voices and theme tunes of the BBC World Service can be heard coming from the front door security telephone! (And we think we've got EMC problems!).

Engineering History

I've had a great interest in British broadcasting (and of course this naturally meant mainly the BBC because of the way broadcasting was organised in the UK) engineering history. When I needed help for further research, *PW* played a part when I advertised in the magazine for a copy of *BBC Engineering History 1922-1972* by Edward Pawley. And as I hoped - a reader had a copy of this extremely rare book which he sold me.

If you share my interest in the world of broadcast engineering, you may have shared my concern and feeling of great loss when the **BBC SOLD ITS TRANSMITTERS** recently. At one stroke - which drew remarkably little publicity or attention (even though it was certainly not 'hushed up') 70 or so years of engineering history was sold to an American company based in Texas...and to me, this action came as a profound shock.

The trend of broadcasters leasing 'air time' on transmitters not owned by themselves, or in fact not being able to transmit their own programmes is not itself unusual. Transmission by a 'third party' has been the rule with ITV in this country and the service is now (funnily enough perhaps) transmitted by National Transcommunications) NTL, nowadays itself also an American owned company. But for the BBC to go the same way seemed to me to tragically break a long tradition.

In the future when I pass the famous broadcasting transmitter sites formerly owned by the BBC I'll stop and think. I'll remember the long and proud tradition provided by many engineers over the decades providing service, innovation and loyalty to **their broadcaster**.

Perhaps I'm really 'old fashioned', but despite the benefits of money raised being used for other purpose (Digital Audio Broadcasting included) **I am really concerned.** Speaking for myself, I'm sure that the BBC has lost a wonderful and valuable asset by 'selling' their irreplaceable years of experience along with the associated staff and transmitters.

Not a lot to do with Amateur Radio you might think - but many amateurs work in broadcasting. The BBC has provided careers for many radio enthusiasts and has always been in the forefront of development.

I fervently hope that the engineering opportunities do not lessen in the future. And I also wonder what will happen if the BBC and the transmitter owners cannot agree terms in years to come. Would the BBC go QRT? I fervently hope not!

Writing For PW

We receive a steady stream of ideas from budding authors wishing to write for *Practical Wireless*. All the articles are welcome, but sometimes authors get very cross at me for sending them back - even when they've not actually been turned down! (We often advise the author to re-submit their work incorporating cuts and modifications).

By far the most common reason for the rejection of an article is not that it's unsuitable (far from it!) but that we have recently published a similar article or have 'something in the pipeline'. However, when the article is returned to the writer, I occasionally receive letters from the author who cannot believe, or does not wish to believe that we have a good reason for (politely) sending their article back.

Even more occasionally, I get articles sent in by authors **who actually tell me in their letter that their article was written for another magazine. They've sent it into *PW* because they've 'Got fed up with waiting" with the other magazine to publish it, or it was rejected by the first magazine.** (What an admission!).

No magazine Editor likes to think their magazine is 'second best' or an 'also ran'. Even if the prospective author does not intend to give that impression - that's what it feels like from my end! The other reason why an article was written for another magazine may well be unsuitable or *PW* is that every magazine has **a different approach and style.**

Very occasionally I see articles from authors who may have never seen *PW* or have not read it for many years. And of course, **they are very unlikely to succeed writing 'blindly'.**

But despite the 'doom and gloom' we really do need your articles! So, please don't be discouraged, I'm only trying to help and you help us all by just bearing in mind the following tips:

Firstly, check with us that we need or would be interested in your idea. If not we can perhaps advise you on other similar ideas. Please read *PW* and try to write your article to the style of the magazine, remembering that the magazine is not an academic journal and our hobby is enjoyable! So, an informal, informative and friendly style will help.

Bear in mind we have a need for smaller constructional ideas and articles to keep the 'practical' side of the hobby alive. In contrast, we always seem to have plenty of historical articles.

And please remember that we cannot consider or accept unsolicited equipment reviews. For obvious reasons, authors who are to undertake research for reviews are chosen by myself in a determined effort to ensure impartiality.

Finally, the best advice I can give to encourage authors to submit work, is to ask us to send them a copy of our *Author's Guide*. Packed with information, the guide will help you prepare the idea and will encourage you to talk to us for further guidance.

So, on behalf of the Editorial team I wish you luck in writing for *PW*. And although our guide cannot guarantee we publish your article...it will help the author involved and the *PW* team do the best we can for our readers.

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.

RECEIVING You

PW's Postbag. If your letter is published you'll win a prize.

Letters Received Via The 'Internet'

Many letters intended for 'Receiving You' now arrive 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! **Editor**

Reviving PW Blueprints

Dear Sir

A recent writer was asking about old *PW* blueprints, this prompted me to write this letter. There must be lots of old circuits stored away. I think it would be of great interest to revive some of these in a special article.

Back in the 1950s *PW* published a design for a one valve receiver using an ECL80 in a reflex circuit covering medium waves. This prompted me to buy my first soldering iron, a 25W costing 7/6d (35p). Using a piece of biscuit tin pinned to two 1/2in pieces of wood and mounted in a 8 x 6in box with a 4in speaker, this successful receiver ended up in my sister's bedroom!

I think a lot of fun and learning can be had out of experimenting with such circuits which would have made a good t.r.f. short wave receiver. I'm sure I would build it again out of my junk box and look forward to your comments on the possibility of such an article.

Ken Furness G7TRA
Bucks

Editor's reply: When I asked for 'feedback' from readers regarding the possibility of re-printing 'blueprints' (February 1997, page 11) we got far smaller a response than expected. Like those readers who have already registered their interest in new editions of the 'HF Data Card' (March 1997, page 8) and 'blueprints' you've still got time to let us know your thoughts on the subjects (postcards only please - addressed to the Editor).

Enamelled Wire

Dear Sir

With reference to my letter in the January issue of *Practical Wireless* regarding preparing enamelled wire for soldering, let me first say thank you to the Editor and Mr **Duncan J. Walters** for their advice. I have tried both methods and regretfully I find neither very satisfactory.

Burning off enamel insulation with a methylated spirit flame has two snags. One is overheating the wire to melting point (remember these are thin wires, 30s.w.g.) and the second is trying to get the wire from the match into the 'meths' before its cools off. Mr Walters' idea works very well with thicker wires but is extremely difficult with thin stuff.

No doubt I shall find a solution and I once again thank these two people for their help.

John Noble
Kent

Editor's reply: Can anyone else come to John's rescue with ideas?

Lasers & Belfries

Dear Sir

That an august technical journal as is *Practical Wireless* should deem fit to publish an article encouraging the use of laser beams to further the cause of amateur radio while, seemingly, remaining wholly indifferent to their effect on belfries, leaves me more than somewhat puzzled.

Bats are not concerned about their own influence on the environment and, indeed, like most other animals, they do not recognise 'human rights'. Moreover, this project disregards some quite fundamental aspects, such as what happens to the bat-guide beam when it is raining cats and dogs?

Practical Wireless will be well advised to seek expert opinion before making any further, although grantedly amateurish, research into this highly sensitive field of biology - perhaps from Batman himself. There is much to commend journalistic licence and the 'Bats in their Belfry' in particular.

However, that this specific paper is published in your issue of April the 1st - of all dates - leaves quite a wide margin for any legitimate doubt of the mental sanity of us all. (Just joking Ed!).

This Month's Star Letter

Electromagnetic Radiation

Dear Sir

I am writing to you to question the controversial issue of the non-thermal effects of electromagnetic radiation (EMR). I have heard many differing opinions on the subject from different sources, but I am still not clear on 'safe levels' of radiation.

Firstly, has anything been proven as to the negative effects of an electromagnetic field in close range (such as operation a hand-held close to your face) or are the varied safety warnings purely speculation?

Another thing that concerns me is the safety recommendations in the 'Safety' chapter of *The ARRL Handbook* (1997) as to the siting of antennas in relation to the r.f. fields produced. With regards to mobile operation, they state: "...avoid transmitting with more than 25W in a v.h.f. mobile installation unless it is possible to first measure the r.f. fields inside the vehicle...." (Ref: Page 9.14).

Is this recommendation over the top, or are many users of mobile dual-band rigs supplying 50W on v.h.f. and 35W on u.h.f. actually endangering themselves more than they realise? And is it safe to use a 100W mobile h.f. rig in the car?

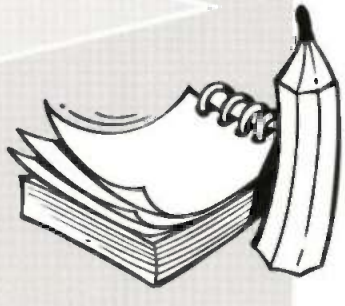
Again, I am unsure whether there is any conclusive proof that these r.f. fields can be dangerous (causing brain cancer or even leukaemia?).

I am currently studying for the May RAE with the help of some friendly amateurs and s.w.l.s from the local club (I have passed my Morse) and I hope myself to become a radio amateur and join the many other amateurs already involved in this exciting hobby.

Well done with the fantastic magazine, I especially enjoy the rig reviews and the new 'Antennas In Action' section. Please can you help me with my puzzling dilemma on EMR!

Iain M. Hutchison (s.w.l. aged 14)
Inverness

Editor's reply: Ian has raised some extremely interesting points. There's much speculation on the subject he's raised and in the various medical journals I read - it's obviously under investigation. But apart from reading about strong 'near fields' causing micro-organisms to mutate (in closely controlled laboratory experiments) I have not seen any direct reference to the effect on humans. Personally, I try to 'play safe' with any radio frequency radiation under MY CONTROL although remaining aware that we are 'bathed' in radiation from many different sources that are not under our control! I've no doubt that individual readers have the latest information on the latest up-date on this extremely important subject and invite their comment, and I also wish Ian the very best of luck for his RAE (I feel sure he'll pass!).



Thanks for a good monthly read and with kindest regards.
Ken Jones
Italy

Editor's reply: Having seen a certain church tower located in the Italian town of Pisa Ken...I think certain experimenters 'leaned' a little too hard on the power of their lasers! However, we thank everyone who wrote in appreciating our April fool 'spoof' article. And although we hope to continue stimulating the radiation of response and interest from readers, the laser beam is now switched off and the correspondence on the subject closed!

Bulgarian Request

Dear Sir
I collect pictures of 'Corals' reefs and I would be very happy if any of your readers, my fellow radio amateurs, could send me any coloured photographs or pictures from old magazines of 'Corals'.

They are very hard to find in Bulgaria. I use these pictures to copy from and paint onto canvas.
Ivan Hristov LZ2LP
PO Box 25
5500 Lovetch
Bulgaria

Editor's comment: Please send any contributions direct to Ivan. However, *PW* will NOT be responsible for the 'kidnapping' of old *National Geographic Magazines* from Doctor's or Dentist's surgeries!

Antennas In Action Appreciated

Dear Sir
I have just come home from the shop with my copy of the May issue and I have to say how much I am enjoying reading it. I have written to you in the past and have been very critical so it seems only fair to send praise when it is due.

I particularly like the way that *PW* is living up to the 'Practical' part of its title. The whole magazine is full of people doing things.

Of particular interest to me is the 'Antennas In Action' bi-monthly section. I only have a very small garden and am constantly experimenting with antennas (should that be antennae?). I find the guidance and encouragement given very useful.

My main mode is RTTY - I hardly do anything else, but I do operate c.w. (Someone did tell me once you can plug in a microphone and talk to people!). Operating RTTY is rather a minority interest and whereas the s.s.b. and c.w. enthusiasts can write in with loads of reported DX, us RTTYers are lucky to work one or two new DX stations a week so we tend not to write in. Maybe we need more encouragement - does the 'HF Far & Wide' column wants RTTY reports?

Going back to c.w., I was very interested to read the letter from **Ray Howes G4OWY** about improving Morse copying speed. My own experience does seem to bear out what he says. I had got stuck writing at about 15w.p.m. and wanted to go faster when I 'bumped into' another c.w. enthusiast on packet. He advised doing away with the pencil. It has worked for me and I can now copy 25w.p.m. if the sending is good. So I have dusted off my copy of 'NuMorse' which I got from *PW* and am running it at 30w.p.m. I've only been trying this for a few days but it seems to be working. Maybe Ray has made a major discovery.

Thanks again for a really useful and practical edition.
Peter Halls G4CRY
York

Editor's reply: The Editorial team are delighted to hear you enjoy 'Antennas In Action' Peter. And of course, Leighton Smart the compiler of 'HF Far & Wide' will be very pleased to have DX reports from RTTY operators.

Thanks Tex

Dear Sir
Thank you *PW* for excellent service. That is of course special thanks to **'Tex' Swann G1TEX**, Technical Sub-Editor at *PW*. I posted a letter to *PW* queries asking for information on where I could purchase a NE602 for the FRG-7 receiver by **Rev. George Dobbs G3RJV** and also the value of two capacitors.

In a very short time (about one week) I received a letter with all the information I required plus data sheets for the NE602 and the Toko coils and information on the BB212 varicap, all of which has been very useful and informative. Again, many thanks to you.
Nigel Booth
Norfolk

Tex's comment: Nigel was lucky, I was at at point at which I could answer his letter. There are however, others who have to wait a little longer unfortunately.

Morse Advice

Dear Sir
In July, I shall be 52 years of age and I remember some of the quaint sayings, from my childhood, as spoken by my Elders, especially my Aunties. Why have these memories come to the fore, and why have I taken the trouble to set them down in writing at this time of my life? Simple, such sayings as: "There's none so blind as them you cannot or will not see"! or: "They're too blind to see the woods for the trees" are as pertinent today, in amateur radio, as they were in my childhood.

Take the constant stream of letters that carp on about abolishment of Morse code, from amateur radio, where do these people get this poorly considered idea? The **proposal is only for the abolishment of the 12w.p.m. Morse test and not Morse code**. Yet, time after time, in one amateur magazine or another, there's another letter pleading that Morse code should be kept. Please people, all that is being asked for is the abolishment of the 12w.p.m. Morse test for you or anyone else to obtain an 'A' class licence.

I would also like to take umbrage at the suggestion, implied, that Morse code can be simply learnt from sitting and listening to it on one's receiver. I think this is total rubbish! If you do not know the Morse code, how can you learn it by sitting, with your ear glued to a receiver? You have to learn the Morse code, the old, tried, true and tested way, after all that is the way, the successful way that it has been done, since old Sam Morse invented the code. Of course, once you have learnt it, then there is nothing stopping you from improving your receive speed by sitting for hours at a receiver.

However, that will not improve your transmit speed and you can confirm that by listening to the poor sending that is often passed of as good Morse. Basically, what we all need for learning Morse code is: patience, fair to excellent co-ordination and lots and lots of time!

So, pay no attention to the well meaning club member, or anyone else who says that he or she has a new way, a better way. If you stick to the basics, you'll not go wrong, as far as learning Morse code is concerned. Converting what you hear, back into the written word, etc., is the major problem we all go through. Some find it quite easy, others struggle a wee bit as they hit a hump or two at various speeds, others, unfortunately, go nowhere, no matter how hard they try and its usually co-ordination that is the problem. Nobody can teach that, its something you have to practice yourself and it can take months, even many years.

Once you have the 12w.p.m. pass certificate and your 'A' class licence, should you wish to climb up the dizzy heights, above 20w.p.m., then again that comes with practice, practice and more practice, both at sending and receiving. Again, it comes down to that very real problem of co-ordination, the faster you go, the harder it is to write it down, or like some, you can read the Morse like you do a book, that is if your memory is also good and the message is short.

Above all else, no matter who or what you read, be it this letter, or others or in chats at clubs, rallies and on the air, the one and only major contributing factor, above all else is time! The time you set aside for learning, for practising, for improving all facets of Morse code, from the day you first start to the day that you reach the goal that you have set for yourself, and even then, you can't let up, you've still got to work it on air, daily!
J. Davies-Bolton G4XPP
County Durham

Channel Spacing

Dear Sir
I have noticed very little correspondence about the 12.5kHz numbering of channels agreed at the IARU Conference. The idea of working this out from division from a specific frequency is sure to cause confusion and to my mind totally unnecessary.

When the marine channels went to 25kHz spacing all that happened was a prefix '6' was added, Ch. 6. 156.300MHz had its 'add-on 25kHz, 156.325MHz becoming Ch. 66 Ch 8 156.4MHz + 25kHz Ch 68, 156.425MHz.

Why not, for the amateur bands? Say add a 5 so S20 + 12.5kHz becomes S520. R6 + 12.5kHz = R56 or is this too easy?

Having to divide down frequencies before a QSY will be a pain and whilst I am equipped for 12.5kHz on 144 and 430MHz, I vow that I will always state a frequency and not the new channel numbering.

I would be interested in any comments favouring the IARU decision.
W. Symes G8AIV, Merseyside

NEWS 1997

Compiled by Donna Vincent G7TZB

Nevada News

News has arrived from Portsmouth based **Nevada** that the latest h.f. transceiver has arrived from SGC in the USA. As the UK agents for SGC Inc. Nevada has informed the *PW* Newsdesk that the **SG 2000** 'Power Talk' h.f. transceiver with digital signal processing (DSP) is now available.

Reflecting SGC's military equipment background the new SG 2000 h.f. transceiver is ruggedised and is particularly suitable for maritime mobile, heavy duty or home-base use. The transceiver features a removable control head, and the manufacturers claim that the DSP is of advanced design.

Retail selling price of SGC's latest rugged transceiver is **£1895** including VAT. For further details contact **Nevada Communications** at **189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626.**

Editorial note: *Practical Wireless* will feature a review on this transceiver in the near future. **Editor.**

Another League

The **Shortwave Shop** who are based in Christchurch, Dorset, have taken amateur radio into another league by sponsoring a football strip. **Bob Burrows,** proprietor of the Shortwave Shop, was only too happy to sponsor Christchurch Junior School's football team strip, as both he and his children attended the school.

Bob says it was a good opportunity to put something back into the school and community. The team has played several games in their new strip and so far has not lost a game! Obviously the magic of Amateur Radio extends far further than the airwaves.

Copyright Derrick Penman

Rolls Royce Repeater

After two and a half years of hard work and perseverance by the **Hucknall Rolls Royce Amateur Radio Club** the 50MHz (6m) repeater **GB3RR** was finally put on air on 1 May 1997. The repeater is located 12km NW of the City Centre of Nottingham and is operational on 51.320MHz (input), 50.820MHz (Output) and has a CTCSS access tone on 71.9Hz.

The repeater project started in October 1994 when the Hucknall club were asked to submit an application. In the month's that followed **Jon G4TSN** and **John G0LBW** started to put the hardware together and start trials. The main challenge they faced was in the construction of a duplexer.

The Hucknall Rolls Royce ARC look forward to receiving reports from users of GB3RR and would like to thank all those involved in getting the repeater operational. In particular thanks go to **Dan N5MRG, Richard G1SLE, Fred G4SPR** and **Ian G0RDI** for their technical support and **Steve G0LCG** who managed to persuade his boss at **Anchor Supplies Limited** to sponsor the project.

For more information on GB3RR contact Jon G4TSN or John G0LBW, QTHR and if you can offer support or donations please contact Steve G0LCG on **0115-975 5252.**

Yorkshire Day

The **Scarborough Special Events** Group will be activating **GB3YD from 1 - 3rd August** in connection with the annual Yorkshire Day celebrations. A special QSL card has been produced for the event showing Robin Hood's Bay in North Yorkshire and will be No 16 in group's souvenir card series.

The main station for the event will be active on 3725kHz and there will also be activity on c.w. and 144MHz. All contacts made will be acknowledged via the Bureau and listener reports are also welcome. Anyone who requires a direct card call should apply via the club call **G0OOO.**

Yaesu's New Mobile

The new Yaesu **FT-8100R** dual-band f.m. mobile transmitter will be available in the UK very soon. Yaesu (UK) have announced that the transceiver incorporates a demountable front panel, true dual band receive capability with cross-band repeat built in.

Also featured on the FT-8100R is Yaesu's 'Smart Search'. This facility automatically 'sweeps' a band and loads active Amateur Radio frequencies in dedicated memory banks. The manufacturers state that this is a "useful facility" for the occasions you visit new areas.

Equipped with a built-in duplexer unit the FT-8100R can be used with a dual-band antenna and provides r.f. outputs of 50W on v.h.f. and 35W on u.h.f. A dedicated packet radio jack socket is available on the rear panel.

For further details on Yaesu UK's new import, contact them direct at: **Unit 2, Maple Grove Business Centre, Lawrence Road, Hounslow, Middlesex TW4 6DR. Tel: 0181-814 20001 or FAX: 0181-814 2002.** **Editorial note:** We hope to review the new Yaesu transceiver as soon as they are available. **Editor.**

Into The Millennium

Dortech Electronics Limited are the distributors for the new Millennium Bios Board, the software for which has been written by American Megatrends Inc. of Georgia, USA and Fernlink 2000 Limited. The Millennium Bios Board has been specifically designed to overcome the problem of the date not changing correctly when the year 2000 comes around.

Dortech say the board is unique and easy to install even for the inexperienced, non-technical user. The board is supplied with clear instructions and is said to be as simple to install as a video card.

The card fits into any spare 8 or 16 bit Industry Standard Architecture (ISA) Expansion Bus Slot. The software installs itself into the first available area for BIOS extensions in the Upper Memory Blocks. There's a set of jumpers on the Board to allow the end user to adjust the position in memory if they wish.

The Millennium Bios Board costs **£69.99 plus VAT & P&P** and discounts are available on large quantity orders. For more information contact **A. Lewis** on **(01202) 693214** or to place orders contact **Dortech Electronics Limited, Unit 2, 13 Blacksmith Close, Corfe Mullen, Wimborne, Dorset BH21 3QW. Tel: (01202) 776302 or E-mail: Sales@dortech.demon.co.uk**

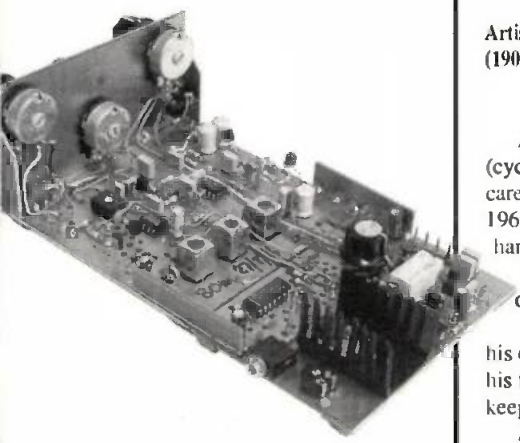
Somerset News

The **Lopen** is the latest product to be added to the **Walford Electronics** range of kits and takes the shape of a 1.5W c.w. transmitter which operates from 1.5 - 15MHz. It's primary purpose is to give full band c.w. coverage when used with Walford's Martock receiver.

The Lopen when used with the Martock the v.f.o. drives the TX and a special offset circuit allows the frequency to be adjusted either up or down to suit the receiver side-band being used. The Lopen can also be used with its own crystal oscillator and the kit is supplied with a 3.582MHz ceramic resonator for 3.5MHz allowing the offset preset to be used a tuning control. An external v.f.o. can also be used to drive the Lopen.

The Lopen kit costs **£29 plus £1 P&P** and is supplied with semi break-in TR control, antenna changeover, muting and a side-tone oscillator, together with all the hardware for joining it to the Martock. The Lopen and Martock when ordered as a pair cost £62 plus £1 P&P.

To place your order or to find out more about the Walford range of kits contact **Tim Walford G3PCJ, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. Tel/FAX: (01458) 241224.**



The Lopen transmitter shown attached to the Martock receiver.

PLEASE SEND YOUR NEWS TO DONNA VINCENT G7TZB AT THE EDITORIAL ADDRESS

Silent Key - Remarkable Radio Amateur & Artist G0LHC

Matt Oswald G0LHC was a remarkable man who died on March 7th 1997 aged 94. Matt was remarkable in many ways, but particularly so because at the age of 20 he was 'written off' following a serious illness but learned to learn to walk again, become a carpenter and builder, a highly respected artist and a Radio Amateur long after retirement age.

Reflecting the hard times on the area, Matt left his school in Easington in County Durham at 14 years of age. He became an apprentice carpenter - making crutches and wooden legs for injured coal miners.

Artist, Radio Amateur and Keep-Fit Enthusiast Matt Oswald G0LHC (1903-1997). Truly a remarkable man!

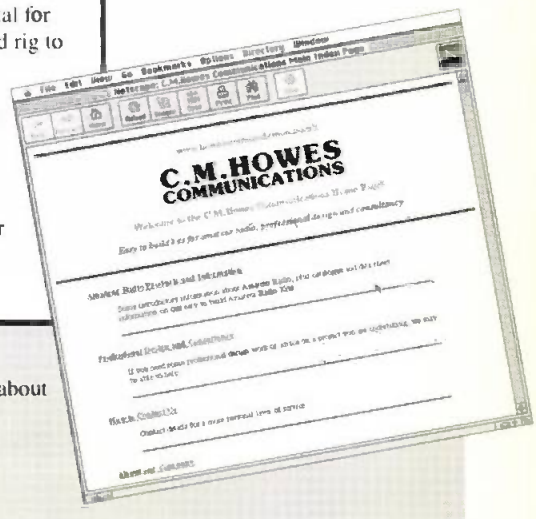
After his illness and learning to walk again he moved south (cycling from County Durham to London) and for the rest of his career he worked in the building industry. Following retirement in 1968 and renowned activities as an artist (one of his painting hangs in the mayor's Office in the London Borough of Hillingdon), Matt passed the RAE at the age of 80 and went on to get his Class A licence.

Matt, a widower since 1989, was also a keep fit fanatic with his own gym and even took his chest expanders into hospital for his final stay! (Along with his sketch pad and his hand-held rig to keep in touch with his friends).

Practical Wireless is grateful for the news and information about this obviously great Radio Amateur and determined man, and in particular we thank Matt's good friend **John Acton G8UXT**. And I've no doubt that although Matt's family will be sad at their loss, they'll certainly be proud of knowing such a remarkable man. Our sympathies and our admiration go to them. **Editor.**

Howes Homepage

The latest company in the Amateur Radio business to join the Website world is **C.M. Howes Communications.** The Howes site contains catalogue pages, data sheets, background information about the company, contact details and an introduction to the Howes professional design and consultancy services. To catch the Howes Homepage you should point your web browser at **www.howes-comms.demon.co.uk**



Valuation Service

David Cole G3RCQ has recently set-up a division within his Accountancy Practice to deal with the valuation and sale of deceased Amateurs' and Short Wave Listeners' radio equipment. David is a qualified accountant with 40 years of radio and electronics experience having passed the RAE in 1962 and then traded in the business under the banner of G3RCQ Electronics.

David will negotiate and advise on a one-to-one basis with Solicitors, Accountants and relatives and make arrangements for the speedy sale of radio equipment. He recognises that the passing of friends and relatives is traumatic enough and feels it important that radio equipment is professionally valued if the beneficiaries are to receive full value.

For more information contact **Cole & Co. Accountants, 9 Troopers Drive, Harold Hill, Romford, Essex RM3 9DE.**

Address Change

Chris Page G4BUE of **Adur Village Press** has recently notified the Newsdesk of a change of address. As from immediate effect Adur's new details are: **Highcroft Farmhouse, Gay Street, Pulborough, West Sussex RH20 2HJ. Tel: (01798) 815711, Mobile: (0410) 054906, FAX: (01798) 813054** or **E-mail: g4bue@adur-press.prestel.co.uk** Why not contact Chris for full details of his range of products which include QSL cards and magazine binders?

RADIO Diary 1997

Compiled by Zoë Crabb

We're well into the Rally Season now, so here's a bumper Radio Diary for you to look at and decide which one's you'll be attending this year.

If you wish to have your Rally featured in Radio Diary, all you have to do is to put together as much information about the Rally as possible, ie. date, location, time, who to contact, etc., and send it to Zoë Crabb at the *PW* Editorial Office.

June 21: The Royal Navy Amateur Radio Society are holding their Annual Mobile Rally at HMS *Collingwood*, Fareham, in conjunction with The Royal Navy Brickwoods Field Gun Competition and HMS *Collingwood* Open Day. This year's rally will have a similar format to last year, plenty of action for all the family including the Free Fall Parachute team and the Hampshire Police Motor Cycle Team, plus all the usual Amateur Radio content for the remainder. **(01705) 365503.**

June 22: BDARS Amateur Radio Rally will take place at Clandeboye Lodge Hotel, Bangor, Co. Down, N. Ireland. There are many attractions - Official Morse Test for aspiring A licensees, demonstrations, packet radio, amateur television, Bring & Buy, local and mainland traders, something for all the family, so don't miss it! Further details from **Stewart GI4OCK** on **(01247) 454049** or **Norman GI3YMY** on **(01247) 466557.**

***June 27-29**: Ham Radio '97 - Europe's largest Hamfest will take place in Friedrichsafen, Germany. The Barnsley & DARC in conjunction with the RSGB will again be organising a coach trip to this Hamfest. More information from **Ernie G4LUE** on **(01226) 16339** or mobile on **(0836) 748958.**

***June 29**: The 40th Longleat Amateur Radio Rally. Doors open at 10am. Further details from the bookings manager **Gordon Lindsay** on **0117-940 2950.**

July 6: The 8th York Radio Rally will be held in the new Knavesmire Building, York Racecourse, York. Doors open at 10.30am and admission is £1.50. Children accompanied with an adult go free! There will be ample free parking, amateur radio, electronics and computers, Morse tests and repeater groups, refreshments and a licensed bar. Talk-in on S22. Further details from **Pat Trask G0DRF** on **(01904) 628036.**

***July 12**: Cornish Radio Rally. More information from **Ken G0FIC** on **(01209) 821073.**

July 13: The Three Counties Radio & Computer Rally is to be held at a new venue, the Perdiswell leisure Centre, Bilford Road, Worcester. Features include amateur radio, computer and electronic component traders, Bring & Buy stall along with RSGB Morse tests (please book on arrival and remember two passport photos will be required), refreshments and a licensed bar. Free car parking. Doors open 10.30am to 5pm and admission is £1.50. **Eddie G4PQZ** on **(01905) 773181.**

July 13: The 17th Sussex Amateur Radio & Computer Fair will take place at the Brighton Race Course from 10.30am to 4pm. There will be free on site parking and admission to the event is £2. The rally is one of the largest in the south of England with well over 100 trade stands, covering amateur and CB radio, computers, electronics, etc., and also a large Bring & Buy display area. There will also be refreshments and bars at reasonable prices with a picnic area with views over the South Downs - certainly a rally not to be missed! **(01323) 485704.**

July 27: The Colchester Radio & Computer Rally with a hobbies and leisure fair is to be held at St Helena School at 10am. This is a family event. Further info. from **Frank Howe G3FIJ** on **(01206) 851189.**

July 27: The Rugby Amateur Transmitting Society are holding their 9th Amateur Radio Rally at the BP Truckstop on the A5, three miles east of Rugby, 24 miles NW from junction 18 on the M1 Motorway. Doors open from 10am and admission is £1 per car. Facilities include a cafe and toilets. Talk-in on S22 by **GB8RRR**. Pitches are £7 pre-booked before 14 July or £10 on the day. **Arthur M0ASD** on **(01788) 550778.**

***July 27**: The Scarborough Amateur Radio Society is holding its annual Radio, Electronics and Computer Rally in The Spa, South Foreshore. Doors open at 11am. The rally features all the usual traders, radio, electronics, components, computer hardware and software. Morse tests are available on demand, but please remember the fee and two passport type photographs. Further details from the Rally Manager/Secretary **Ross Neilson** on **(01377) 257074** after 6pm.

***August 3**: The RSGB Woburn Rally is to be held at Woburn Abbey, Bedfordshire. **Norman Miller G3MVV** on **(01227) 225563.**

***August 10**: Flight Refuelling ARS Hamfest '97 will take place at the Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. The event will run from 10am to 5pm and will include the usual mix of traders, Bring & Buy, craft exhibitors, car boot sale and field events. Talk-in will be on S22. **Richard Hogan G4VCQ** on **(01202) 691021.**

August 10: The Derby & District Amateur Radio Society are holding their 40th Derby Mobile Rally at the Littleover Community School, Derby. More information on **(01332) 556875.**

August 15: The Cockenzie & Port Seton Amateur Radio Club are holding their 4th Annual Radio Junk Night at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton. Doors open 18.30 to 21.30. Bring along your own junk and sell it yourself. Tables will be provided on a first come first served basis (no charge for the table). Raffle at approx. 2100. Refreshments will be available. Disabled persons access. Entrance fee is £1 for all persons. All money raised is donated to the British Heart Foundation. Further details from **Bob Glasgow GM4UYZ** on **(01875) 811723.**

August 17: The Kings Lynn Amateur Radio Club are holding their 8th Great Eastern Computer & Radio Rally at a **new venue, this is at Wallington Hall, between Kings Lynn and Downham Market.** Features include a spacious indoor area with major exhibitors, outdoor car boot area (unlimited space available), Bring & Buy, free parking, talk-in on S22, refreshments available and easy access for disabled persons. For booking or more information call **Ian G0BMS** on **(01553) 765614** or **@GB7OPC** Packet BBS or E-mail Ian on **ian@g0bms.demon.co.uk**

August 17: The 2nd Cardiff Amateur Radio & Computer Fair will held at The Star Sports Centre and Recreation Centre, Splott, Cardiff. Open from 10.30 to 3pm. Further details from **Stuart Robinson GW0WMT** on **(01222) 613070.**

August 24: The Torbay ARS are holding their rally at the Torbay Leisure Centre, Paignton. Doors open at 10am. Talk-in on S22 by G8NJA/P. Further details can be obtained from **Alan G7UEK** on **(01803) 214445.**

August 24: The Galashiels & District Amateur Radio Society's Open Day & Rally will take place at The Volunteer Hall, St John's Street, Galashiels from 11am to 4pm. There will be traders present along with a Bring & Buy stall, a raffle, refreshments and a bring & sell feature. Talk-in on S22. Tel: **(01896) 850245** or **(01896) 755943** (evenings only).

August 25: The Huntingdonshire Amateur Radio Rally (held Bank Holiday Monday) is to be held at Ernulf Community School, St Neots, Cambridgeshire (near Tesco Superstore on A428). Doors open at 10am and admission is £1. There will be hot and cold refreshments available. Also features include a car boot sale on hardstanding. Talk-in on S22. **David Leech G7DIU** on **(01480) 431333** (between 9am and 9pm).

August 30: The Annual Wight Wireless and Computer Rally will be held at the National Wireless Museum, Arreton Manor, Nr. Newport, Isle of Wight. Open 10am to 5pm. Free entry and plenty of free parking. Free stalls for both private and business use. There will be refreshments, exhibitions and collections for RAIBC Talk-in on S22. **Douglas Byrne G3KPO** on **(01983) 567665.**

August 31: The Telford Rally is 20 years old this year. The rally will be held, as usual, in the Telford International Centre. There is plenty of parking in Telford Town Centre car parks. There will be major dealers, a flea market and much more in two purpose built exhibition halls with plenty of room to enjoy the day. Also, disabled visitors will be well catered for. **Tony M0AMP** on **(01743) 235619** or via GB7PMB.

September 6: The 3rd Northampton Radio rally & Car Boot Sale is to be held at the heart of the Shires Shopping Village Showground on the A5, just two miles north of Weedon. There will be a Bring & Buy, organised by the Northampton Repeater Group. Bring the family as they can spend the day in the 'olde worlde' shopping village. Refreshments and toilets are also on site. Car parking only 50p. All enquiries on **(01604) 32478.**

***September 7**: The Lincoln Hamfest will be held at the Lincolnshire Showground, four miles north of Lincoln on the A15. There will be the usual trade stands, Bring & Buy, Morse test with two passport size photos required, refreshments, bar and ample free parking. Talk-in on S22 and SU22. For further details contact either **John** or **Sue** on **(01522) 525760.**

September 7: The Bristol Radio & Computer Rally is to be held at Brunel Centre, Temple Meads Station, Bristol. Doors open at 10.30am to 4pm (disabled visitors 10.15am). Admission is £1. There will be a large Bring & Buy, under £30 Bring & Buy, refreshments, 100+ tables, (table hire at £15 each). **Muriel Baker G4YZR, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG** or 'phone on **(01275) 834282** (24hr answerphone).

September 14: The BARTG will be holding their rally at Sandown Park Racecourse, Esher, Surrey. BARTG '97 will follow the proven and popular format of previous BARTG rallies, however, there is one major difference - this is DataStream '97 - a series of lectures covering various aspects of data comms in amateur radio. General enquiries from **Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ. Tel: 0115-926 2360.**

September 21: The Peterborough Radio & Electronics Society East of England Rally will be held at the Peterborough Showground, easy access from A1, A605, A47. There will be trade stands, radio car boot plus other local attractions, acres of free parking, catering and bar, etc. Doors open 10.30am, (10am for disabled visitors). Admission £1.50. Talk-in on S22 via G3DQW. For booking details contact **Ted G0REM** on **(01733) 766471**, QTHR, **tmelnyczuk@compuserve. com** or for rally enquiries contact **Vince G8NGZ** on **(01733) 331211**, QTHR, **G8NGZ@compuserve.com**

*Practical Wireless & SWM in attendance

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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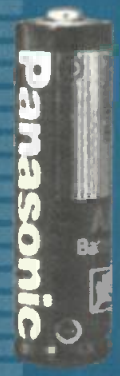

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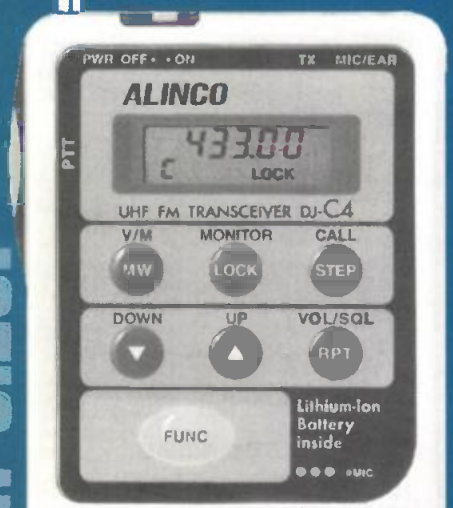

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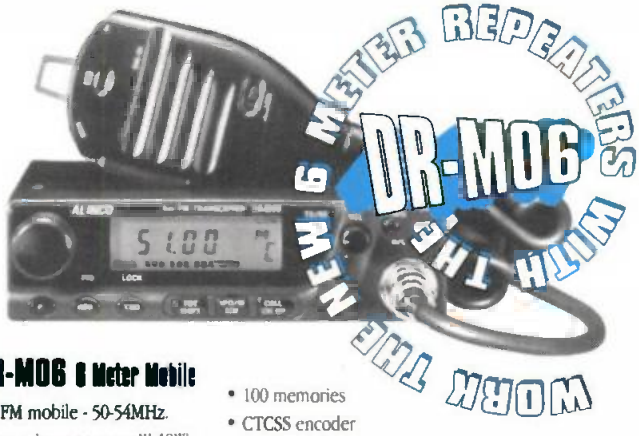

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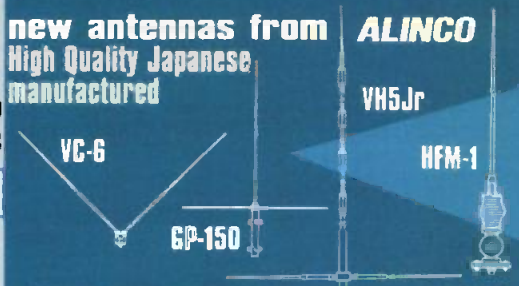

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Zoë says: "keep the News and those Club magazines coming!"

CLUB Spotlight

Compiled by Zoë Crabb

Recent Approval For Scouts

Torfaen Scouts ARC (GW0UKT), located in Cwmbran, Gwent, have recently received approval from the City & Guilds of London Institute to conduct the Novice Radio Amateurs' Examination (NRAE) and Radio Amateurs' Examination (RAE). The radio club holds regular Novice Training Courses and RAE classes, as well as Morse practice.

Membership to the club is open to anyone interested in the hobby and not just members of the Scout Association. One of the aims of the club is to encourage young members of the community into the hobby, and the links with Scouting help provide the ideal opportunity.

Many of the club's outdoor activities are held at various Scouting events. Also, the club station is regularly used for Jamboree On The Air (JOTA) and Thinking Day On The Air (TDOTA).

Adult members (licensed and non-licensed) are needed to help develop the aims of the club and to maintain the standard that the founder members have established. All enquiries are welcome and can be made to the Club Secretary **Richard GW0VAW**, QTHR on **(01633) 483277** or E-mail: **106177.253@compuserve.com**

Diary Date

The **Royal Naval Amateur Radio Society Radio Rally** (RNARS) is being held this year on **Saturday 21 June**. Last year, over 2000 members of the Amateur Radio fraternity visited the RNARS mobile rally.

Joined by some 4000 members of the general public who had come to enjoy a spectacular day out in HMS *Collingwood* (the RN Communications & Radio School), they also had the opportunity to watch some top military display teams and bands, visit the fun fair and sideshows. In other words, plenty of fun for everyone on the day.

The rally this year, on the above date, will have a similar format - plenty of action for all the family, including a free fall parachute team jump, the Hampshire Police Motor Cycle display team, plus all the usual radio rally features. The Radio & Communications museum will also be open throughout the afternoon.

Transport will be provided from the main car parking area for equipment to be moved across to the Bring & Buy stand. The day is dedicated to enjoying action packed events in the arena, browsing around the radio stands and catching up with the latest on the equipment front and maybe buying that new or second-hand piece of equipment.

The radio rally has been increased in size this year to give everyone more room to view, buy, chat, drink, eat and move around. The traders will be able to have access from Friday pm and the public will be admitted from 1030 to 1730 on the Saturday.

For further information, traders please contact **Alan Owen G4POW** on **(01705) 353404** or **Mike Matthews G3JFF** on **(01705) 365503**.

Irish Celebrations

The **Irish Air Corps** is celebrating its 75th anniversary this year. As part of these celebrations, the Signals Amateur Radio Club, EI2V, will be activated.

The Air Corps will be hosting an Air show for all Defence Force personnel from **Friday 4 July** until **Sunday 6 July 1997**. This will be located at Casement Aerodrome, South west of Dublin City.

During this weekend, the club station will be on air throughout the h.f. bands (s.s.b. and c.w.). One of the aims is to contact as many foreign Air Force radio clubs as possible. The club would also like check-in calls from all Air Force/Military radio clubs over this weekend.

Operation on s.s.b. will be centred around the following frequencies: 7.055 and 14.275. Whilst c.w. operation will be centred around 3.560, 7.020, 14.020 and 21.020MHz.

Braintree & DARS

The **Braintree & District Amateur Radio Society** meet every 1st and 3rd Monday of the month at **The Clubhouse, Braintree Hockey Club, Church Street, Bocking**. Doors open from 7.30pm for an 8pm start to the meeting.

Prior to 8pm, and during the refreshments break, members have the opportunity to sell or exchange equipment, etc. Meetings normally finish at 10.30pm.

The club membership fee is £12.50 annually. Senior

News From Norway

'Club Spotlight' really does reach out to interesting places, and to prove the point...I've just received an interesting letter from **Norleif Bjørneseth LA9FG**. Norleif who teaches at the Ørsta vidaregåande skule in Ørsta, mid-way between Bergen and Trondheim, has written in to say how much Form EL1A have enjoyed 'Carrying On The Practical Way' by the **Rev. George Dobbs G3RJV**.

Norleif writes that "In the December edition of G3RJV's series he provided an article on how to build a simple regenerative receiver. Our group is made up from boys aged between 16 and 18 who are in the first year class studying electronic subjects at the Ørsta College found it to be very useful. This is because during week 11 of the 1997 academic year all our students had to carry out a project in our main subject, but involving other subjects if possible. My class chose to combine English and electronics".

'Carrying On The Practical Way' - that's the lesson learned by Form EL1A of Ørsta vidaregåande skule in Norway who pictured with their teacher Norleif LA9FG (second from right). The other 'essential ingredient' was Inger Rotvatn (Form EL1A's English teacher) and as she missed the photo-call was of course marked absent!

With the letter, came a short report from the boys in Class EL1A: "Our teacher in electronics, Norleif Bjørneseth who holds the callsign LA9FG is a regular *PW* reader. He showed us the article by G3RJV and the project began by the translation of the article into Norwegian. This was done under the guidance of our English teacher **Inger Rotevatn** before we actually built the radio.

We divided the class into groups and built the h.f. and l.f. sections on printed circuit boards. After a few problems we got good results and in the evening we picked up several European stations - using a 30m long wire antenna. Thank you for providing us with the inspiration and Form EL1A sends greetings to everyone at *PW* and of course G3RJV"

And from 'Club Spotlight' and *PW*, we wish everyone in Form EL1A success in the future.

The Spotlight's On Again!

Yes, it's true, this is the 2nd year of the Spotlight Trophy, awarded to the Radio Club magazine of the year by *Practical Wireless* and Kenwood (UK). Last year, the Hoddesdon Club won, but who will have their club name engraved on the cup this year?

How did it all start I hear you ask? Well, David Barlow G3PLE, a retired Marketing professional and former member of the Birmingham Press Club, who now lives in Cornwall, wrote to Rob Mannion G3XFD, Editor of *PW*, and myself, suggesting a special trophy for the best radio club magazine or newsletter.

Both Rob and I thought David's idea was an excellent way of encouraging the often (hard-pressed) magazine and newsletter editors. David Wilkins G5HY of Kenwood (UK) thought so too! So, a new competition was borne!

So, let's see your magazine, whether it be weekly, fortnightly or monthly, glossy, duplicated A4, PC produced or whatever. They're all of interest and yours could win!

To enter your club magazine for the award, all you have to do is to send in two of your most recent club magazines and details of how they're published to the *PW* Editorial Offices. Most importantly, remember to mark your envelope 'Spotlight Club Magazine Competition'.

The panel of judges (as last year) are: Dave Wilkins G5HY, myself, (Zoë Crabb), Jim Bacon G3YLA, David Barlow G3PLE and last, but certainly not least, Rob Mannion G3XFD. We're all looking forward to receiving and reading your club magazines, and as we want to receive more than last year's ten entries, you'd best get busy, the spotlight's now on!

Closing date is July 25th - so hurry!

Zoë

(retirement age) and junior (under 18) members pay a reduced club subscription of £6.25.

Door fees are payable per meeting. Rates are 60p for members, 30p for junior and senior members and 80p for visitors. However, fees for visitors under 18 years old and in full time education are 40p only.

A club Net is operated on 2m (144MHz) on the 2nd and 4th Mondays (excluding Bank Holidays) under the callsigns G6BRH and G4JXG. The Net commences at 2000 clocktime on S15 - 145.375MHz, unless QRM.

The club produces a magazine *BARSCOM*, which is issued free to members, usually at the first meeting of the month. Members unable to attend club meetings should lodge s.a.e.s with the Editor for their copy.

Find out more about the club's activities from **John Button G1WQQ** (Secretary) on **(01787) 460947**.

Lagan Valley's Rally

The **Lagan Valley Amateur Radio Society** (LVARS) held its annual rally on 22 March this year at the Lagan Valley Hospital Recreation Room with the usual traders, Bring & Buy, bookstall and refreshments. Numbers through the doors were up on last year showing that interest in Amateur Radio in alive and well in Northern Ireland.

The President of the RSGB, Ian Kyle GI8AYZ (and a member of the club) made a presentation to QSL Manager **Edward Barr**, who does sterling work for amateurs. (The society would like to express their pleasure to acknowledge his contribution. Often, some of these services are taken for granted).

Club events during the year were talks on air traffic control, expeditions to Antarctica, astronomy and coming shortly is a talk by a Bangor member on his yachting adventure crossing the Atlantic!

However, perhaps the highlight of the year was the joint Irish Radio Transmitters Society (IRTS) and RSGB 'Shannon-Erne Armada'. Nine boats crewed by operators from clubs all over Ireland sailed along the Shannon and Upper Lough Erne activating many rare WAB and WAI squares.

A total of 273 contacts were made by LVARS and the 'crack' was powerful. Crew members were **David GI4SNA**, **Norman GI4SZP**, **Victor GI4LKG**, **Ed GI1GKI**, **Seamus GI4RKC**, **Ray GI4NFH**, **Peter** s.w.l. and **Ron GI4NTO**.

Further information can be obtained from **Ron GI4NTO** on **(01846) 601941** or E-mail at **Pat.Ron@virgin.net**

The President of the RSGB, Ian Kyle GI8AYZ, making a presentation to QSL Manager Edward Barr GI7FFF.

(l to r) Ray GI4NFH, Seamus GI4RKC, David GI4SNA and Ron GI4NTO.

Don't forget to send in two of your most recent club magazines to me, to be entered into the Spotlight Club Magazine Competition. Closing date is 25 July 1997, so you'd better get a move on!

Club Reminders

The **Blackmore Vale Amateur Radio Society** meet on the 2nd and 4th Tuesday of every month at Shaftesbury Upper School, Shaftesbury, Dorset. Newcomers and visitors are always welcomed. More information from **Stuart Ruffell G7JJF** on **(01747) 838554**.

Members of the **Bromley & District Amateur Radio Society** hold their meetings at 7.30 for 8pm at The Victory Social Club, Kechill Gardens, Haynes, Kent. Further details from **Alan Messenger G0TLK** on **0181-777 0420**.

Meetings are held at 8pm at the Lickey End Social Club, Alcester Road, Burcot, Bromsgrove on the 2nd and 4th Tuesday of the month for the **Bromsgrove Amateur Radio Society**. Contact **Barry Taylor G0TPG** on **(01527) 542266** for more information.

All meetings are on Wednesday evenings at 7.30pm for the **Derby & District Amateur Radio Society**. Meeting place is in the Clubroom, located at 119 Green Lane Derby. Information regarding the Society can be obtained from **Martin Shardlow G3SZJ** on **(01332) 556075**.

The **Dunstable Downs Radio Club** meet every Friday (except Bank Holidays) at 8pm at Chews House, High Street South (A5), Dunstable, Bedfordshire. Visitors and new members are always welcome, so, drop in or call **Paul G7TSJ** on **(01582) 861936** to find out more.

Members of the **Hoddesdon Radio Club** hold their meetings in the Conservative Club, Rye Road, Hoddesdon on alternate Thursdays at 8pm, unless otherwise stated. Contact **Don GJNJ** on **0181-292 3678** for further information.

Meetings are held on the 1st and 4th Tuesday of the month at 7.30pm for the **Horndean & District Amateur Radio Club** at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Visitors are welcome to any meeting. Contact **Stuart Swain G0FYX** on **(01705) 472846** to find out more.

The **Horsham Amateur Radio Club** meet at the Guide Hall, Denne Road, Horsham, West Sussex. Further information from **Miss M. Dixon G7EYL** on **0181-686 5701**.

Meetings are held at 8.30pm every Tuesday at the Churchill Club, Church Road, Wavertree, Liverpool for the **Liverpool & District Amateur Radio Society**. Details of forthcoming events, etc., can be obtained from **Ian G4WWX** on **0151-722 1178**.

Members of the **Mid-Warwickshire Amateur Radio Society** hold their meetings on the 2nd and 4th Tuesdays in the month at 61 Emscote Road, Warwick, at 8pm. Contact **Don** on **(01926) 424465** for more information.

The **Mansfield Amateur Radio Society** hold their club meetings on the 2nd Monday of each month at the Polish Catholic Club, Windmill Lane, off Woodhouse Road, Mansfield, Notts at 7.30 for 8pm. **David Peat G0RDP** on **(01623) 631931** is the person to contact to find out more.

Members of the **Shefford & District Amateur Radio Society** meet at St Michael's Hall, Ampthill Road, Shefford on Thursday evenings (by the chip shop). Formal meetings start at 8pm and Morse code practice is from 7.30pm. For more details contact Derek Clarkson G4JLP on (01462) 851722.

The **Southend & District Radio Society** meet every Thursday evening at the Venture Scout Centre, 191 Eastern Avenue, Southend-on-Sea, from 8pm. For further details ring Alan G0TTM on (01268) 741229.

Members of the **Stourbridge & District Amateur Radio Society** meet on the 1st and 3rd Monday of the month at The Robin Woods Centre, Scotts Road entrance, off Enville Street, Stourbridge. All meetings begin promptly at 8pm. Find out more from **Gordon Bryant G0TZV** (Hon. Sec.) on **(01384) 395206**.

Meetings are held at the RAF Association HQ, New Kent Road, St Albans for the **Verulam Amateur Radio Club**. Contact **Walter Crane** on **(01923) 262180** for more details.

The **Yeovil Amateur Radio Club** meet every Thursday at 7.30pm at The Red Cross Centre, 72 Grove Avenue, Yeovil, Somerset. Contact **Malcolm Sadler** on **(01460) 54657** for more details on the club's activities.

RADIO DISCOVER THE BASICS

By Rob Mannion G3XFD

This month Rob G3XFD is 'back on course' after discussing a useful source of components last time. This time he's explaining the basics of generating electricity by chemical means and if you've got yourself a test meter you can join in!

In the March issue of *PW*, I discussed the basics of electron flow, and provided some comparisons using the 'pipe and tennis ball' analogy. This time I'm pressing on ahead to start explaining - in simple terms - the methods used to generate electron flow which are open to the every day radio enthusiast.

Basically speaking, the methods that can be practically used by the enthusiast include solar (from the sun via solar panels), chemical (via groups off cells forming batteries), heat (via thermocouples) and from mechanically rotating sources ('generators' either in the form of alternators or 'dynamos').

And by far the simplest - but certainly not the safest (if you use corrosive acids as the pioneers had to) is the primary cell. So, let's take a look at a modern method of reproducing the same effects **SAFELY** to create a primary cell.

The Primary Cell

The basic principle behind the primary cell is simple - it's controlled corrosion, **Fig. 1**. The necessary electrons are provided by immersing a metal in a corrosive fluid (usually a fairly strong solution of acid) and the metal dissolves fairly rapidly and in doing so many electrons are literally liberated by being 'torn' from their established 'orbits (see page 18 March issue) or are moved so as to effect others (see Fig. 2 March issue).

Unfortunately, 'primary cells' have distinct disadvantages. Firstly they use dangerous chemicals (**do not** on any account try to re-create the idea using acids. They can cause extremely serious burns!) and secondly they 'polarise'.

Polarisation is caused by the very same action which is dissolving the metal. As it dissolves, the metal and acid act together to form gases (the gases formed depend on the metals and corrosives used). And microscopic layers of the gas bubbles then build up on the electrodes in the battery (particularly on the + (positive) plate) and eventually cause a complete cessation of electron flow.

If the gas bubbles are removed, the electron flow could start again, only to stop again when the gas builds up once more. It's a problem that we have to live with basic 'batteries' and is the reason why 'dry batteries' (as used in torch or cassette player), particularly the basic (cheapest) 1.5V cell, 'seemingly 'recover' after a 'resting period'.

In the simple 1.5V volts cell, **Fig. 2**, only a very small layer of chemical, provides the 'dissolving action'. Much of the rest of the cell is filled with a compound which is there to absorb the gas produced as the metal providing the electrons is dissolved.

Making A Simple Cell

Fortunately, making a simple cell can be both safe, easy and amusing. All you need is a lemon or an orange, **Fig. 3**, (any acidic fruit will do, but the best results are obtained by using citrus fruits), a small sliver of copper printed circuit board laminate and a piece of zinc.

Copper washers can be an alternative for the p.c.b. material. If you cannot obtain a small piece of zinc, a galvanised nail will do (it's covered with zinc as a result of the 'Galvanising' action).

Now carefully pierce one end of the fruit with the copper electrode and place the other electrode (the nail) at the other end of the fruit. Connect the test probes of your test meter (you have bought one haven't you?), having previously set it to read the lowest current setting (probably, depending on the meter - around 5 milliamperes (mA) full scale deflection).

Once you have established that current is flowing, you should check the voltage and polarity (which end is negative and which end is positive). Next, try moving the electrodes about, and you'll find that the 'primary cell' output will vary. You may generate enough current to light a 1.5V bulb, but it will soon grow dim as the gas bubbles build up on the positive electrode.

The fruit may even get quite warm (especially if it's a fresh lemon!) as the chemical reaction takes place. But eventually the battery will stop working as the heat produced (even if it's only slightly warm to the touch) dries the lemon out.

So, there you have it - a simple cell. And you can even power a simple radio with such a supply. But whatever you do - don't try placing any acid fruit inside a radio receiver. Fruit acid can do a lot of damage inside a radio. (To check what I've said...squeeze a drop of lemon juice onto a piece of p.c.b. (copper side up) and see what happens in a few days!

Magnets & Electrons

Our simple 'fruit cell' developed direct current (it used to be called 'steady current' for obvious reasons), but by using magnets to initiate electron movement in a wire - you can generate electron flow using mechanical energy. I will show you how to do this next time.

In the meantime, I thoroughly recommend that you 'reinforce' what you learn by experimenting with the 'fruit cell' by looking through the 'further reading' ideas I've suggested previously. And for those of you who have bought the excellent new ARRL book *Understanding Basic Electronics*, I suggest you read the (short) Chapters 7 and 8. (*Understanding Basic Electronics* is available from the *PW* Book Store for £16.50).

Other useful sources to use to reinforce your practical experience include *Foundations Of Wireless* published by Iliffe (still available from libraries and widely sold secondhand) and the Common Core series *Basic Electricity* or *Basic Electronics*. The recommended reading list I've prepared is still available from the *PW* office on request.

So, until next time I'll say cheerio but before I do, I suggest you collect as many magnets as you can, and get some fine enamelled copper wire. You'll need them for the next stage when I explain how **YOU** can make a simple alternator.

PW

Heading Pic: A lemon and a battery despite being obviously different can both be used to generate electricity!

Fig. 1: Controlled corrosion is the basic principle behind the primary cell (see text).

Fig. 2: Cross section of a simple 1.5V dry cell.

Fig. 3: Making a simple cell is easy, all you need is an acidic fruit, a sliver of p.c.b. laminate and a galvanised nail (see text).

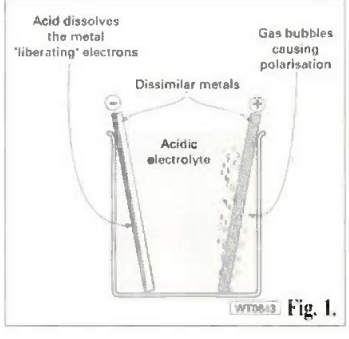


Fig. 1.

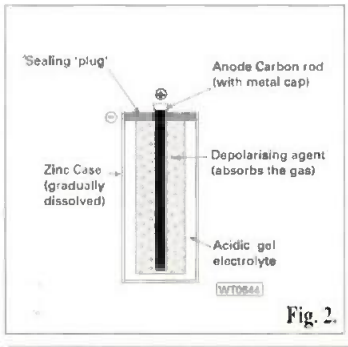


Fig. 2.

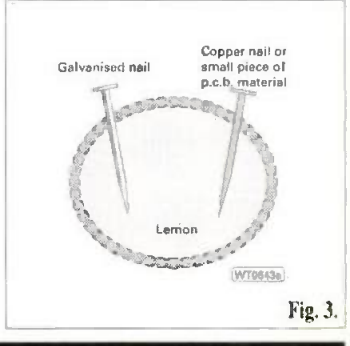
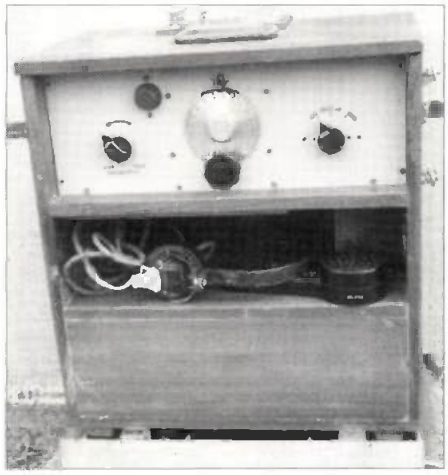


Fig. 3.

Crude but effective -

The No. 17 Transceiver



By Billy Williamson GM8MMA

Billy Williamson GM8MMA reminds us that not all military radio sets were highly sophisticated and recalls in particular the simple but effective No. 17 Transceiver.

Any mention of military radio usually conjures up visions of highly sophisticated, state-of-the-art equipment. Many of the radios built in the 1940s are still capable of giving modern equipment a run for its money, albeit at much greater size and weight.

Not all of the radios of the Second World War era were made to the same high standard, however. And surely one of the crudest of the time was the No.17 transceiver.

Searchlight Stations

The No. 17 transceiver was designed for use between search light station headquarters and detachments. It was housed in a wooden box measuring 16 x 15 x 9.5in.

The simple transceiver used only two valves, one AR6 and one ARP12. It was powered by two 60V h.t. batteries in series and a 2V accumulator.

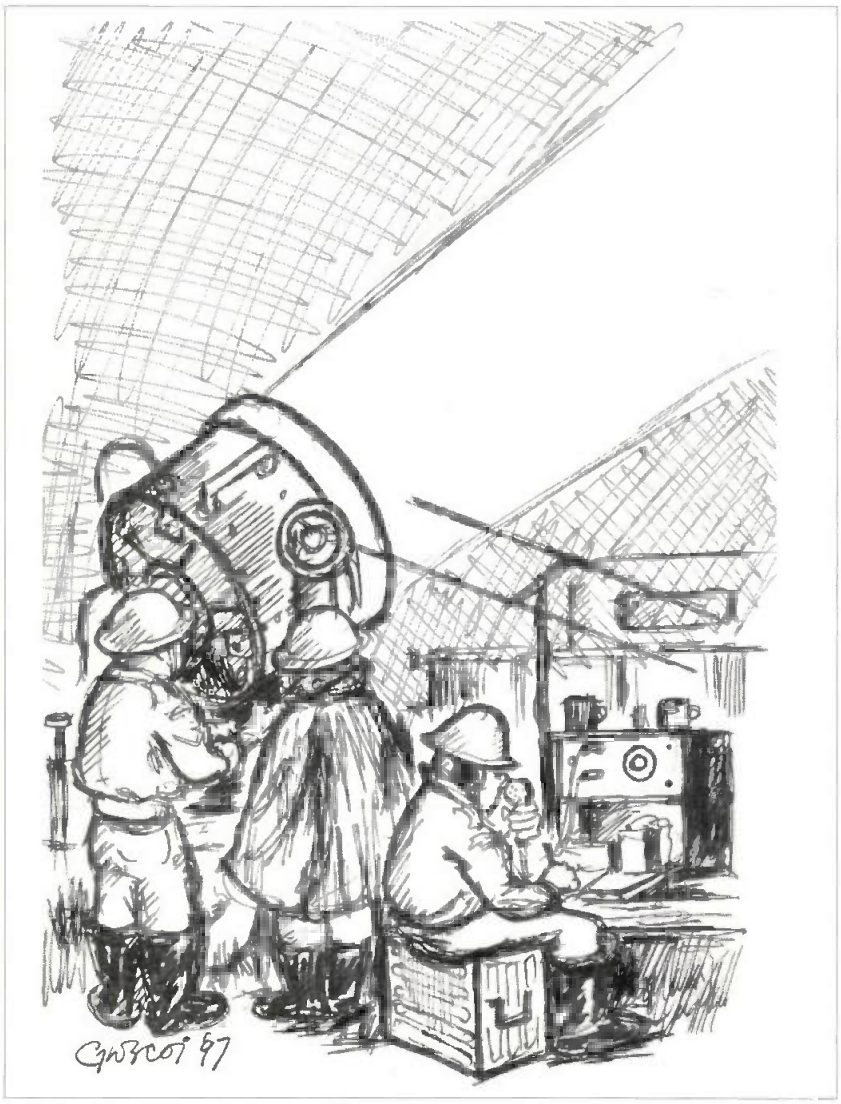
If a smaller version of the accumulator was used then the batteries could be fitted internally making the whole thing self-contained except for the antenna. Although it was hardly a walkie-talkie as it weighed around 40 pounds!

When the No. 17 set was used in receive mode the first valve acted as a self-quenched super-regenerative detector and the second as an audio amplifier. In the transmit mode the second valve was the speech amplifier and the first was a sort of oscillator and p.a. combined.

The transceiver could be tuned continuously over a range of 44 to 61MHz and the quoted output power was 0.3W!

Three types of antenna could be used with the No.17 set. These were a dipole, a dipole with reflector or a rhombic antenna. These were stated as giving ranges of 5, 13, and 24km respectively.

It was possible to increase the range slightly by connecting the dipole to the so-called special dipole terminal, although the manual sternly warns that this may cause interference to other stations and should only be resorted to in an emergency. There was also provision for what the manual describes as 'pin earth small'.



Heading Pic: Probably one of crudest sets of it's time, the No. 17 Set.

Only Three

In contrast to the bewildering array of knobs that were fitted to many Ex-WD radios of

the Second World War period there were only three controls on the No. 17 Set. These were a tuning knob, a three position switch off/receive/transmit, and a 'regeneration' control.

The dial was calibrated only in divisions so there was no indication of what frequency the set was actually tuned to. A wavemeter was available but from the brief details given it appears to have been an absorption type and so would not have been highly accurate.

The lack of calibration was perhaps less of a disadvantage than might be supposed. The selectivity of super-regenerative receivers was notoriously poor and the very basic coil arrangements must have allowed a large amount of transmitter splatter, so 'tuning-in' was probably not too difficult.

The No. 17 Set was housed in a wooden box and designed for use between searchlight station headquarters and detachments.

Effective Practice

So, just how effective were the No.17 transceivers in practice? In answer I know the receiver was quite sensitive. I used to be interested in long distance TV reception and used one to monitor TV Band I for Sporadic-E signals.

The receiver could be used today to monitor 50MHz but be warned even in receive the No.17 set radiates plenty of interference! But the simple circuit it used made it easy to tune to 70MHz.

I once tried some experiments on the 70MHz band. Contact was reliably maintained with one station at 4km, but another at 5.5km proved unworkable. Neither station was within line of sight.

Although often advertised in *Practical Wireless* and *Short Wave Magazine* it seems unlikely that the No. 17 Set was ever used by amateurs to any great extent. Apart from the inconvenient power supplies required, extensive modifications would have been needed to reduce the TVI to an acceptable level.

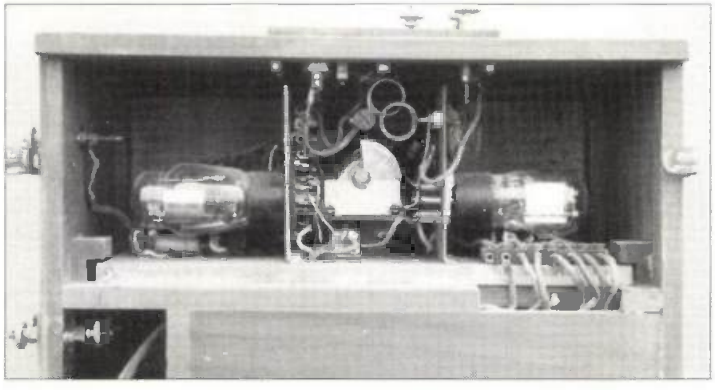
Why Made?

It's interesting to speculate as to why the No. 17 Sets were made in the way they were. They must have been cheap to produce of course, but the military have never been noted for trying to save money!

The speed of production may have played a part but it's likely that one of the main reasons was the need to conserve battery power. The 17 Set used only two valves, whereas a more conventional set-up of separate transmitter and superhet receiver would have required perhaps four times that number.

The advantages in battery economy are obvious and were probably thought to compensate for the relatively poor performance that the No.17 Set gave. Perhpas you know better? It would be interesting to hear from a '17' operator!

PW



Inside the No.17 Set, note the two valves and simple antenna coupling system.

antennas in action

Procom Handful

We've had a handful of **Procom** (of Denmark) catalogues featuring their antenna and related products. The catalogues are: Portable Antennas, Marine Antennas, Base Station Antennas, Mobile Antennas, Filters and Dual-band Mobile 50/144MHz Antennas. The Procom brand of antennas and ancillaries are available from

Communication Technical Services Ltd., Unit 15 The Gatwick Metro Centre, Balcombe Road, Horley, Surrey RH6 9GA. Tel: (01293) 822602 or on FAX: **(01293) 822602.**

Special Sale

Michael Hurst in our Book Store, after a tidy-up, has come across some copies of the *ARRL Antenna Book (17th edition)* that he thinks will be just right for readers of 'A-i-A'. As a special offer he's knocked £5.00 off the price of the book if you order it now. Instead of costing £21.95 +£1 P&P, readers can have a copy for **£16.95+£1 P&P** - a saving of £5.00 over the normal price.

To get your copy of *ARRL Antenna Book (17th edition)* use the form on page 90 of this magazine, or call **(01202) 659930** to place your order. Not to be missed at that price!

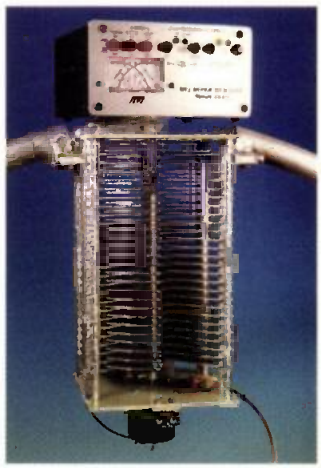
Three From W&S

Along with a new Tonna F9FT catalogue comes two items from the MFJ stables, all available from **Waters & Stanton**. The MFJ items are: the MFJ-969 Versa Tuner II antenna matching unit and the MFJ-1788 Tuned loop antenna.

The New Versa Tuner II is just right for the new breed of h.f.+50MHz rigs such as the Icom IC-706 and the Alinco DX-70. With coverage of 1.8 to over 50MHz the MFJ-969 can cope with 300 watts of power due to an air-cored multi-turn roller-coaster inductor. Complete with an inbuilt 4:1 balun for balanced feeder antennas and a dummy load the Versa Tuner II is available for £179.

On h.f. the MFJ-1788 loop antenna (developed from the successful MFJ-1786) covers 14 to 21MHz. With a remote control unit the huge butterfly tuning capacitor covers the bands with ease. Being capable of loft mounting the antenna is suitable for areas where no outside antennas are allowed. The MFJ-1788 with full mounting kit, costs £349 including the p.s.u. and control/s.w.r. meter box.

All of the above are available from **Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS**. Or you can use their freephone number **(0500) 737388**.



The enormous butterfly capacitor on the MFJ-188 Loop Antenna.

welcome to AiA!

Welcome to another issue of 'Antennas in Action', the bi-monthly section of *Practical Wireless* featuring radio related items that start after the r.f. output socket of your rig: be it cable, feeder, accessory or antenna.

This month in 'Antenna Workshop', **David Butler G4ASR** tells you the advantages of, and how to intergrate coaxial relays into your antenna set-up, while **Jack King G4EMC** says 'Old antennas never die'. To fill in the rest of course there's some A-i-A news, and I start 'Tex Topics' by giving away the first copy of *More Out Of Thin Air*, before turning to follow up ideas about previous 'A-i-A' articles.

But don't forget, to make 'A-i-A' successful, we want your ideas. The first idea has been rewarded. Will your idea be the next one? If you don't write in, it will never be!

G1TEX

contents

8 pages of antennas

old antennas never

Jack King G4EMC describes how, with perseverance and a little bit of luck, a 'piece of junk' has been resurrected to become an excellent antenna system.

I moved to my present location, about 17 years ago, and I also had the opportunity to make a few changes to my antenna system. During the alterations, I made up a couple of brackets and bolted them to the gable end of the house. The bracket supported a length of aluminium scaffold pole.

The scaffold pole supported the middle point of an h.f. trap dipole and a home-brew two element electrically steerable vertical for 144MHz (2m). A little while after these changes, I was fortunate in obtaining an elderly rotator so, the old scaffold pole was changed to a six metre length of aluminium pole, and re-mounted on self-aligning bearings.

With the help of **Peter G3ORP**, a small home-brew two element beam for 14 and 28MHz was designed and constructed. Until it was destroyed in a storm the new antenna worked fairly well, despite its attention from birds (and the subsequent damage!). At the same time a home-made 144MHz 5λ/8 vertical was mounted on a stub mast attached to the top bracket. Almost immediately a problem was noted, in that raising and lowering the pole with the antennas fitted needed not only a long ladder but also a good friend (or two) with a head for heights!

Storms and strong winds destroyed my original beam so, I decided its replacement would be a new Altron Mini-beam. This antenna worked quite well to VK whilst the sunspots were evident. Then the 1987 gales hit us, the pole took on a very funny shape, and the Altron suffered broken spokes and other damage, when it was turned into a floppy vertical array!

It was obvious that something needed to be done. Having obtained 'planning permission' from the XYL, the mess was removed from the gable end. After deliberation a wall mounted telescopic system, designed to tilt from the base, at an angle of about 10°, across the drive, was commissioned from **Norrie Brown** of **Tennamast**.

The Mini-beam antenna was refurbished, and with a new rotator obtained at the Pickets Lock show, up it all went. The antenna farm grew - the new mast was supporting not only the Altron antenna but also a second-hand 8x8 Jbeam for v.h.f. DX, with the home-brew 5λ/8 for 144MHz on top for local working. The h.f. trap dipole was changed to a home-made G5RV, so that 1.8MHz (Top-Band) could be tuned, by strapping the feeder. Soon after, I had a letter from the local council. Someone had complained about the mast and beams. It was in fact no higher than before, but it was about four metres closer to the back door.

When the council official came to view the "Beastly thing", and having realised that I'd been using the same beam for the last nine years or so, all was well. (Yes time flies when you are having fun!). The old bent scaffold pole was recycled by cutting it into two, one half concreted into a corner of the front garden, and the rest, minus the kinky bend clamped to it to support one end of the G5RV. I decided to apply for full (council) planning permission on all the masts, including a home-brew 12.5m high tilting mast in the back garden. All went extremely well, the only problem to be resolved was deciding what colour to paint the pole in the front garden!

Maidstone YMCA

Some years before, I had been a member of the **Maidstone YMCA** radio club, upon whose three section mast was mounted a three element h.f. beam. This beam, apparently had not been working very well, but one day, upon starting to raise the mast, the hoist cable snapped, and down it all came in a rush. Needless to say the rotator cage floor got a bit bent, and the 3-ele antenna too! It was decided to scrap the beam, and buy a new one. I remember helping to take the broken bits apart, and watched as they were removed for scrapping.

Several years later, the member who had taken the 'junk' away, rang to ask if I wanted the bits of scrap beam he had just found under the weeds behind his duck pen. The 'bits' hadn't reached the scrap heap, and the surviving parts duly arrived, and were taken apart and carefully examined. Apart from quite a bit of mess, the elements looked straight, and came apart fairly well. The driven traps were taken apart, and found to have 'Mosley USA' covers on the ends.

A letter was sent off to **Mosley USA** to try to identify it, and get details, to this day, I am still waiting for a reply. Careful measurements of the trap diameters, lengths, etc., were sent also to Mosley UK who revealed that they thought it might be a Mosley Mustang T33. A booklet from Mosely containing a spares list and prices, showed that the same antenna and parts were still available. Since then I have found that the beam is actually the 'MP' (more power) version, with heavier gauge wire in the traps on the driven elements. It should certainly handle the power I can put into it!

All four driven element trap end seals were loose, and looked perished, some corrosion had taken place on the thin alloy trap tubes, both internally and externally. The coils themselves were

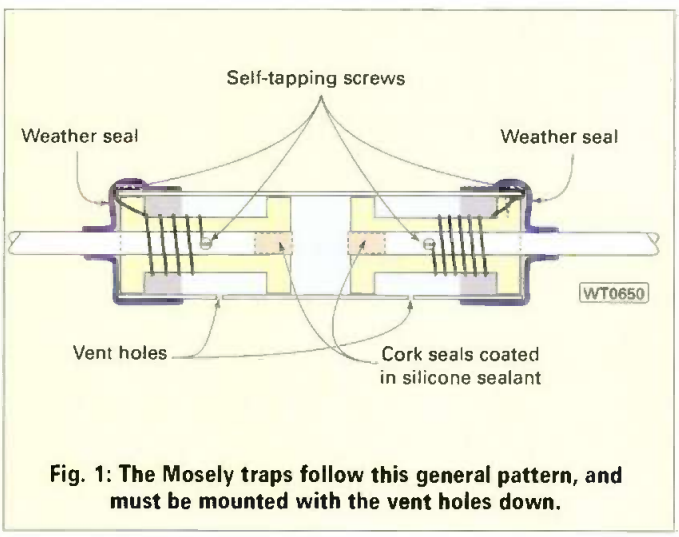


Fig. 1: The Mosely traps follow this general pattern, and must be mounted with the vent holes down.

die

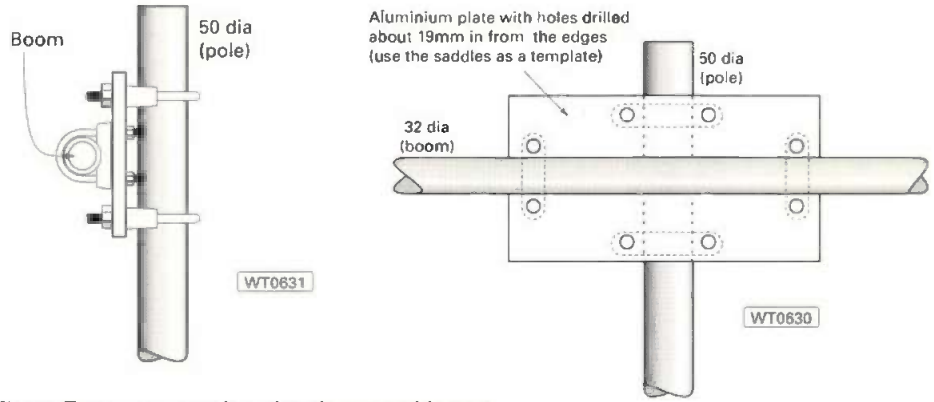


Fig. 2: The new mounting plate in general layout.

all complete, and the sealing varnish was all but gone. But on dismantling the antenna further, the self-tapping screws clamping the coils, were found to be rusty. This of course gave a high resistance reading on an ohmmeter, perhaps that's why it didn't work too well before!

The traps, shown in **Fig. 1**, were left for some weeks against a hot radiator in the shack to thoroughly dry out, assuming that during the years under the weeds, damp could have penetrated into the formers, altering their resonant frequencies. The director and reflector traps, are designed to be hermetically sealed to prevent damp getting in and altering their resonant frequencies. The end seals on these were in a worse state than the driven ones, so each assembly was taken apart, thoroughly cleaned and dried in the same way. The screws on these too were rather corroded.

Once all the trap formers and coils were thought to be thoroughly dry, they were given a coat of light lacquer varnish, and the ends of the tubes resealed with outdoor silicon sealer. New trap end seals, which are now made from a thermo-plastic material were obtained from Mosley. These were softened in boiling water, as recommended and then moulded over the end of the trap tubes. The renovated traps should be weather resistant and ultra-violet light proof too. The alloy elements were well rubbed down with a very fine abrasive paper, and a stiff wire brush.

All the old varnish and corrosion was removed. A light coat of grey primer has taken off the 'shiny new' look, which might catch the eye of passers by, who might take fright and make a fuss to the powers that be! A square block of insulating material was purchased, and new driven element supports made, tapping out the holes to eight millimetres. A new length of 1.25in (32) diameter aluminium boom was purchased, and a new rectangular mounting plate was made from a piece of aluminium plate, of approximately 200x150mm. This new plate was drilled to take two suitable exhaust clamps and two, 50mm exhaust clamps to mount the beam onto the mast as shown in **Fig. 2**.

I had to wait some time, as the weather left a lot to be desired, before I could actually assemble it and try my luck! However, the opportunity eventually arrived, and now the resurrected collection of bits is now in situ and working. A few minor adjustments need to be made to improve the matching on 14MHz, but 21, and 28MHz are quite respectable. The overall dimensions are as shown in **Fig. 3**.

Should you be fortunate in obtaining what looks like a load of scrap bits, from a junk sale, boot fair or wherever, take a little time to assess what you have and the possibilities of resurrecting it. As the title says, "Old antennas never die". Being mostly made from aluminium, they certainly don't rust away! I now have, to all intents and purposes, an almost brand new full sized three element beam for 14, 21 and 28MHz, at a far less cost than beams that are available new. With the Sun spot cycle at its lowest level at the present time, things can only improve.

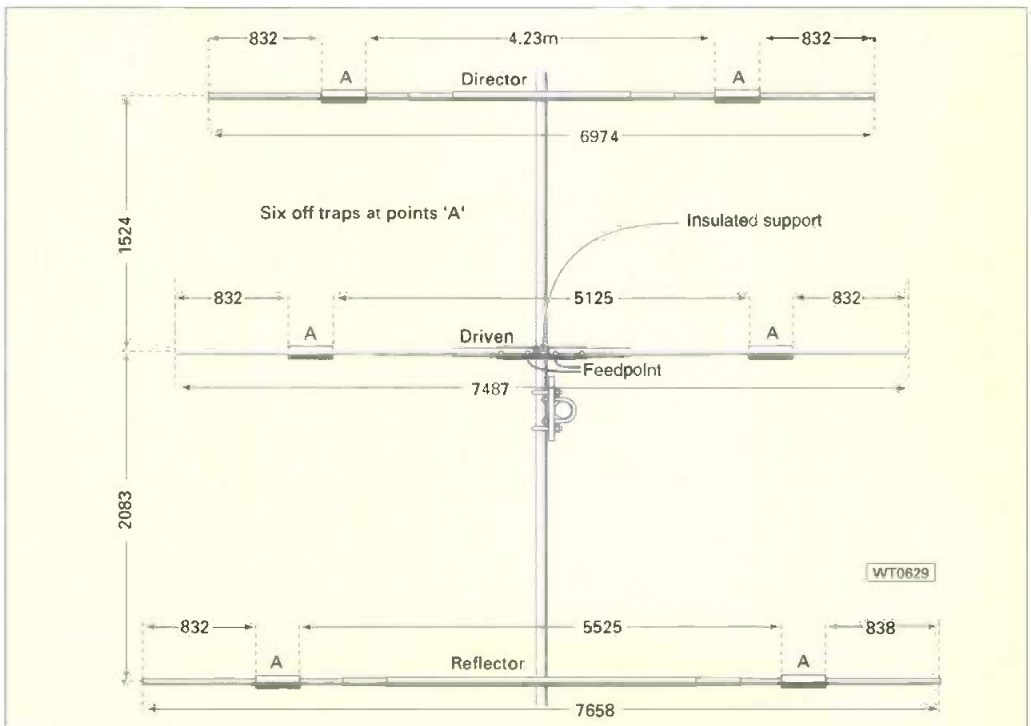


Fig. 3: Basic dimensions of the old antenna that Jack G4EMC 'inherited'. It turned out to be a Mosely Mustang T33.

DAVID BUTLER G4ASR SHOWS YOU HOW THE HUMBLE ANTENNA SWITCHING RELAY CAN HAVE MANY CLEVER USES.

antenna workshop

David Butler G4ASR tells you how to choose a coaxial relay and integrate it correctly within a v.h.f. or u.h.f. antenna system.

I'm going to take a look at one very important component that's often found in an antenna system. I refer to the humble antenna switching relay. Simple it may be but it can have clever uses!

A relay consists of an electromagnetic coil controlling a switching mechanism. A signal energises an electromagnet which attracts a hinged and spring-loaded element called an armature. Output contacts attached to, but insulated from the armature, are opened and closed by movement of the armature. There are many different types of relays of differing shapes and sizes. Some switch signal level voltages, some switch power (a.c. or d.c.) and some switch radio frequency (r.f.) signals. However, the type I'm looking at this time is the electromechanical coaxial relay specifically designed to handle v.h.f., u.h.f. and microwave frequencies.

Coaxial relays are readily identified as an r.f. switching device because, unlike other (low frequency) relays, they usually have coaxial sockets mounted on the body of the relay. Some types of relays have three sockets, other types (transfer relays) have four such sockets, although some relays don't have any sockets at all. This latter type is designed so that coaxial cables can be connected directly into the relay.

Characteristic Impedance

Coaxial relays are constructed so that they maintain a characteristic impedance to match the coaxial cable used in an antenna system. You may ask why is that? The answer is that if you were to use a normal d.c. switching relay in your v.h.f. antenna system the (voltage) standing wave ratio (s.w.r.) could become very high, producing reflections in the feeder system. This high mismatch may cause the transmitter amplifier to fail, particularly if it uses a semiconductor device. Similarly high values of s.w.r. are not recommended on the receive path as this may introduce additional front-end losses.

The most basic use of a coaxial relay is to switch an antenna between a receiver and transmitter. I can hear the question "why are 'normal' relays used inside most modern v.h.f./u.h.f. transceivers?" Well it's a juggling act, by the

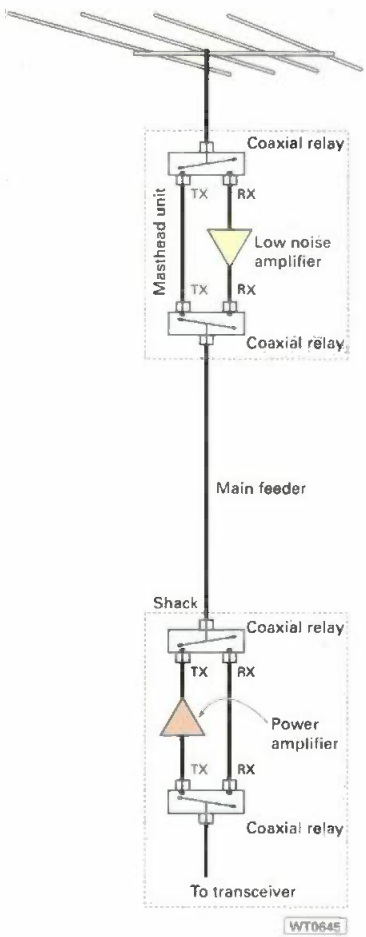


Fig. 1: Using four coaxial relays with one single feeder line to the masthead unit and antenna.

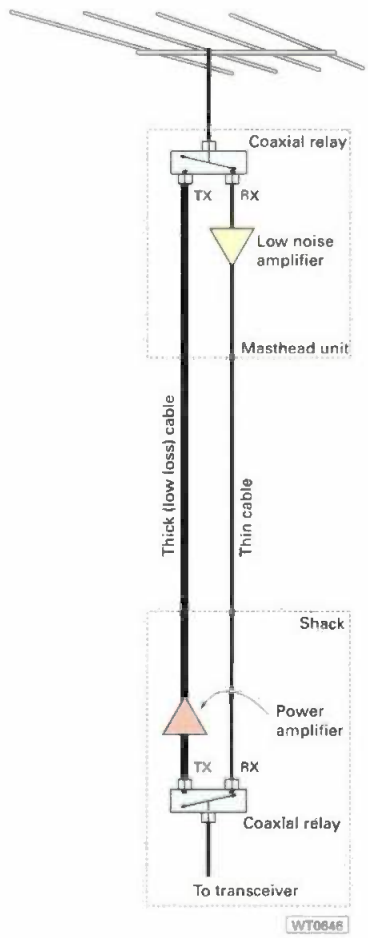


Fig. 2: Using two separate coaxial cables saves two coaxial relays

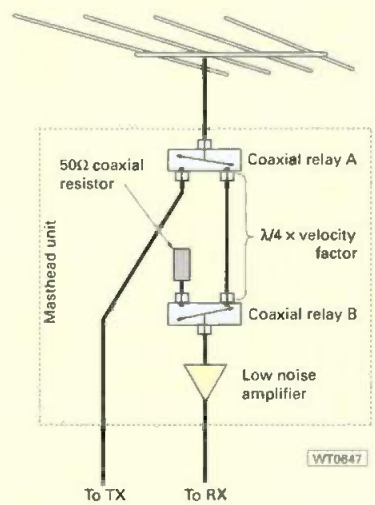


Fig. 3: Using a second small small coaxial relay at the masthead gives a measure of r.f. protection for the low noise pre-amplifier.

The most basic use of a coaxial relay is to switch an antenna between a receiver and transmitter. I can hear the question "why are 'normal' relays used inside most modern v.h.f./u.h.f. transceivers?" Well it's a juggling act, by the

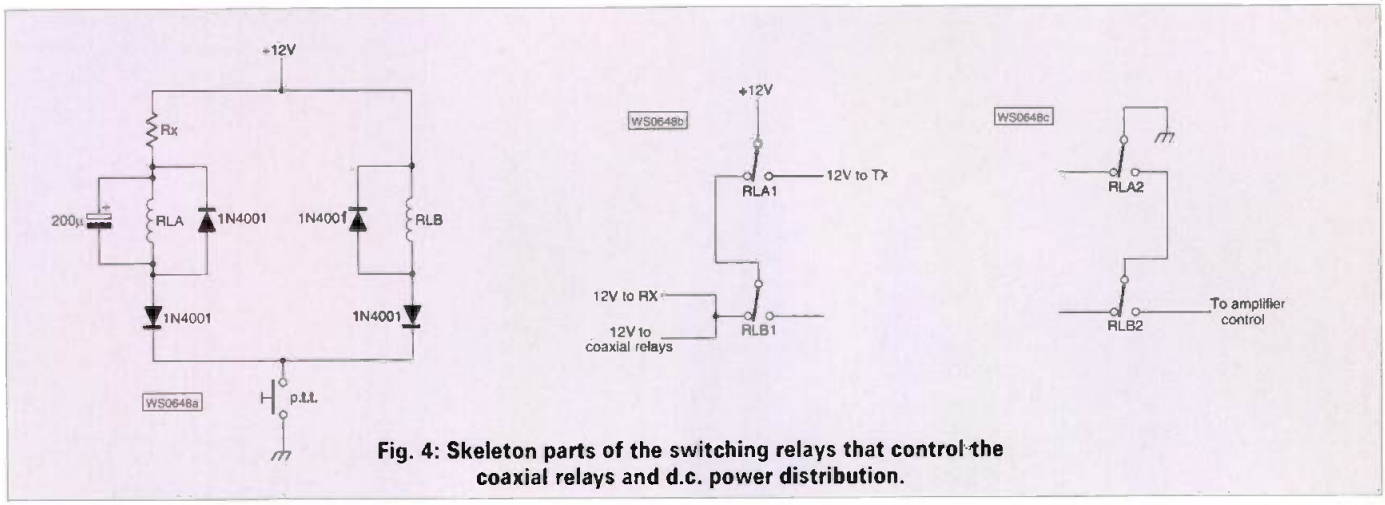


Fig. 4: Skeleton parts of the switching relays that control the coaxial relays and d.c. power distribution.

manufacturer, between an acceptable receiver performance and commercial profit. So, providing the relay has a vaguely strip-line construction (allowing operation up to u.h.f.) and switching is limited to low power they can get away with it.

Because of their low mismatch, coaxial relays are commonly used in weak-signal (s.s.b. and c.w.) operations to switch parts of the antenna system in or out of circuit. So, if you intend to use a separate power amplifier (p.a.) or mast-head low noise amplifier (l.n.a.) you'll need an external coaxial relay to control the system. You also need to use it correctly to save blowing up your expensive l.n.a. Other applications for coaxial relays include the switching of transverters in and out of circuit or even switching different v.h.f./u.h.f. antennas down one piece of coaxial cable.

Important Considerations

Whatever you intend switching, there are several important considerations you need to think about when choosing a coaxial relay. The factors are: impedance, v.s.w.r., isolation, insertion loss, power handling, switching time, r.f. connectors, coil voltage and auxiliary contacts.

Let's look at the impedance first. Most coaxial relays are normally designed with an **impedance** of 50Ω. But beware though, there are other types, such as 75Ω, also available (and often inadvertently bought at rallies!). There's always a residual mismatch introduced by even the best relay. It can be caused by impedance

discontinuities in the sockets and switching blade. The mismatch of a coaxial relay varies with frequency, but the closer to 1:1 (s.w.r.) in your chosen band, the better.

Insertion loss is defined as the loss measured between the two active ports in a switched path. The insertion loss also varies with frequency, rising as the frequency rises. Typical figures (for a surplus relay) could be 0.1dB at 50MHz rising to 0.8dB at 430MHz. Obviously the lower the insertion loss the better.

The **power handling** capability, a very important specification, is often specified as the maximum power handling at a number of frequencies. As the frequency increases so the power handling reduces. For example, one coaxial relay currently advertised is capable of handling a power of 400W at 30MHz may handle only 20W at 1.2GHz. Be aware that there are two ways of specifying power handling, **'through power'** and **'switching power'** and there's a considerable difference between the two. A relay capable of withstanding in excess of 500W of through power may only have a switching power of 100W or less.

Now let's consider **isolation**, especially if you propose switching r.f. around a mast-head l.n.a. then this parameter becomes very important. **No coaxial relay is perfect** and when an active transmitter is switched to the antenna there will be always be some measurable r.f. present at the receive port. The isolation (sometimes called crosstalk) between ports in a coaxial relay is measured in decibels. If you apply 500W to a relay having an isolation of 30dB then 500mW will be present at the receive port. More than enough to destroy your low noise amplifier!

The isolation parameter is also frequency dependent. So as you move up in frequency, the isolation degrades. For high power operation you need to select a relay that has at least 50dB of isolation. However a word of warning. Isolation is normally measured with all relay ports terminated in 50Ω. So the actual isolation may be poorer, as it's unlikely that the receive port will have a non-reactive 50Ω load.

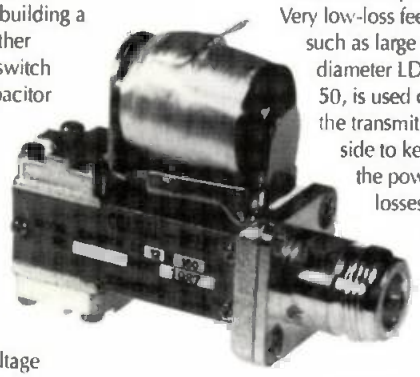
Switching time: Depending on your specific application it may be necessary to determine the switching time of the relay. This is the time taken for the relay to go from one position to another. It usually lies in the range between 10 to 100ms. Switching time can be important for some digital modes of operation. It is also a factor that needs thinking about if you are contemplating building a sequential transmit/receive changeover system.

Connectors: Quality connectors are essential to ensure adequate power handling and low s.w.r. ratings at the frequency in use, with N-type connectors a good choice up to the middle microwave bands. Relays with SMA connectors are an ideal choice for all microwave operation. That's because their design is normally optimised and consequently have a low v.s.w.r. in the microwave region. I think you should steer clear of coaxial relays that use BNC or SO239 connectors particularly if you are going to use

All the coaxial relays shown are available from Piper Communications, 4 Severn Road, Chilton, Didcot, Oxon OX11 0PW. Tel: (01235) 834328.

them above 144MHz.

Coil voltage: Many relays operate from a 12V supply which is very convenient when interfacing with current equipment. Some relays however, particularly those used for microwave operation may have a 24V coil. So you should ask when buying a surplus relay. It's a fairly simple matter though of building a voltage doubler, but another cunning technique is to switch into the coil circuit a capacitor charged to a value of around 12V. This may be added (temporarily) in series with the 12V supply to the coaxial relay. The technique relies on the principle that although 24V is required to pull in an armature, the holding voltage can be considerably less.



If you can afford them, then I'd recommend that you obtain a coaxial relays that have an auxiliary set of d.c. switching contacts (**tell-back contacts**). These contacts can be used to control other parts of the station system during the switching process (see below for an explanation).

How To Integrate

Now it's time to look at how to integrate it into your antenna system. There are many combinations depending on whether you have a separate power amplifier and (or) a pre-amplifier located at the antenna, in the shack or don't have one at all. One typical, but slightly messy configuration, is shown in the diagram, **Fig. 1**. It requires the use of four coaxial relays, although two may already be present in a commercial l.n.a. Ensure that the coaxial relays around the l.n.a. rest in the straight-through path when in the un-energised state.

The layout in Fig. 1 has two advantages. If there's lightning static present (when you're not in the shack) it can reduce the risk of damaging the l.n.a. and should either coaxial relay or the l.n.a. should fail then you can still utilise the main feeder to keep you on the air until repairs can be made. One disadvantage of this system is that some commercial l.n.a.s are unable to handle power approaching the legal limit and additional front-end receiver losses will be added by the switching around the power amplifier.

The diagram in **Fig. 2** shows an 'optimised' system that many serious DXers prefer to adopt. A high quality coaxial relay is located close to the antenna feed point. Very low-loss feeder, such as large diameter LDF5-50, is used on the transmit side to keep the power losses to an absolute minimum. The l.n.a. is mounted at the mast-head, to eliminate feeder losses. The receive feeder can now be slightly higher loss as all the front-end sensitivity and gain is provided by the pre-amplifier.

Even so, most DXers will still use a reasonably good cable for the receive path. Ideally the main station transceiver should have separate r.f. connectors for transmit and receive but this may not always be achievable. So you may need to use another quality coaxial relay in the shack to switch between the receive and transmit feeders.

Very Expensive

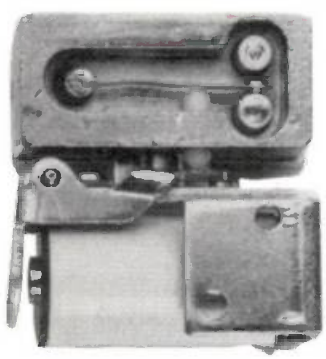
If you can afford it then buy a high quality relay with 60dB of isolation and 2kW through power handling but be warned that it will be very expensive. If like me, money doesn't grow on trees, then you'll need to provide some additional form of protection for both your coaxial relay and pre-amplifier. This is particularly important if you are considering running high r.f. power on v.h.f. or even moderate power on the u.h.f. or microwave bands. The diagram, **Fig. 3**, shows one method of protecting the l.n.a. from excessive r.f. power.

The main switching relay A, needs to be able to handle the through r.f. power you are going to apply to it. Relay B, can be very small (as it doesn't handle any power) and is used to provide the additional isolation required to protect the l.n.a. A 50Ω load is connected to one port so that when transmitting the l.n.a. input is correctly terminated. To achieve maximum isolation with the two relays you need to join them together with a cable one quarter wavelength long at the frequency band in use. The actual length isn't too critical but you'll need to consider the velocity factor of the cable and make some estimate of the effective lengths inside relay A and relay B.

To protect your main coaxial relay (and l.n.a.) you must never switch between transmit and receive with high r.f. power present. This is called 'hot' switching and failure to observe this requirement will lead to arcing and serious damage to the relay contacts. In a typical station consisting of a transceiver, a power amplifier and changeover relay (often co-located in the p.a.), when you push the press to talk (p.t.t.) button on your microphone or hit the morse key everything flies into action simultaneously. Power is being generated before the coaxial relay contacts stop bouncing. In many cases r.f. will be present before the relay has actually closed. Is it any wonder relay contacts are burned and the pre-amplifiers often become dummy loads!

Sequential Switching

A method of control called 'sequential switching' should therefore be used. When changing from receive to transmit events should occur in the following sequence. Turn off the receiver, change over the coaxial relay(s), turn on the drive and energise the amplifier. Similarly when going from transmit to receive the amplifier should be turned off first. Then the drive disconnected, the coaxial relays changed back and finally the receiver turned back on.



The circuit in **Fig. 4** shows a very simple sequential control system. It has no fail safe mechanism to confirm that the coaxial relays have changed over but it does provide separate switched +12V feeds to the receiver and transmitter (if required) and controls the coaxial relays and amplifier in a sequential way. The coaxial relays are energised on receive as I mentioned earlier. When the p.t.t. line is grounded RLB switches over quickly disconnecting the 12V feed to the receiver and changing over the coaxial relays to the transmit configuration. Relay RLA, delayed by the action of the 200µF capacitor, then switches over providing the 12V feed to the transmitter and providing an earth feed to control the amplifier. I'll leave it to you to work out what happens when the p.t.t. button is released! Please note however, that these relays are not the coaxial relays, but the control ones switching d.c. power only.

That's it for this time. If you have any queries or suggestions please contact me at the address given in my 'VHF Report' column elsewhere in the magazine. Until next time.....Good DXing!

win..win..

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A SIMPLE ANTENNA, A PREVIOUS ANTENNA AND A LENGTHENED ANTENNA ALL FEATURE THIS MONTH.

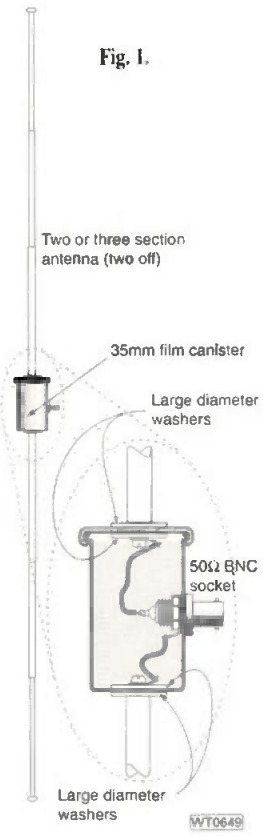
tex topics

IN THIS MONTH'S 'TEX TOPICS' I HAVE THE PLEASURE OF GIVING AWAY THE FIRST COPY OF *MORE OUT OF THIN AIR* TO DAVID G0LZW FOR AN IDEA FOR A SIMPLE DIPOLE ANTENNA FOR V.H.F. WORKING. LESS PLEASURABLE THOUGH, IS THAT I MUST ADMIT TO A SLIGHT 'TERMINOLOGICAL INEXACTITUDE' (NO! NOT A HOUSE OF COMMONS FIB, BUT THE WRONG USE OF A TECHNICAL TERM). I FIND A BOOK THAT I CAN RECOMMEND, AS IT ANSWERS MANY QUESTIONS ON BALUNS. AND FINALLY I ALSO HAVE TO ASK FOR HELP ON A LOADING COIL QUERY. - SO READ ON.

Back in the first 'A-i-A' in January of this year I said that I would be giving away copies of *More Out Of Thin Air* to the authors of the best idea published each month. And it is my pleasure to be sending a copy out to David Riddick G0LZW of St Albans for his simple idea for reusing telescopic antennas from portable radios. The general idea is shown in **Fig. 1**. All you need is a 35mm film canister, which you can probably get by the bucketful from your local film processors, and two telescopic antennas of at least λ/4 at the band you're interested in (about 500mm for 144MHz or some 300mm for 430MHz). David says that the large diameter washers are necessary to provide extra support. He also used a curved ' washer' under the BNC socket to stop it slipping around in use. The method of use says David is to adjust the two rods equally until you have a low s.w.r. then glue, stick or tape the elements in place and it's ready for use. Then the finished and trimmed unit may be hung up in a corner.

I've used a similar method, for a simple 50MHz antenna, using two 1.5m antennas from an old short wave radio David, but they needed something a little stronger to hold them in place. I also see no problem in using two antennas a little over a metre long for 70MHz either although I haven't tried it myself. If you don't want to use a BNC socket then a short length of 50Ω coaxial cable through the sidewall of the canister will be adequate.

Fig. 1.



The T2FD Antenna

The article on the T2FD antenna, by **Glen Ross G8MWR**, in the March 1997 issue of 'Antennas-in-Action' has created a heavy postbag, which pleases me as it shows that the section is being read. Keep up the good work! The T2FD antenna has been around since the late 1940s when Capt. G. L Countryman W3HH described a series of experiments that he, and others, carried out on the 'Terminated Folded Dipole'. (W3HH's original article appeared on page 54 of *QST* for June 1949).

I'm indebted to **Roy GW3KZW**, for photocopies of two subsequent article about the antenna, along with results of his own experiments: "However, I must say that when I tried a T2FD, constructed to the given criteria, at any given frequency, the performance on both TX and RX was some 30dB down, relative to a plastic banana, despite the claims". That would seem to put the opposing view most succinctly I believe - unless you know better!

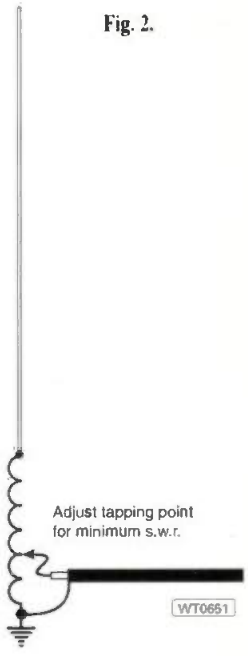
Whilst on the subject of the T2FD antenna, I had letter from **John Heys G3BDQ**, who has also covered the T2FD antenna in his *Practical Wire Antennas* book noted that he managed to get hold of an ex-services 400Ω resistor although it was expensive. But he had also made up a load using 24 two watt carbon film resistors that had coped well with s.s.b. transmissions of 300W. He also said that using 450Ω ladder twin and a balanced a.t.u. was the preferred option as far as he was concerned.

John also mentioned that another 'easy' possibility was to use 600Ω twin feeder and a 600Ω load, again using a balanced a.t.u. He said that he wouldn't recommend using lower resistance loads as their values become critical. John also confirmed that the values shown in Fig. 2 of Glen's article are those suggested in 1953 by W3HH himself, and that coaxial cable shouldn't be used to feed the antenna directly. My thanks for the long letter John, and yes I could read your scribble.

Another article that has generated much post was the 'High as a Kite' article on Pages 30 and 31 of the May 1997 issue of 'A-i-A'. Unfortunately for me (as Editor) most of them have taken me to task for using the terms of 'Balun' for the impedance matching transformer shown in Fig. 4 on page 31. **Alan G3TAY** said 'The balun diagram is incorrect, the unbalanced socket is connected the reverse way round. For the best unbalanced to balanced output the centre connection (*of the coaxial cable*) should go to the connection marked 'a' (in Fig. 3) and the outer connection to 'c'.

The same ideas were penned by **Tony G3NXC**, who noted that a similar item in another article by John Heys G3BDQ, in the same issue was correctly termed as an impedance transformer. Tony mentioned that in the 'High as a Kite' project a balun is desired as the antenna is balanced, and that a balun does not necessarily provide an impedance transformation. Conversely an impedance transformer does not provide conversion from balance to unbalanced. And I have to agree with you Tony that in a technical hobby the accuracy of a statement (or article) is a must if it is to be used to inform. *Mea Culpa*! That one should not have slipped through.

Fig. 2.



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tex topics

antennas in action

Now An E-Mail

An E-mail from **Peter G4CRY** arrived on my desk with a variety of comments and queries for 'A-i-A'. In the E-mail Peter says: "I think I understand why we need a balun and in theory you should use one when feeding a dipole with coaxial cable but I find that there does not seem to be any need the dipole works very well without it. If I was using coaxial cable from the TX out to the garden and then balanced feeder up to the dipole, I would use a balun where the twin feeder and coaxial cable join". That is the correct *theoretical point* to fit a balun Peter, but it depends on the actual location and surroundings that can distort the antenna radiation pattern as to whether it make very much difference at any particular location.

Peter then says: "Now I know, from the readings from my MFJ-259 antenna analyser that the impedance of various antennas at resonance can be anything but 60Ω (or whatever) so you might need either an impedance transformer or a balun or both to feed such an antenna. I have seen designs for a 1:1 and 1:4 antenna but I see there is a design for a 1:6 balun in the May issue. Can baluns be any ratio at all? If so, how do I design one?"

Highly Recommended

In answer to Peter's question (and bearing in mind the comments made by Tony G3NXC) baluns may have any impedance ratio and may be designed to give (almost) any transformation ratio desired. I can highly recommend the book *Building and Using Baluns and Ununs* by **Jerry Sevik W2FMI**. This is a splendid book for anyone interested in this type of matching device. With more than 120 pages of data and designs to suit most circumstances. And judging by the fact that most of the designs feature a ferrite core of some description, Jerry doesn't think that saturation is going to be a problem.

Peter's other question "Would it be possible to build a variable ratio balun?" is a splendid one though. The answer - Yes, but it would be difficult keeping the balancing correct as the turns ratio was changed. I suppose that the nearest thing would be the variometer tuner described by **Anthony Langton GM4HTU** on pages 58 and 59 of the November 1996 issue of *Practical Wireless*. But even the variometer has a limited 'transformation' ratio available. The variometer however, has a balanced output though, by virtue of the the fact that the secondary winding is completely separate from the primary.

Another problem Peter is experiencing is with a half wave vertical for 14MHz that was feature in John Heys' Book *Practical Wire Antennas*. After adapting the 'Jumbo Jay' design Peter is having great difficulty getting the tuned feeder part to work properly. Perhaps one of our readers may have an answer and would like to share it with us all. Over to you readers!

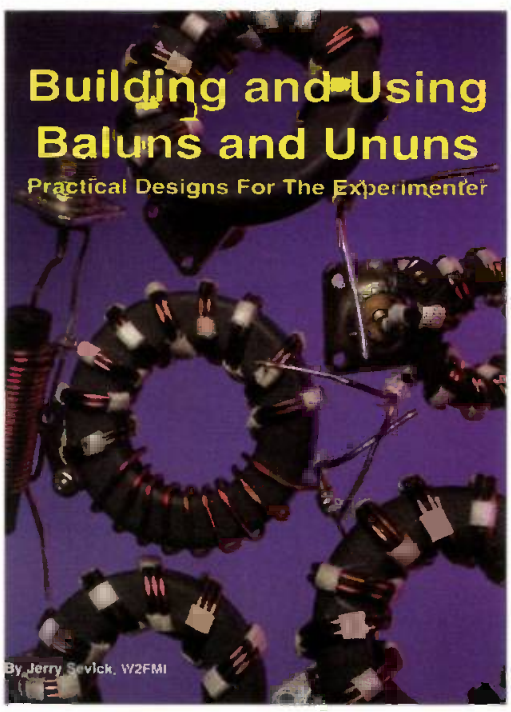
Base Loading Coils

'Antennas-in Action' reader **Gordon Lines G0ROH** has asked for some information about base loading coils on low-band vertical antennas. He asked specifically "How do you calculate the inductance of a coil (in μH) to bring a short antenna combination back into resonance at a particular frequency?"

And I have to admit Gordon I've come up against a brick wall here. All the books I've consulted (and there are many in my library) all confirm that a loading coil placed in the lower part of any length of antenna element will alter its resonant length - but none of them are definitive. But first let's look at the problem itself.

One of the main problems of operating on the lower h.f. bands is that few amateurs have a large area to put up something like a full-sized G5RV or a Zepp for 'Top-Band' or even 3.5MHz. So many are constrained to using some form of vertical antenna. But a vertical for even 14MHz is some five metres high, for 7MHz it's 10m and for 1.8MHz an unthinkable 40+m high. So we must find a way of artificially 'lengthening' a vertical element.

There are two traditional ways of making an antenna seem longer than it is. A 'capacity hat' at the top - or a loading coil at the bottom (or sometimes the middle). There is of course the compromise solution of using both methods together, but that is quite 'messy' from a simple design point-of-view. I have found formulae to calculate the inductance of a straight length conductor, and I've found formulae to calculate the capacitance of a conductor (to free-space). But I cannot find a definitive answer to this particular problem.



In the 1983 Prentice-Hall book *Radio Antennas* by **Stephen Gibson** (ISBN 0-8359-6358-6) there is a short section that suggests "Do-it-yourselfers might begin with #12 or #14 copper wire (about 2.5-3mm diameter).... made up into a coil of 20-30 turns some three to four inches (75-100mm) diameter, and check it out". The idea is shown in **Fig. 2**. Just that - no other information about the length of the element or what tapping point to achieve resonance. I'm sorry it's a little spartan but it's a start point for experiment.

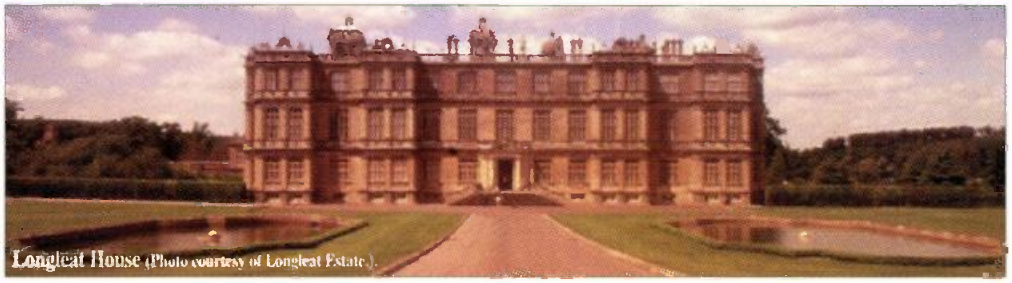
I did however, find a little more information in the excellent book *Joe Carr's Receiving Antenna Handbook* by **Joe Carr K4IVP**. In chapter 12 on 'Low frequency Antennas' Joe gives a pair of graphs that would seem to show that for a 2.45m long whip antenna a base loading coil of some 350μH or a centre loading coil of about 700μH should be used for the 1.8MHz band. Looking along the graph I see that for the 3.5MHz band about 130μH (base) and about 350μH centre loading coils should be used. The graph includes 7MHz and would indicate that about 25μH (base) and about 60μH (centre) coils should be used to resonate the same whip on the 7MHz band. That's a subject I'll keep looking into for you and I'll bring you my findings in a future issue of 'A-i-A'.

Sign-Off

So, I've come to the end of 'Tex Topics' once more, just time to sign-off and wish you good DX. I'd like to thank all of you who took the trouble to write in by E-mail, or conventional methods. Keep those questions and 'brickbats' coming in, that way we all learn something from the column. But most of all we want your ideas about antennas and related topics. So get your thinking caps on, or sketch out that antenna idea you've 'been using for years'. You never know it might get you a *More out Of Thin Air* (or an equivalent value voucher to spend in the *PW* Bookstore if you already have a copy. So get writing.

Tex

LONGLEAT - 40 Years & Counting!



Longleat House (Photo courtesy of Longleat Estate).

By Shaun O'Sullivan G8VPG and Ted Halliday G3JMY

Present Rally Manager Shaun O'Sullivan G8VPG and Founding Committee Member Ted Halliday G3JMY look back on 40 years of the ever popular Longleat Rally and provide an insight into the planning work 'behind the scenes'.

This year marks the 40th anniversary of the first Longleat Rally. And it's remarkable to think that many of the people who organise and attend this event - present Manager included - were not even born when it started!

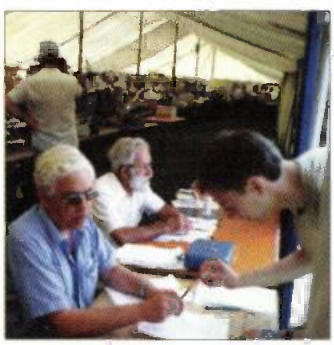
From modest beginnings Longleat has grown into one of the largest annual Amateur Radio events in the South of England. As a result, its date features in many people's diaries each year.

Bristol Group

The Longleat event has always been planned by the RSGB City of Bristol Group. However, Bristol is in fact some 48km from Longleat and so the connection between the two is not always made!

Back in the late 1950s, the event originally planned was termed a 'Mobile Rally'. Essentially, it was a pleasant summer's day outing for Radio Amateurs who used to operate '/Mobile' from their cars. In those days, this usually meant 'Top Band' (1.8MHz), operation.

Early photographs of the event



show the large antennas which are necessary for 1.8MHz mobile working. But over the years, mobile operation has moved almost entirely to v.h.f. and u.h.f., and it is now quite rare to see people arrive with mobile h.f. antennas.

Far right: Celebrating 25 years in 1982. The Marquis of Bath presenting a commemorative plaque to Founding Committe Member Harry Gratton G6GN.

The business side of the extremely busy 'Bring & Buy' marquee, showing helpers G3ECS and G4FMH during the 1989 Longleat Rally.

The size of the attendance at the early Longleat Rallies was not great, 50 or 60 to start with. Attendance during recent years always exceeds 5000...quite a change.

A shower of rain at one early Rally forced everyone to shelter in the only tent on site - the flysheet of **Ted G3JMY**'s frame tent! The Raffle table was in there too!

Splendid Antenna

We had a splendid antenna for our Top Band talk-in one year. It was a half-wave of aircraft dinghy antenna attached to a 4 foot diameter weather balloon.

When it was packing up time, **Vic G3CHW** swiftly unhitched the wire from the a.t.u. I was outside the tent at the time, about to reel in the wire. To my amazement, and the hilarious incredulity of the surrounding onlookers, it was snatched from my fingers by the balloon, which swiftly disappeared in the direction of Frome!

We used to run a 'Concourse D'Elegance' for those mobile operators with pride in their rigs. Vehicles of all types from bikes and motor scooters to Jaguars and Bentleys were presented.

Marks were awarded for originality, appearance, neat arrangement of gear (few, if any visible wires, etc.) ergonomics of controls and a few more which escape me. Some really impressive mobile rigs were entered. The proud winner received his prize in the late afternoon, when Raffle and other prizes were presented.

Travelling Furthest

There was, at first, a prize awarded for the amateur travelling the furthest to attend the Rally. It started quite modestly with the Midlands, then Scotland.

The 'travelling furthest' award seemed to peter out when it was seen that amateurs from say, Canada, etc., had clearly not travelled that far to attend the Rally. However, there has always been a recognition of the attendance of amateurs from distant places.

Some very enterprising amateurs turned up with unusual antenna systems. One in particular I remember was that of **Chris G3GYQ, (Harry G6GN's** son-in-law). It was a stacked omni cloverleaf for 144MHz based on a *QST* magazine design - very eye-catching.

Some of the loaded whips for 1.8MHz were auto-tuned, using motor driven, sliding contacts on the huge loading coils. There was evidence of painstaking work at a time when craftmanship was the driving force.

Other Attractions

There were 'other attractions' and games for the children to play and things for them to do at many of the rallies. There was an 'Electronic Maze' (a corkscrew of copper wire and a metal loop that had not to touch as it was guided along the corkscrew).

There was also a 'Treasure Hunt' - put a peg in the ground inside a marked out rectangle. The 'Balloon Race', with small hydrogen-filled balloons was always popular. One balloon landed in France, with a prize awarded to launcher and finder.

In the early Rallies, Raffle prizes were mainly donated by firms in the Bristol area. Lord Bath assisted at those relatively informal Rallies by presenting the prizes at the close of the Rally. It was all a very laid back affair in those days.

When the time came to cope with really big attendances, the Committee had to devise a more satisfactory method for distributing the tickets for the Raffle prizes, which by then had greatly increased in number and value. Some 10000 tickets were necessary.

Eventually, the present system was

Continued on page 32

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introduced. It involved every Committee member (**'Uncle Len' G4UZ** was Chairman) in many hours of fitting five unrelated tickets into each envelope. The 'winning numbers' had to be 'invented' after all the envelopes were sealed.

It was realised early on that a separate Raffle was required for the ladies. One such Raffle resulted in a lady winning a somewhat flimsy nether garment. When the ticket was drawn, the undaunted Vic offered to fit the garment! Decorum was satisfied by a polite refusal!

Heavens Gate

The top of the hill by the main entrance to Longleat (Heavens Gate) had been the site for many of the Rally Talk-in stations.

While on the topic of talk-in stations, I remember one year when I ran a 3.5MHz talk-in from my caravan. The antenna was a quarter-wave vertical in the shape of a 50 foot 'Telomast' with a 17ft whip (derived from an Army field antenna) on the top.

The antenna was, without doubt, a very satisfactory installation. The wire fence around the Hippo pen was used as an untuned ground plane!

Longleat's Lions

There was always plenty to interest everyone at the Longleat Rallies and I remember when the late Marquis of Bath first introduced the Lions, with the attendant 'white hunters'.

'Bicycle mobile' in the early days! A young visitor just arrived at one of the early rallies.

The Marquis of Bath was on the gate himself (taking the money!) when we went through. Then there were the Morris Dancers on the side lawn, near the lake. The House was the focus of a lot of attention (that was where the only toilets were located for one thing).

Among the competitions I remember was the 'Top Band Aerial Field Strength Competition'. This was devised and run by G3CHW.

The contesting station would radiate from Heaven's Gate, having been entered for the contest via the talk-in. Vic would be down on the site, with suitable equipment to measure the field strength of the signal.

When the winner was announced it resulted in a rush of amateurs to view the loaded vertical on the winner's vehicle. I did wonder on a few occasions how many watts of power had actually been generated to produce some of the amazingly strong signals!

Trade Show

The trade show at the original Rally was very small and was not intended to be the main attraction. As time progressed, the trade show has increased enormously in size and scope, and the event is now termed as an Amateur Radio Rally.

However, the original intention of providing a pleasant summer's day out for Radio Amateurs and their families has never been forgotten. Longleat is a wonderful venue for a family expedition, with its pioneering and now famous Safari Park - something which the Rally predates by several years.

It's notable how many people attend the Rally every year and take pride in recounting how they 'haven't missed it for 20 years or more'. Many of the local B&B establishments take repeat bookings years in advance, assisted by the fact that the event is held consistently on the last Sunday in June each year.

Camping & Carvanning

Another popular facet of the Rally is the camping and caravanning facilities, and it's fortunate that visitors are able to set up camp immediately adjacent to the Rally for the entire weekend. On Friday night, the makings of a small mobile village begins to assemble, and many a barbecue and party is held by old friends who meet on the campsite each year.

Like most (but by no means all) Rallies, Longleat is organised by a voluntary group of Radio Amateurs for the benefit of their fellows. The proceeds of the event help to finance the activities of the RSGB Bristol group, including their increasingly successful Contest Group.

However, much assistance is obtained from the many Clubs in and around the Bristol area, and some of the proceeds are distributed to these. Other Groups, such as Repeater and Beacon keepers, RAIBC and the St. John's Ambulance Brigade (who provide the first aid) have also received grants.

Planning The Event

The work of planning the event begins in the Autumn. Having confirmed dates and the format of the event with the present Lord Bath's Agent, the organising committee arrange contracts for the major items of equipment to be hired.

The hire items include marquees, mobile toilets, tables, chairs, public address system, crowd barriers, generator, etc. These represent the major cost of organising the Rally and need to be fixed before exhibition and admission fees are set.

The major income to cover the costs comes from exhibition fees paid by traders. But smaller amounts are also derived from visitors admission fees, commission from the Bring & Buy stand, on-site caterers, etc.

Running a large event is no small undertaking, with costs running well into five figures and hence the financial arrangements need to be carefully considered.

In January, a large mail shot is sent to the traders. We canvas about four times as many traders as usually attend. This work is undertaken by someone who will be well known to many visitors, the Bookings Manager **Gordon Lindsay G0KGL**, assisted very capably by XYL Maureen.

Prior to Gordon, yours truly (Shaun G8VPG) undertook this role for some years. And I was, in turn succeeded **Brian Goddard G4FRG**, who for 11 years was known as 'Mr Longleat'!

Arranging a large Rally is a demanding task, which requires considerable commitment of your personal time. The number of telephone calls received can easily exceed 20 a day, and despite all our pleas, these are not always at very sociable hours. The record for lateness is 11.30pm, and for earliness, 6.20am!

Computer Equipment

Many visitors to Rallies comment on the amount of computer equipment now being sold. And it's interesting to see how the development of computers has been mirrored by their use in managing the event.

In the early 1980s, an attempt was made to use the then popular simple Sinclair Spectrum computers. Despite using a large amount of the expensive little rolls of especially coated paper that the primitive Sinclair printers demanded, the task was beyond the machine.

In the late 80s, the task was successfully implemented on my Amstrad PCW machine. These worked well and save an enormous amount of manual addressing and writing of letters.

When Gordon took on the task of arranging bookings, the application was transferred to a PC. Fortunately, we are lucky to have a number of Computer Professionals amongst the committee members.

The 'computer professional approach' provides many of the features of a professional marketing system, with smartly produced letters and the ability to provide the committee with regular reports. Traders booking late can be sent reminders at intervals.

Although the Rally is arranged by volunteers who might be correctly described as Amateurs in some respects, we cannot afford to be anything but professional in our management of the event.

As far as computers at Rallies are concerned, their presence simply reflects a demand which is present. Many Radio Amateurs have enthusiastically embraced computers as an extension of their hobby and Radio oriented computing is a significant sector of the home computer market.

However, there are still many companies selling 'pure' Radio products. In the early days of the event, these dominated the trade show.

Government Surplus

The 1950s and 1960s were the era of the Government surplus equipment and many traders sold ex-MOD equipment for a fraction of its original cost. This formed the heart of most Amateurs stations.

These days, Government Surplus equipment is quite rare and its collection and restoration has become a specialist interest of the hobby. And while on the subject of restoration and, I should mention that for some years now, the Rally has been pleased to host an exhibition from the well known Journeaux Collection of historic radio equipment.

Throughout the 1960s the growth of s.s.b. produced a new range of equipment and techniques that was less suited to home construction and modification of Government surplus equipment. The original dominance of British and American manufacturers was replaced by the Japanese names that we are now all so familiar with. Alongside these, the large national dealers developed and these companies usually have the largest stands at most Rallies.

Bring & Buy

The largest stand at Longleat is always the Bring & Buy. One large marquee is devoted to this, and the sea of faces pressed up against the crowd barriers around it testify to its popularity.

For those volunteers that run the stand, it's a very high pressure task and many of them are so completely absorbed that they miss the Rally altogether! Large queues build up as soon as it opens, with all manner of equipment being booked in for sale.

The stand operates on a commission basis, with 10% being deducted from goods sold. Over recent years, about 400 items are sold from the stand, with a total value in the region of £12,000.

Although the Rally can be planned by a handful of people, a much larger number are needed over the weekend on which it's held. Saturday is preparation day.

During the previous four days, contractors will have erected the marquees and delivered the equipment. In one day, we will then have to set up the trader's tables, fence the site, erect signs and position the large number of outside traders. Besides the Radio Rally, we also now feature a Craft Fair, an attraction that has provided popularity with Radio Amateur's families.

Loyal Supporters

The RSGB City of Bristol RSGB Group are very fortunate that many of the Amateur Radio clubs in our area are loyal and enthusiastic supporters of the Rally. Without their help, it would be impossible to organise the event. In return for their help, a proportion of the proceeds from the Rally is donated to Clubs, in proportion to help received from them.

We have no doubt that everyone who has attended will have their own memories of that Rally of Rallies.....the Longleat Mobile Rally! So, if you have not yet been to Longleat, why not pay us a visit this year?

We look forward to seeing friends old and new at the 40th Longleat Amateur Radio Rally to be held on Sunday 29 June 1997. The show opens a 9.30am - so don't be late in case you miss some of the 40th anniversary fun!

PW

The late Marquis and Lady Bath presenting prizes at an early rally.

Kenwood's Test Bench

TRIO

Gordon King G4VFV takes a look at an interesting trio of Kenwood instruments which he thinks could provide an economical way of obtaining that luxury 'dream machine' - a Spectrum Analyser.

By Gordon King G4VFV

A fascinating aspect of our hobby is the display of signals and their harmonics over a particular frequency spectrum on the screen of a calibrated cathode-ray tube. The facility is of tremendous help in designing and working with radio communications equipment.

Of course, the ideal becomes possible with a suitable spectrum analyser. But instruments of this kind are generally beyond the reach of most of us because of their elevated price, often in the tens of thousands of pounds region.

Nevertheless, if you have a reasonable oscilloscope in the shack then it's possible to obtain quite commendable displays at a remarkably lower outlay merely by hooking it to **Kenwood's SAE 1001 Spectrum Analyser Adapter**. This will set you back less than £600 but will provide many happy and technically rewarding hours of interesting spectral investigation.

In addition to the adapter, I was also sent for review and application evaluation Kenwood's 20MHz dual-trace oscilloscope, the **CS-4125**. This partners (like a glove!) the SAE 1001, the connected pair having exceptional potential.

Kenwood's **FCE 1131 hand-held counter**, with a 5Hz to 1.3GHz capability, also arrived at the same time. Although this is not essential for the primary task, it does represent an attractive addition by allowing accurate calibration of the test set-up and frequency identification of the signals.

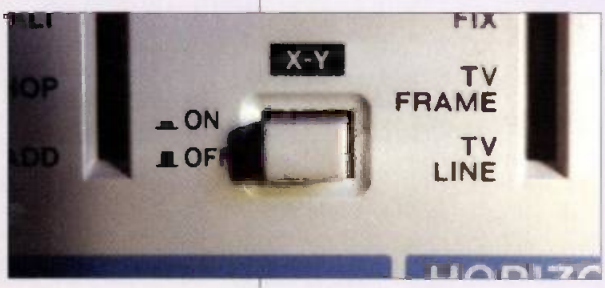

Fig. 2: The X-Y button of the CS-4125 oscilloscope which facilitates the SAE-1001 spectrum analyser adapter partnership.

Spectrum Analyser

A spectrum analyser is basically a radio receiver whose output, rather than driving a loudspeaker, causes the trace of an oscilloscope to deflect upwards (in the Y direction) by an amount dependent on the strength of the tuned signal.

Deflection is usually arranged to be logarithmic, rather than linear, to cater for as wide as possible dynamic range, typically 70dB or even more. The Y sensitivity often corresponds to 10dB per vertical division of the display's graticule, but on some instruments it can be more or less than the 10dB.

As the scanning spot of the oscilloscope moves from the left to the right linearly across the screen (in the X direction) so the 'receiving' frequency is caused to increase in synchronism. The horizontal sweep is calibrated in terms of frequency by horizontal divisions on the display's graticule.

So if there are (let's say) ten divisions and each one corresponds to 1MHz, then the sweep would rise linearly to 10MHz from its starting frequency. It would then return to commence the scan again.

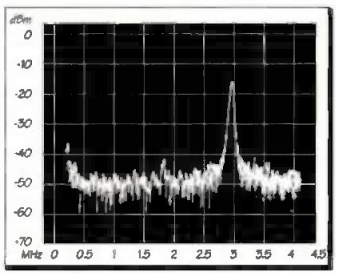

Fig. 1: Indicative example of the formation of a spectral display, showing a minor response of -45dBm at 1.75MHz, a major response of -17dBm at 3MHz and a 'noise floor' around -50dBm.

The formation of a spectral response can be gleaned from **Fig. 1**. Here the horizontal scale goes from zero to 4.5MHz, with 0.5MHz per division, while the vertical scale goes from 0dB (dB milliWatts) down to -70dBm, with 10dBm per division.

As the analyser filter is swept from zero frequency at the start upwards, the system 'noise floor' can be seen around -50dBm until the filter 'tunes' the main signal at 3MHz which causes the substantial response peaking around -17dBm.

A much smaller response around -45dBm can also be seen at 1.75MHz, rising just above the noise floor. (This isn't a display from the Kenwood pair, but purely an indicative example from my own spectrum analyser).

Analyser Adapter

The Kenwood SAE 1001 Analyser Adapter has a frequency sweep at least from 400kHz to 1GHz. It has a 10-turn centre frequency control with the frequency being indicated by a clear liquid crystal display (l.c.d.) in a 20 x 45mm window.

The adapter is switched on/off

from the mains supply by a press button. A similar button activates a calibration marker which yields a fundamental of 50MHz and a multiplicity of harmonics at 50MHz intervals virtually to the instrument's upper frequency.

Another knob provides adjustment of scan width from 10MHz (1MHz per division on the 'scope) to 1GHz (100MHz per division on the 'scope).

A third knob adjusts the scan rate from 0.5 milliseconds per division to 35 milliseconds per division. This is required so that the scan rate can be reduced to ensure that the response amplitude is not being impaired by the rate being too fast for the filter to track. (The swept filter has a -6dB bandwidth of nominally 250kHz).

A couple of front panel BNC sockets provide oscilloscope drive. They partner perfectly with a 'scope whose X and Y sensitivities are both 500mV per division, such as on the Kenwood CS-4125.

There's a third BNC socket which accepts the signal input across an impedance of 50Ω. The amplitude range is from 0dBm down to -70dBm, corresponding to 223mV down to 70µV potential difference (pd) across 50Ω. The adapter will accept a maximum of 10dBm (corresponding to 10mW or 707mV pd across 50Ω).

The amplitude response is logarithmic and with the Kenwood 'scope the vertical display corresponds to 10dB per graticule division. But, of course, a more magnified amplitude can be achieved merely by stepping up the Y input sensitivity.

The calibration marker at 50MHz corresponds to an output of 30dBm.

Mains powered, the input to the SAE 1001 via a three connector socket at the rear and it runs on either 230V or 115V mains (50/60Hz), which is adjustable internally. Power consumption is 10VA and Kenwood state that it's EMC compliant.

Dual-Trace Oscilloscope

The Kenwood CS-4125 as already briefly mentioned, is a dual-trace 'scope and makes an excellent partner for the spectrum analyser adapter. This partnership is significantly aided by the 'scope's X-Y facility, which is activated by the press of a front button, allowing direct connection to the adapter.

In X-Y mode the channel 1 input provides the Y or vertical defection, while the channel 2 input provides the X or horizontal deflection. For spectrum analysis, therefore, the X output of the adapter is connected to channel 2 and the Y output to channel 1, with the X-Y button depressed.

Vertical sensitivity on both channels in 'normal' mode is switchable from 1mV to 5V per graticule division by a pair of 12 position attenuator switches. Input impedance corresponds to 1MΩ across 22pF.

The 'scope's frequency response is up to 20MHz to the -3dB point from 5mV upwards and to 5MHz from 1 to 2mV attenuator positions. The low end goes down to d.c. or to 5/10Hz in the **AC** position of an associated channel switch, each one of which also has an **Input Earth** position, which can be handy.

Horizontal sensitivity is the same as the vertical sensitivity as also is the input impedance. But the bandwidth is only up to 0.5MHz and down to d.c. or 10MHz (-3dB).

The X-Y phase difference is no more than 3° up to 50kHz. This is an excellent parameter when it comes to the display of Lissajou figures and phase shift measurements.

A 20 position rotary switch gives sweep times from 0.5µs to 0.5s per graticule division. This works in conjunction with a **Fine** control.

The sweep can be arranged either to free run without an input signal or to trigger with a signal. There's the usual external trigger socket, of course.

Trigger source is selected by a five position switch. And a similar switch selects the **Trigger Mode**: **Auto**, **Normal**, **Fix**, TV field and TV line, the latter two useful for TV signal examination.

There are also controls for **Triggering Level** and **Slope**. **Beam Brightness** and **Focus** (but no 'astigmatism' adjustment on the front) and **Vertical** and **Horizontal** position. A connector at the front delivers a 1kHz square wave at an accurate amplitude of 1V peak-to-peak and is useful for calibration.

A **Vertical Mode** switch provides for **Channel 1**, **Channel 2**, **Alternate**, **Chop** and **Addition**. So, in some ways, the 'scope will perform as a dual beam instrument.

Three front panel BNC sockets accept Channel 1, Channel 2 and trigger inputs and a pair of similar sockets at the rear cater for Channel 1 output and Z axis (this allows the beam to be intensity modulated, including the possibility of TTL level intensity modulation).

The CS-4125 comes complete with a precision high impedance probe with a 'one' and 'ten times' switch. This is useful for signal chasing where lead capacitance could be important.

The cathode ray tube (c.r.t.) face measures around 80 x 100mm. And a calibrated graticule is provided with ten horizontal and eight vertical divisions (80 10mm squares) with sub-divisions and percentage lines.

The instrument is enclosed in a pale blue cover with a grey front panel. The carrying handle seconds as an adjustable bench stand.

Power consumption is about 30W. Dimensions are 300m width, 140mm height and 415mm depth overall. Weight is around 7kg.

Fig. 3: The CS-4125 and the SAE-1001 partnership in action in Gordon King's laboratory, the display showing a 50MHz signal at about -35dBm with sidebands either side at around -65dBm. The group of responses at the extreme right are local Band II f.m. signals! The left hand response represents the start at zero frequency.

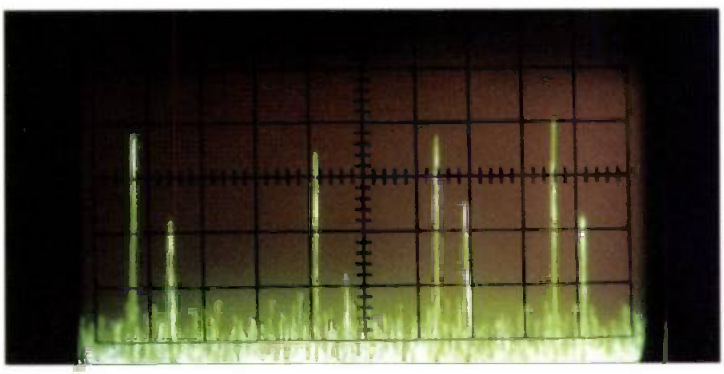

Fig. 4: With a short antenna connected to the adapter, the four local TV station signals were displayed with the vision carriers around -30 to -35dBm. The sound carriers are the lower amplitude responses to the right (6MHz away) of the vision carriers.

However, the harmonics vary in amplitude depending on their order.

Attractively Presented

The SAE 1001 is attractively presented in a dark grey enclosure and light grey front panel with an adjustable plastic stand. Dimensions are 360mm width, 88mm height and 235mm depth, excluding handle and feet.

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Remarkably Portable

The Kenwood FCE 1131 is a remarkably portable counter. It's not much bigger than a hand-held calculator and has excellent specifications.

Two inputs are provided: **Input A** has a measurement range from 5Hz to 25MHz across an impedance of 1MΩ/25pF and an input sensitivity of 15mV over 10Hz to 20MHz. And **Input B** which has a measurement range from 20MHz to 1.3GHz across 50Ω impedance and an input sensitivity of 10mV (r.m.s.) over 20 to 700MHz and 50mV to 1.3GHz.

The FCE 1131 has a large 11.5mm eight digit liquid crystal display (l.c.d.) and the electronics are based on the reciprocal counting technique, which is notable for high resolution. The timebase features a 10MHz crystal oscillator which has exceptional stability.

Measurement time is indicated on the l.c.d. and can be set for 100ms, 1s or 10s. It's normal for seven significant digits of result to be obtained per second.

To ensure that low frequency measurements are not affected by high frequency signals or spurious signals, the switching in of a low pass filter (50kHz cut-off) is achieved by depressing the time and hold button simultaneously. By pressing the hold button alone, the most recent reading can be 'frozen' on the display.

The FCE 1131 also allows the measurement of period over 5kHz to 25MHz with a resolution of 10 to 7ns (nanoseconds) to 1µs depending upon the measurement time and input frequency. Measurement time is selected by pressing a button labelled **Time** adjacent to the hold button.

The period mode is also activated by a press button and the input in this case is fed to socket A. Both sockets are of the BNC type.

Although the instrument can be switched on and off normally by a side slider switch, it can be brought into operation for about 15 seconds before automatically switching off again by pressing a frequency or period button. This is useful for battery conservation!

The l.c.d. also indicates the selected mode, and if the result calls for more than eight digits an 'overflow' arrow comes up on the display. There's also an indicator denoted 'Trig' which appears when a signal is detected and the counter is ready for measurement.

Power is provided by a 9V PP3 alkaline battery which goes into a small compartment at the rear of the instrument. Typical life span is 12 hours, but when the battery life falls to 10% remaining, the indication 'Bat' appears on the l.c.d.

The counter meets the requirements of the appropriate EMC (electromagnetic compatibility) directive. It's housed in a nicely styled plastic (ABS) case, which has a lift up bench stand at the back. Dimensions are 81mm width, 178mm length and 30mm depth. Weight is 190g excluding battery.

Potent And Low Cost

I found it remarkably easy to connect the 'scope and spectrum adapter together to yield a potent and low cost set up. The diagram in **Fig. 2** shows the X-Y button on the 'scope which facilitates the partnership.

The illustration in **Fig. 3** shows the two instruments connected up on the test bench with a 50MHz signal applied to the SAE-1001 and tuned to screen centre. I then introduced other signals to produce 'side frequencies', while the zero starting response can also be seen aligned to the far left vertical graticule line.

See Special Offer on page 39 of this issue to get your own 'test bench trio' at a really special price.

The little group of closely spaced responses on the extreme right of the screen represent the Band II f.m. radio signals from my local transmitter. I found that is was possible to resolve the subcarriers on some of the f.m. signals by zooming into just one or two of the signals. So that the subcarriers occupied the centre of the screen. I adjusted the scan width control towards maximum clockwise (e.g. minimum scan width).

The spectrogram in **Fig. 4** gives a good illustration of the four local TV channels (my local transmitter down here in Devon doesn't yet boast Channel 5, and this spectrogram provides it!), the taller of the responses are the vision signals and the shorter ones the sound signals at 6MHz spacing.

For the display in Fig. 4 I used a simple indoor antenna. But even so the strongest signal is at -30dBm (e.g. 1µW), which corresponds to a signal strength of around 7mV potential difference (p.d.) across 50Ω. The sound carriers average about -48dBm, corresponding to around 900µV.

The photograph, **Fig. 5**, shows the three instruments this time arranged on a test bench with a different test antenna, so the TV signals appear some 12dBm lower than those in Fig. 4. Here can also be seen the FCE-1131 counter in operation.

Incidentally, when the 'scope is used in its normal mode and an actual signal is applied to the Channel 1 input, the frequency of that signal can be measured accurately by connecting the counter to the Channel 1 output socket at the rear of the instrument.

The spectrogram in **Fig. 6**, shows the calibration signal. The first highest amplitude response is the 50MHz fundamental. This, when used for amplitude calibration, should be set on the 'scope to just reach the -30dBm graticule line (the illustration shows it having been set about 2dBm high).

The other three responses in **Fig. 6** correspond to harmonies. These, as I've already noted, continue virtually to the upper frequency limit of the adapter.

Laboratory Tests

I carried out a number of significant laboratory tests to the instruments. However, my main attention was focused on the group as a whole when connected and arranged in spectrum analysis mode.

Following this approach, I found that the 10db per graticule division logarithmic linearity of the vertical response was rather outstanding over the whole usable dynamic range especially for an instrument in this lower price range (especially when compared with a much more expensive dedicated analyser).

The test sample I obtained was accurate to within one graticule sub-division, corresponding to less than ±2dB error. The linearity did tend to diminish if the input was allowed to exceed the nominal input level specification, but it is possible for the adapter to handle some 10dBm (about 700mV pd across 50Ω) before it gets into trouble.

Horizontal accuracy was less good. But it's also of lesser importance because once the centre frequency has been established with the calibration signal or the zero frequency starting response (or both together for the best results) it's possible to read almost the precise frequency of a signal under examination by bringing the signal to the graticule's datum line by adjusting the centre frequency control knob.

The effects of the non-linearity along the X axis can be seen in the displays of Figs. 4 and 6. The vision and sound carriers in Fig. 4, for example, each have 6MHz spacing yet the spacing distance at the right of the sweep is less than that at the left.

Continued on page 38

Continued from page 36

In Fig. 6, each response is spaced by 50MHz, yet the sweep suffers some compression as it goes from left to right. However, this does not effect the accuracy of the frequency measurements at the datum line on the graticule as indicated on the l.c.d.

Fig. 5: The Kenwood trio set up in the lab for test, showing the counter reading 149.993MHz.

The non-linearity of display becomes more apparent on wide sweeps. This effect is a function of the non-linearity of 'scope sweep and of the analyser's oscillator sweep linearity.

It's possible to employ the adapter with almost any 'scope, even one without amplified X-Y facilities, by using the external trigger input (e.g. connecting this to the adapter's X output). I tried this arrangement with my own 'scope and found some improvement in X linearity, though the combination was less easy to set up than it was using the Kenwood instrument.

If you require to analyse signal sources which will not tolerate 'looking' into the adapter's 50Ω impedance, the coupling can be made to a standard 'scope probe. I found the probe which came with the CS-4125 ideal for this purpose, allowing coupling direct to high impedance circuits without adverse loading effects.

Important Applications

One of the most important applications of the Kenwood 'combination' in the Amateur Radio shack is being able to look at the harmonics being produced by your transmitter. And I found the best way of doing this was by the use of a small test antenna connected to the adapter's input.

'Looking' at your transmitter's output in this way facilitates establishing a 0dBm datum on the fundamental. It also helps identify spurious signals or harmonics to see by their response on the screen whether any radio, TV or commercial transmissions at near-by frequencies could be affected!

My Yaesu FT-480R 144MHz transceiver at 10W produced a second harmonic at -50dB, a third at -60dB and a fourth at -65dB with no detectable spurious signals. My Icom IC-740 running at 10W at 21MHz produced a second at a mere -25dB (I must be looking into this soon!), a third at -60dB and a fourth at -70dB. Again, there was no sign of spurious signals. And a DNT M40FM converted CB transceiver running at 4W on 29.6MHz gave only a second harmonic at -60dB.

It isn't generally possible to resolve normal sideband components unless they are adequately removed from the carrier because of the fixed filter bandwidth of 250kHz (-6dB points). Nevertheless, certain third order inter-modulation components can be displayed.

I was pleased with the adapter's sensitivity corresponding to about 70µV p.d. across 50Ω which, in some cases made it possible to check 'off air' transmissions from other nearby, powerful Amateur Stations to assess their harmonic or spurious signal production!

It would be possible to introduce a wideband pre-amplifier to enhance the instrument's sensitivity, but this would need to have a very low noise figure to improve the low level dynamic range. A more selective pre-amplifier would provide better results over a small part of the spectrum.

Significant Value

The set-up I reviewed also has significant value for the investigation of EMC problems. And although an instrument of this type cannot be expected to provide definitive information, it is certainly extremely helpful in determining the effectiveness (or otherwise!) of measures taken with the aim of minimising or resolving EMC problems.

For example, there are various ways (sadly, outside the scope of this present article) of ascertaining the magnitude of transmitter r.f. getting into the mains supply system. For this test a special 'coupling' is made to the power line allowing connection to the adapter.

Local signal fields can also be determined in the 'near field' with a special probe or magnetic pick up loop. Anyway, having possession of this sort of equipment in the shack will undoubtedly bring to mind a multiplicity of ways it can be used for a wide variety of tasks. This is not to say that professional use should be discounted! And I would certainly be very happy with the trio of instruments permanently in my lab!

The **Spectrum Analyser Adapter** has a price tag of **£581.63**, the **CS-4125 Oscilloscope, £351.33** and the **FCE 1131 Hand-Held Counter, £116.33**, all prices include VAT. The instruments are available from **Vann Draper Electronics Limited, Unit 5 Premier Works, Canal Street, South Wigston, Leicester LE18 2PL. Tel: 0116- 277 1400.**

My thanks go to **Tim Coates** of **Vann Draper Electronics Ltd.** for the loan of the items. It has provided a very interesting project and one which I am sure will be as much interest to our readers as it was to me!

See Special Offer on page 39 of this issue to get your own 'test bench trio' at a really special price.

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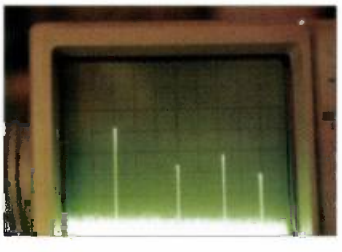

Fig. 6: This spectrogram shows the display of the SAE-1001 calibration signal where the response of approximately -30dBm amplitude is the 50MHz fundamental and the following responses some of the harmonics.

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FCE 1131 Hand-Held Frequency Counter - Only £110!

This portable counter with its large eight digit display has a range of 5Hz to 1.3GHz and a measurement time that can set for 100ms, 1s or 10s depending on the users requirements. It's housed in a plastic case with a fift-up stand for sitting on the workbench.

The FCE 1131 gets its power from one 9V PP3 alkaline battery giving a typical operating time of 12 hours. It measures 178 x 81 x 30mm and weighs 190g excluding battery.

The FCE 1131 normally retails for £116.33 inc. VAT, plus postage however if you take advantage of our offer you can get yours for £110 inc. VAT plus £5.58 postage.

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This dual trace 'scope makes an excellent partner for the SAE 1001 Analyser Adapter particularly due to its X-Y facility, which when activated by the press of a button allows direct connection to the adapter. The CS-4125 comes complete with a high impedance precison probe with a 'one' and 'ten times' switch and has a cathode ray tube measuring 80 x 100mm.

The overall unit weighs approx 7kg, measures 300 x 140 x 415mm. The power consumption is around 30W and the CS-4125 also has a carrying handle with 'doubles-up' as a bench stand.

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For a more in-depth description of this test bench trio see Gordon King G4VFV's review on **page 34** of this issue.

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Plane Speaking

John Worthington GW3COI looks back at his days in the Royal Air Force during the Second World War and the Morse traffic he handled.

By John Worthington GW3C01

As might well be imagined, 99% of the traffic passed on c.w. in the RAF during the Second World War was encrypted for obvious reasons. Yet the Morse course devoted at least 50% to plain language and many instructors would pull out their morning paper and send passages from it.

Our class soon realised that we were getting quicker on this material than we did on reading coded signals which consisted of mixed random figures and letters. The reasons were primarily that we could guess familiar words that lay ahead and as we could write in longhand that it was much easier than capital letters.

Naturally the RAF insisted on capitals for the code as a mistake of just one letter or figure was enough to render a message into gibberish. When the Morse course was finished, all who passed the final exam emerged as being perhaps 15% quicker at plain language and were posted hither and yonder to their various squadrons or whatever, ready to take on whatever c.w. was thrown at them.

Accuracy Paramount

There were many who subsequently never logged a single word of plain speaking and everybody settled down to a life of 'gobbledegook' where accuracy was paramount and anybody who made even scarce errors was given the 'chop'. Given the amount of QRM both via the antenna and between the 'cans' and your ears, the amount of concentration was so intense that it carried a man over into his off duty life so that it was quite common to see operators walking from the mess hall like the proverbial zombie.

Then one night at a station of Coastal Command, they had to deal with a civilian aircraft that had been diverted because of bad weather. This aircraft had on board a grizzled veteran who may well have known Morse himself and he was also wielding a bug key.

Now, bug keys were unheard of in UK forces until nearly the end of the war, but they came to be heard when the US joined the Allies. And at first we operators thought that the folk making those incredibly fast transmissions were doing so on ordinary 'pump' keys!

We all marvelled at their skill and envisualised their wrists blurred as they manipulated so expertly. They seemed to be the telegraphic equivalent of Benny Goodman and his clarinet and we nodded sagely and thought 'The Yanks would have a superman to send such brilliant stuff'!

Unfamiliar Language

Anyway, the civilian aircraft's threw the entire signals office into a right 'tizz' as first one and then another op tried to copy down the unfamiliar plain language that was coming at them at a speed of 35 words per minute. Eventually, four lads were scribbling away and between them, managed to get the gist of what Morse's contemporary was saying.

Apparently, the large flying boat (for such it was) had been unable to see the lights of the little dinghies denoting the safest landing stretch on the water due to the foul weather (it was a gale of wind and snow) and was urgently requiring something better as an indicator. The arrangements for this were made swiftly without fuss and the best operator of the watch passed the information as if "he was to the manner born."

Modesty dictates that his identity be not revealed, but later when the US operator visited the cabin to distribute a large carton of 'Camel' cigarettes to the lads, they all told him how they were now resolved to re-activate their plain language Morse reading skills! Meanwhile, I hadn't the heart to tell them I preferred a pipe!

PW

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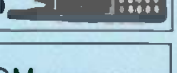

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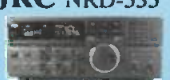

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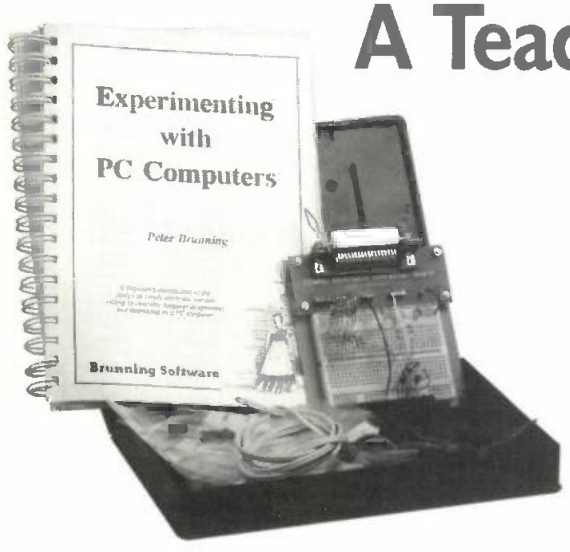

By Tex Swann G1TEX

Tex Swann G1TEX, along with being our Technical Projects Sub-Editor is a keen and dedicated computer user. Here he takes the opportunity of looking at an interesting new software teaching package which is full of teaching tricks!

Many eons ago (it feels as if it was when dinosaurs still ruled the earth) I started playing with computers. The first machine I played with for two hours a week, was a room-filling 'mini-computer' that probably had less power than the scientific calculator I now use. The programming language I used then was the 'high-level' (like English) language Algol-70, the forerunner of Pascal.

In modern terms, programming a computer is done in such esoteric languages such as 'C', 'C++', Pascal, Pascal+, Object Oriented Programming Languages (OOPS !), Visual Basic, (and Visual C and Pascal) and of course the new one for the 'world-wide-web' - Java (wasn't that west of Krakatoa before the big bang?). All of these tend to be huge languages, often needing a CDROM to hold all the program parts.

So, what place is there for a low level language that comes with its own in-built smart text editor and takes up just over a third of the space on a single 720k IBM PC disk? Not much you may say - but that would be a gross understatement of the power of Brunning Software's 'Brunword MCA' package.

Teaching Package

Peter Brunning has put together a whole teaching package based around a simple text editor and program 'compiler' for the 80x86 series of central processing units (c.p.u.) that's at the heart of almost every IBM PC or clone. The programming language is called 'Assembler', a language normally used when interfacing to hardware in the computer (see separate panel).

So, let's have a look at what you get in the whole package which consists of a 300 page ring-bound book called *Experimenting with PC Computers*, and a box of goodies with which to carry out the experiments.

Let me look at the book first, as it's available separately. In format the 300 page ring-bound book is well laid out in 16 chapters (containing 49 'experiments') and five appendices. There are many circuit diagrams scattered throughout the book.

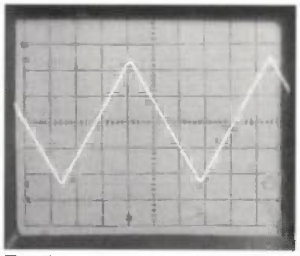

Fig. 2.

I've shown the ladder network in **Fig. 1**. And as you can see it's very clear in its layout. I've also included a photograph of a triangular wave in **Fig. 2**. (Each ramp is made up of 256 discrete levels).

The book chapters include 'Introduction And Software Installation', 'What is Computer Control?' followed by 49 experiments. These start from the simple flashing of an l.e.d., to creating your own on-screen oscilloscope for audio signals. It's at this point I must mention that the power of your PC limits the upper frequency of the 'scope.

The book covers more than just 49 experiments, it touches on items such as thermocouples and audio signals - producing and measuring them. It also has a section on Fourier analysis of a waveform - the why and wherefore of its usefulness.

To help you understand more about the c.p.u. at the heart of your PC, almost one third of the book is devoted to explaining how the 80x86 c.p.u. and MSDOS work together to become the computer that you're using. The various internal registers and 'flags' of the c.p.u. are laid out in simple terms making it readable for people of almost any level.

Over the years that I've worked on IBM PCs and clones as a support engineer I've built up a rather large library of MSDOS and assembler language books. Because of my experience I think that Peter Brunning has managed to distil, out of these weighty (and expensive) tomes, the essence of the system that is the IBM PC.

The Hardware

Now, after the 'paperware', let's turn to the hardware in the box. In the box are some 20 packets of individual components. There are passive components, resistors and capacitors, both simple and electrolytic.

Each value of resistor is in its own small resealable bag with the value written on the white label stripe, so making them easy to find.

Also in the box are various semiconductors. There are diodes (Zener and normal signal diodes), transistors (*npn* and *pnp*), and a 'hyperbright' l.e.d. There are also some short pre-stripped wire links

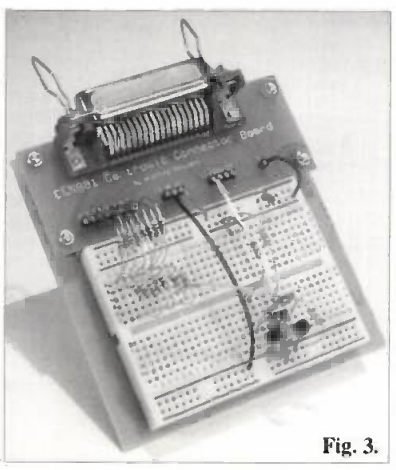

Fig. 3.

Fig. 2: A triangular ramp signal produced from the D/A converter circuit of Fig. 1.

Fig. 3: All the 49 experiments are built up on this well produced solderless breadboard system.

6. Using a Ladder Network

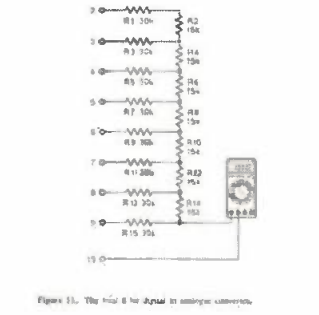

Fig. 1.

in a separate packet.

The wire links are to be used on the included, beautifully presented, 'patch panel'. The circuits are built up on a solderless connector block with two sections of 30x6 contacts as shown in **Fig. 3.** My only real quibble was that some of the links could have been just a little bit longer, making wiring up an slightly easier job.

Low Density Disk

Last but not least, in the box is the low density (720k) IBM PC formatted disk with the software on it. In these days of commercial software needing at least one CDROM, it comes as a bit of a shock to find a single disk hiding in the box. Even more of a shock was that the active program is apparently so tiny (I've seen word processor text files bigger!).

Tiny it may be though, the Brunword Assembler (BWA) is both fast and capable! You get a built-in text processor that has an assembly line checker incorporated. If the line cannot be assembled a sound 'trill' indicator alerts you to the error before it begins the next line.

When you've written (and saved) the assembler text to disk you can create the machine code program. A neat touch here is that BWA uses the same first part of the name that you use for the assembler text (giving the machine code program the '.COM' extension).

As you work your way through the thick book from front-to-back (and **you must do this** as many 'experiments' build on techniques and files used in preceding parts) the experiments become more and more complex.

Working your way through the whole package is certainly not a task that you'll finish in a short time. Even within the month that I had to 'play' with BWA package, I didn't complete the whole course. So be aware that this isn't the simple and easily completed package this appears at first sight to be - it's very comprehensive.

However, having said that it isn't quick to complete, overall the whole package left me with a rather pleasant glow of satisfaction after each experiment was completed. And though I write this review before 'the end' of the course so to speak, I have to say that the BWA experience is satisfying in a way I though I'd lost.

All Ages & Abilities

The overall package could be used by people of all ages and abilities. Although the speed with which the course is completed will vary with typing skills and knowledge.

As I mentioned earlier, even with a month to play with the package and some previous knowledge of assembler, I didn't complete all 49 experiments. So, it does mean I've got some enjoyment to come.

My thanks go to Brunning Software for the chance to regain control of my computer once again! *Experimenting with PC Computers* is available for **£24** and the associated kit for **£46** from the *PW* Book Store.

PW

Fig. 1: The well laid out diagram of a ladder network for producing a 256 step analogue signal from an 8-bit digital one.

ASSEMBLER LANGUAGE EXPLAINED

If you've not heard of the Assembler language (usually just called assembler) before, then it's going to seem to be almost incomprehensible. But keep on with it, it's actually easier and simpler than you think now!

Each microprocessor maker has their own idea what each command should be called. But as this particular software is to run on an IBM PC (or Clone) the assembler language used is Intel's own.

The 80x86 assembler language is full of such acronyms as 'mov', meaning move or copy, 'cli' - meaning clear interupt flag and 'inc' - meaning increment or add one to a number. These and many others are explained in the latter 100 pages of the 300 page book that accompanies the 'course'.

One thing tends to baffle most newcomers to low level programming is the method of counting used. In assembler you may use numbers ('0' to '9' in base-10 or decimal) or the rather strange looking Hexadecimal which has a base of 16. A hexadecimal number has a small 'h' added at the end to distinguish it.

COUNTING IN HEXADECIMAL

Counting in Hexadecimal (base 16, not base 10) is actually quite simple (although it may at first sight not seem to be). The hexadecimal numbers are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F (the character 'F' has a decimal value of 15). So stick at it and don't be put off!

You must not let this apparent backwards step discourage you. When using assembler language you have the **whole power of the c.p.u. at your command.** And if you think this is an idle boast - look at an old 16MHz clock speed 80286 machine running the GEM graphical system (predating Windows by several years) at a reasonable clip. We now have graphical systems that run subjectively very little faster on machines with 40-50 times the power and memory!

However, I digress, back to work now! Assembler language programs are turned into a numerical code that the c.p.u. understands perfectly. So, the computer can run flat out carrying out the series of commands at high speed.

Because you - the programmer - are 'talking' to the processor direct, the c.p.u. carries out the command **exactly and in the order in which you specify them.** And therefore you have to be far more painstaking to make sure that you do things in the correct order and in the right place. If you change a value in memory that shouldn't be changed then the whole systems may come crashing around your ears.

A comparable analogy occurs when you're building an amplifier and you are not allowed to use any integrated circuits or pre-wound inductors. The job will take a little longer, but you have a complete job that, when it's finished, you may be proud of, and your knowledge is that bit enhanced because of the process.

I've copied a section of one of the first programs here below and documented it to show you how easy it really is to write assembler **Fig. 4.** The items 'cx' and 'dx' are c.p.u. 16-bit internal memory (register) locations. The items 'ah' and 'al' are 8-bit parts (low part and high part) of the 16-bit 'ax' register.

SIMPLE PROGRAM

The very simple program shown in the panel turned out to be only 52 bytes long, and will continuously flash the l.e.d. coupled to the printer port until the "Escape' key is pressed, and then it drops back to the DOS command line. A similar program in either Pascal or C would be 40 or 50 times as big to do the same thing.

Without the 'dead' counting loops the l.e.d. would flash so fast that it would seem to be continuous (and may be many thousands of times per second depending on your computer). This speed of operation (because you are in control of what - and how the computer does things) may be used to great advantage by building your own computerised oscilloscope - that works!

Tex Swann G1TEX

```
; A program to flash a light emitting diode
;       Turned on when a value of '1' is sent out,
;       turned off when a value of '0' is sent out.
;
Label       Instruction         Comments
Led-on:     mov dx,378h         ; point register dx to the printer port
            mov al,1            ; copy the value 1 into al register
            out dx,al           ; output the value in al to the printer port
            mov cx,65535        ; copy a big number into cx register

Label-1:    push cx             ; save this value on the 'stack'
            mov cx,20           ; put another value into cx

Inner-1:    loop inner-1        ; count cx down to zero
            pop cx              ; get first value of cx
            loop label-1        ; take 1 away and jump to label1
                                ; counting from 20, 65535 times
                                ; now the programme can carry on

Led-off:    mov dx,378h         ; point to the printer port again
            mov al,0            ; this value turns off the l.e.d.
            out dx,al           ; when it is passed to the port
            mov cx,65535        ; start another count sequence
Label-2:    push cx             ; see above for the action
            mov cx,20

Inner-2:    loop inner-2
            pop cx
            loop label-2

Keyin:      mov ah,1            ; after one 'on' and one 'off' let's
            int 16h             ; see if the keyboard has been touched
            jz led-on           ; Not - Start again (to flash on)
            mov ah,0            ; Was it the 'Escape' key?
            int 16h             ; check the keyboard again
            cmp al,27           ; Was it the 'Escape' key?
            jnz led-on          ; Not - Start again (to flash on)

            int 20h             ; If you're here then Stop!
```

F.A.Q.

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After reading the review by Peter Hart last month, its little wonder we sold over twenty '756's in April! Fantastic display, 100W on all bands, HF+6M, dual receive etc. Read the review in RadCom or see our web site for G3GIQ's write up - he was so impressed he bought one himself! CTCSS encode as standard.

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Carrying on the Practical Way

By George Dobbs G3RJV

This month in his popular and widely read 'sermon on practical radio'....the Rev. George Dobbs G3RJV describes a 'wide range' variable crystal oscillator for the 3.5MHz band.

Over the years the amateur radio QRP literature has produced a mighty body of simple transmitters. The sort of thing that the beginner can use to put their first home generated signal on the air.

A surprising number of the seasoned constructors in amateur radio began by building a simple transmitter to give them a watt or two on the h.f. bands. It's the stuff of real Amateur Radio.

The usual limitation of these little transmitters has not been their power output so much as the fact that most of them are crystal controlled. It can be frustrating to be tied to a single frequency when the whole amateur radio world seems to be operating on every other frequency.

I suspect that many crystal controlled transmitters have been built but have seen little real use. Although in my own case I must say I've found crystal control very useful at times. It comes into its own when I have been monitoring a band from my workbench.

It can be quite interesting to listen on just one frequency and call anyone who 'passes by'. I have been surprised at what does turn up in the course of an evening on one point on a band

If I use a v.f.o. controlled rig the temptation is to hear stations on the edge of the passband. I tune to work them and before I know it, I'm tuning up and down the band working stations and never complete my work on the bench!

In The Beginning

In the beginning, most constructors start with a crystal controlled transmitter because of the problems of building a stable variable frequency oscillator. Those problems are probably overstated **but they can be difficult** for the beginner.

One solution is to use a variable frequency crystal oscillator (VXO). This is usually done by adding a variable capacitor, sometimes with a little added inductance, in series with the crystal.

The VXO circuit allows a small degree of movement in frequency. As our American friends say...it makes the transmitter 'frequency agile'.

Although VXO circuits **are useful**, there are also **some problems**. The main one being the limitation of frequency shift.

"Short and long term stability is one of the biggest challenges to the ham designer of VFOs"
Doug DeMaw W1FB: from *W1FB's Design Notebook*

The amount of shift depends upon the frequency of the crystal. Several kiloHertz of shift are possible with crystals of 10MHz or higher, but on 3.5MHz the maximum shift is typically 1 to 1.5kHz.

Any attempt to shift the crystal frequency too far will result in degraded stability. So a 3.5MHz VXO transmitter is only marginally better than a crystal controlled transmitter on the band.

Ceramic Resonators

Recently many constructors have been turning to ceramic resonators in place of quartz crystals. Although slightly less stable than a crystal in an h.f. oscillator circuit, they have two distinct advantages. They are also much cheaper!

A ceramic resonator from Maplin Electronics costs around 60p. They also have a lower Q which means they can be shifted over a great frequency range.

An added bonus is that there's a readily available ceramic resonator at a frequency of 3.580MHz - in the '80 metre' band's c.w. sector. Several circuits have appeared in recent times using this resonator for applications on '80'. My experience with them suggests that they are a good way to obtain a stable 'frequency agile' signal.

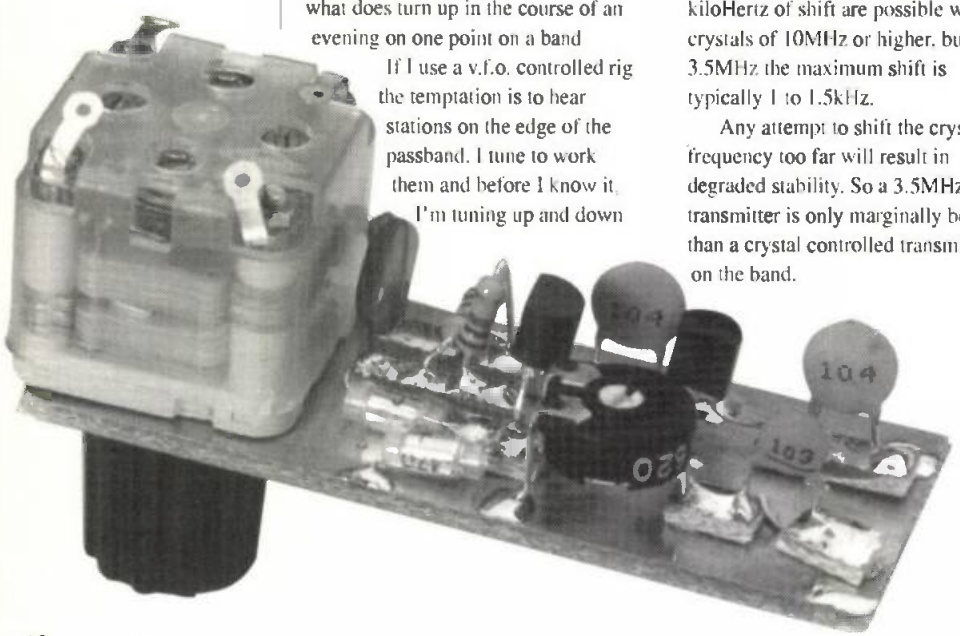
The diagram, **Fig. 1**, shows the circuit for a ceramic resonator VXO for 3.5MHz. The circuit follows ideas from **VK6SA**, **SM7UCZ** and others who have commonly used resonators in h.f. projects.

In the simple form illustrated, a 3.580MHz resonator will tune from 3.50 to 3.60MHz. This provides coverage of the whole c.w. sector of the 80 metre band.

The VXO is based on the well known, and well loved, Colpitts Oscillator with a variable capacitor in series with the resonator to provide the frequency shift. An inexpensive three terminal regulator chip produces a stable 8V supply for the oscillator.

I used a BC182 because I have a lot of them but any similar *PNP* transistor will serve the purpose. The output is taken form the emitter of Tr1.

I also included a preset potentiometer as the emitter load resistor to allow adjustable output from the oscillator. And on checking



This month's project - a useful variable frequency oscillator (VXO) employing a ceramic resonator.

the output on an oscilloscope I had in excess of 2V output from just below 3.5MHz to about 1.4V at just above 3.6MHz.

Stability Good

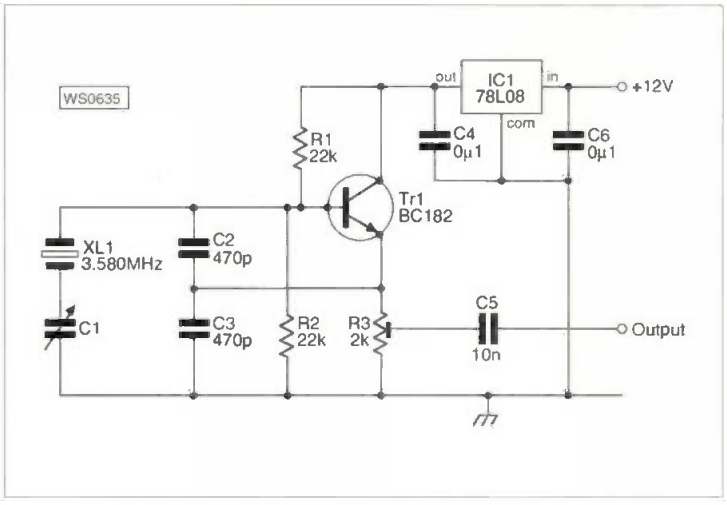
Short and long term stability were both good. The worse drift occurred at the very high end of the frequency range.

To obtain the amount of frequency shift required, C1 must be in the order of 150pF or more. I used a Polyvaricon variable capacitor culled from an a.m. transistor radio. Not the best component to use in a frequency determining circuit but the stability was better than I expected.

The oscillator could probably be used to drive a small transmitter or a direct conversion receiver, or perhaps even a superhet with a 455kHz intermediate frequency. I may press it into use for another project in this column.

With some of these ideas in mind I tried a little buffer circuit added to the VXO. This is shown in **Fig. 2**. I moved the output level control to the emitter of the buffer amplifier. For only a few extra parts this little circuit offers a very useful buffer stage for the VXO circuit.

So, here's another easy and cheap to build circuit to add to the armoury of the home constructor. Let me know what you use it for! **PW**



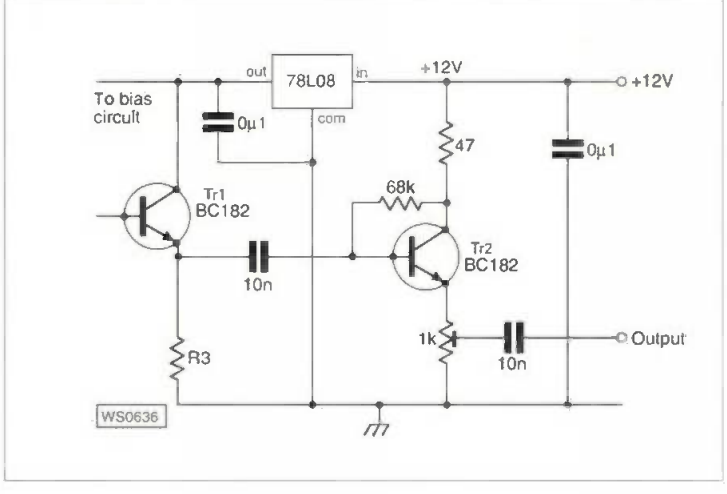


Fig. 2: George G3RJV added a simple buffer to the original circuit. He says that the few extra components prove their worth in this modification (see text).

Fig. 1: Circuit of the VXO controlled oscillator, employing a ceramic resonator - providing a much cheaper alternative to expensive quartz crystals (see text).

Join George G3RJV next month for more practical hints & tips.....

DON'T MISS IT!

Errors and Updates

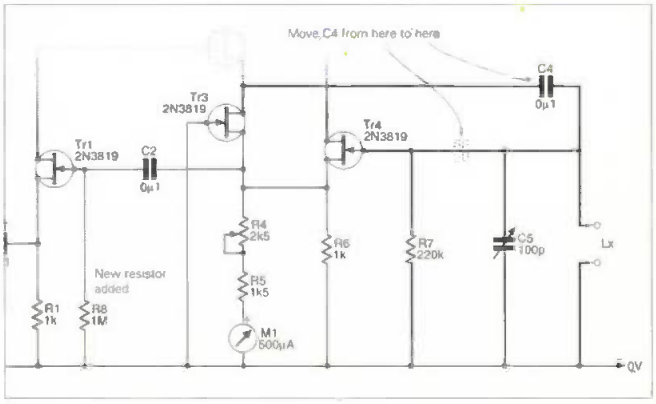
Carrying On The Practical Way (PW April 1997)

Two of the pins of IC2 in **George Dobbs G3RJV's** 'FF7' receiver were inadvertently misnumbered on the drawing of **Fig. 1**, on page 50 of the April 1997 issue of *PW*. The two audio inputs to IC2 should be on pins 2 and 3 (**not** pins 1 and 2), and the positive of fedback capacitor C16 should go to pin 1 of IC2 (**not** pin 3 as shown in the diagram).

Dip Meters - Dutch Style (PW May 1997)

In Wim de Ruyter's 'dip' oscillator article on page 51 of the May 1997 issue of *PW*, due to misinterpretation of the author's drawings, two errors were made. One component was shown in the wrong position and one resistor was left out of the circuit.

The missing component, a 1MΩ resistor (labelled R8), should be fitted between the gate of Tr1 and the 0V line and capacitor C4 should be moved. In the circuit diagram of **Fig. 1** on page 51 of the May 1997 issue, delete C4 from its present position and, insert it in the position shown.



Sterling Excellence!

The Icom IC-207H Dual-Band Mobile Transceiver

By Richard Newton G0RSN

Keen mobile operator Richard Newton G0RSN takes a look at a new mobile transceiver from the Icom 'team'.

The Icom IC-207H is an Amateur Radio dual-band mobile transceiver covering 144 to 146MHz and 430 to 440MHz. It's supplied with a d.c. power cord, mobile mounting bracket, spare fuse, instruction book and a rather impressive looking DTMF multi-functional fist microphone.

One of things I look for in a mobile transceiver these days is a detachable front. It's so difficult to fit even the smallest radios into modern cars.

The Icom IC-207H has the detachable front facility and is very easy to use. Sadly there is no facility to plug the microphone into the display head, it has to remain in the main body of the radio.

Most of the IC-207H's controls can be controlled from the microphone.

The obvious reason for detaching the head is to make it easier to mount the radio in the vehicle. To do this you have to purchase an optional extra, the extension cord.

The mounting bracket for the head seems to be a separate optional extra as well. If you have placed the main radio in the boot you will then need the optional extra that extends the microphone cord. In this case you will also have to purchase the speaker extension cable, (another optional extra) or you could make your own!

The plethora of optional extras that are needed in order to separate the head from the body of the IC-207H may seem excessive. However, if you give Icom the benefit of the doubt, you will consider, as I did, that it gives the customer the choice. You do not have to shell out on an expensive kit only to find you need one or two items from it for your particular situation.

The head when detached really is very small and neat. It can be easily placed in a shirt pocket or handbag. Even if you do not mount the IC-207H radio separately, the easily removed head is a wonderful security feature.

The detachable front facility of the IC-207H which G0RSN found to be very easy to use.

The microphone plugs into the main unit using the now familiar modular type plug. The microphone is very impressive. Most of the radio's controls, certainly all the ones I found I needed, could be controlled from the microphone.

The buttons are very well back lit. They are translucent and all controls can be seen, even at night.

Function Controls

The function controls on the main unit are well labelled and easy to operate. On the uncluttered rear panel you will find the standard power cable fly lead socket.

You will also find on the rear panel a speaker output and Data socket. This will support 1200 or 960bps Packet operation.

Icom seem to have departed from the 'norm' with the antenna socket. This is a chassis mounted SO239 type.

Unlike some dual-band radios, the IC-207H only allows you to operate one band at a time. (I'm used to operating dual-band radios that will monitor both bands at the same time).

I must confess I missed being able to monitor the local 144 and 430MHz repeaters on the way to and from work. The only way I could find to do this was to either programme both frequencies into memories and then scan. (The Icom IC-207H scans memories of both bands at the same time), or to use the 'Priority Watch' facility.

The Icom IC-207H has four power settings, Low (5W), Mid-Low (10W), Mid-High (20W) and High (50W on v.h.f. and 35W on u.h.f.). I liked this choice of settings.

Most mobile radios I have seen recently seem to have just three settings for transmit power, these are usually 5, 10 and then a massive jump to something like 50W. I have often wished for something in between the mid and high settings. Icom must have read my mind!

The Icom IC-207H has all the

facilities you would want to see on a modern radio. It supports DTMF transmission, and although it does not appear to support DTMF paging itself, it could be used to send DTMF tones to a radio equipped with DTMF paging.

The IC-207H has an amazing 150 memories, in addition to this it has a 'CALL' channel for each band. This is a dedicated memory that can be accessed at the touch of a single button.

The rig also has five 'scratch pad' memories. During v.f.o. operation, the transceiver automatically memorises operating frequency information, it will remember the last five frequencies you operated on! (That's impressive I don't think I could remember the last five frequencies I operated on!).

The IC-207H is very easy to operate, the memories are easy to programme and the radio can be configured with ease. There is no need to tinker with advanced settings if you don't want to, the radio will perform beautifully as soon as you turn it on. It's a radio you can enjoy straight away and even more as you learn about everything it can do for you.

Caught My Eye

There are a certain features on the IC-207H that really caught my eye. Icom have put a fully functional CTCSS encode and decode function on this radio. No optional extra here! Excellent move, and I hope others take note.

To compliment the fully functional CTCSS the IC-207H has an audio alert system that can be used in conjunction with CTCSS squelch. You can also get the IC-207H to scan for what CTCSS tone is being transmitted by another station.

Whenever I get the opportunity to look at a new radio I always seem to find a function that I call my favourite. The Icom IC-207H was no exception.

As an ardent mobile operator I find it annoying that mobile radios are supplied with fist microphones. I then have to spend time and money rigging up a hands-free set-up. Not so with the Icom IC-207H!

Icom have incorporated something that I have seen in commercial p.m.r. circles but never come across as a supplied option on amateur radio equipment. The excellent inclusion is that of a programmable locking push to talk (p.t.t.) function.

At the touch of just two buttons the microphone can be programmed to latch into transmit, it will stay there until you hit the p.t.t button again. Just hang the microphone up on the dash and you have instant hands free! I can't compliment Icom enough for this absolutely wonderful little addition.

On Air

So how did it fare on air? Well in actual fact it did extremely well.

The first station worked was **John G0TZW**. John was mobile and my able assistant, **Steve G1YNY** worked him through **GB3SC**.

John checked us on input having given us a very good report through the repeater on audio. John was even more complimentary on the audio when he heard our very strong signal on the input.

The next was a mobile-to-mobile simplex contact with **Gary G4UED** in Amesbury. From our location in Bournemouth this was a distance of some 64km. Again I received more compliments on the audio and enjoyed a very pleasant contact.

I also heard G8LVC giving the RSGB news broadcast who was an end stop signal from Chandlers Ford, something in the region of 40km away.

Finally I worked **Ian G8MLC** on the Northern side of the Isle of Wight. Using locators we worked out this was a distance of 48km.

Ian passed the following comments totally unsolicited at the very start of the contact. "Very good audio, excellent. Very clear and distinct". This was coupled with an extremely good report on the signal.

I had a very enjoyable chat with Ian, I used every transmit power setting. He gave me a good report even on the 5W setting and then dropped his power to 1W. The Icom still received him without hesitation.

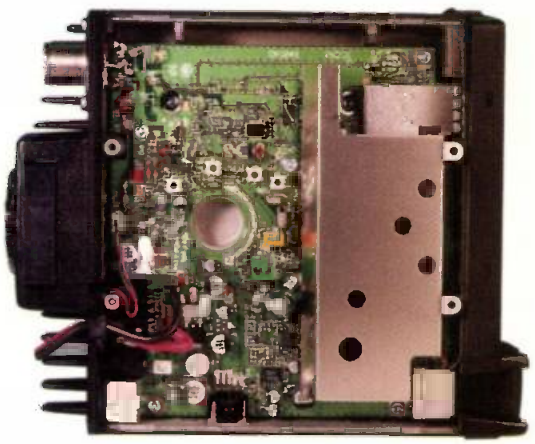
Excellent Impression

The over riding impression I got from this radio was one of excellence. Especially with the transmitted audio quality. **Everyone I spoke to on this radio** commented on the excellent audio quality.

I found it easy to use. It has some good features and I'm sure it would give sterling service.

My thanks go to **Dennis Goodwin G4SOT of Icom UK Ltd., Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 741741** for the loan of the IC-207H which retails for **£439** and is available from all Icom approved dealers.

PW



Manufacturer's Specifications

General

Mode	f.m.
Antenna Impedance	50Ω
Scanning Speed	16 Ch/sec (programmed scan)
	8 Ch/sec (memory scan)
Power supply	13.8V d.c. ±15%
Usable temperature range	-10°C to +60°C
Dimensions	140(w)x40(h)x184.5(d)mm
Weight	1.17kg

Transmitter

Modulation System	Variable reactance frequency modulation
Max. Frequency deviation	±5.0kHz
Spurious emissions	< than -60dB
Microphone impedance	600Ω
Output power current drain	50W (v.h.f.) 12A
	35W (u.h.f) 11A
	20W (v.h.f./u.h.f.) 6.5A
	10W (v.h.f./u.h.f.) 5.5A
	5W (v.h.f./u.h.f.)4.5A

Receiver

Receive system	Double conversion superheterodyne
Intermediate Frequencies	1st 46.05MHz, 2nd 450kHz
Sensitivity (for 12dB SINAD)	< 0.18µV
Squelch sensitivity	< 0.1µV at threshold
Selectivity	> 12kHz/@6dB
	< 30kHz/@60dB
Spurious response rejection ratio	> than 6dB
Audio output power	> 2W at 10% distortion with internal speaker
Current drain	Max rated audio 1A
	Standby 800mA

Chip In & Build.... Your Own Shack Desk

By Noel Orrin G3BBK

Noel Orrin G3BBK describes the construction of an attractively simple but pleasing shack desk. It only requires simple butt joints and Noel thinks the project is well within the 'average skill level'. So let's see that sawdust fly in your workshop!

You too can have a professional-looking shack desk if you follow the example set by G3BBK.

Every shack has some sort of working area for equipment and writing space. Most of us will usually start our amateur radio activities with little hardware, probably a 144MHz rig with power supply, an s.w.r./power meter and off you will go, using whatever comes to hand as a working area.

The 'whatever is to hand' approach is fine if you're the type who never collects more hardware. But invariably **you will!** And what happens when you can't expand sideways? - you'll start piling black boxes on top of each other! It's then that things begin to get out of hand, look ugly, and the working surface begins to develop a noticeable sag.

Opportunity To Design

I fell into the same trap of using any surface myself, so when we moved house some years ago, I took the opportunity to design something. It had to be simple to build, useful, look good to me and suit my needs.

The first thought was to just make something which would be strong and have a large enough area to accommodate everything on one level, in fact some sort of rectangular table. That's fine, but if you've got a fair amount of equipment (and probably also a computer) and accessories which you want to keep close to the radio gear, you've got to have long arms to reach everything without moving your chair.

Sitting at the centre of a semi-annular (ring shaped) desk, with a swivel chair at the centre would be theoretically ideal as this would maintain everything equally accessible. But to construct a desk to this format would not be an easy task for a d.i.y. enthusiast.

Following on my line of thought, it was obvious that a near enough ideal solution would be to make an 'L' shaped desk. This shape would be far more practical.

The design which follows is intended to be simple. It doesn't require more than the usual tools found at home (screwdriver, power jig-saw, hand plane, hammer and drill).

The dimensions given may of course be amended to meet your specific requirements. **However, I would caution you** against reducing the depth (front to back) of the desk, as you'll need to be able to position most equipment at the back and have a good clear working area in front of it for logbook, notes, computer keyboard, etc.

Functional Details

The functional details are shown in the heading photograph which shows my finished desk. It's complete with radio equipment on the left-hand side and computer items on the right. Note that there are no power sockets on the desk.

I considered that power points take up too much room, collect dust and are accessed rather infrequently. Therefore, in my version they're mounted as multiple strips of four outlets on narrow planking.

All the sockets were pre-wired prior to mounting the planking underneath the desktop at the rear. This has proved very satisfactory and I think this makes for a neater looking surface as all cables lay neatly over the back of the desk.

The desktop is actually constructed as two discrete items, i.e. the left-hand side (l.h.s.) and right-hand side (r.h.s.). They may be built in your workshop or garage and bolted together with two carriage bolts, on final assembly in the shack. This makes handling much easier, as when the desk is assembled the desk it's quite heavy.

The working surface may be finished to your choice. I decided to use plastic Vinyl sheeting in imitation gained leather appearance, as found in some car seating. This material is readily available from soft furnishing shops.

The front of the desk has generously rounded edges. This has three purposes: firstly it's much more comfortable to rest the arms on, secondly it obviates an otherwise sharp edge (which could lead to premature wear of the Vinyl) and finally, I think it looks better!

Construction Dimensions

The construction dimensions for the working surface, are shown in **Fig. 1**. All measurements are in millimetres unless otherwise stated. Naturally, you will vary the lengths to suit your own shack space, with the principle of construction remaining the same.

In essence, it's a 'table-top' mounted on a 'table-top', with cut-offs in the lower 'top' . This is to allow the desk to stand firmly on the three box like legs.

The upper and lower table-tops are cut from sheet chipboard. As I envisaged heavy loads, I used 19mm thick sheeting for both and the dimensions given assume that. You may change to 12mm chipboard if you wish to lighten the construction.

Four sheets are cut to identical size for tabling. Because they can be unwieldy to handle in a small working space and because it's important to have straight cuts, you may prefer to order all sheeting cut to size from your local timber merchant (as I did) and the extra cost is very small.

Designate two of the sheets as 'lower surfaces' and remove the areas shown, **Fig. 2**, in both of them. Mark out, and drill a starting hole where necessary and use your jig saw (or borrow or hire one!).

You may wonder why the cut out at the angled end is so far back from the 'front' at 235mm. The answer is simple - it's to allow plenty of knee room when swivelling about in a chair.

The two curved cut-outs (which are only done to one piece) are to provide access for tightening the two carriage bolts underneath. These hold the two halves of the desk together on final assembly.

Mounted Above

The desk top proper is mounted above its respective facsimile, but separated from it by a frame of ready planed 20 x 30mm timber. The 20mm sides being in contact

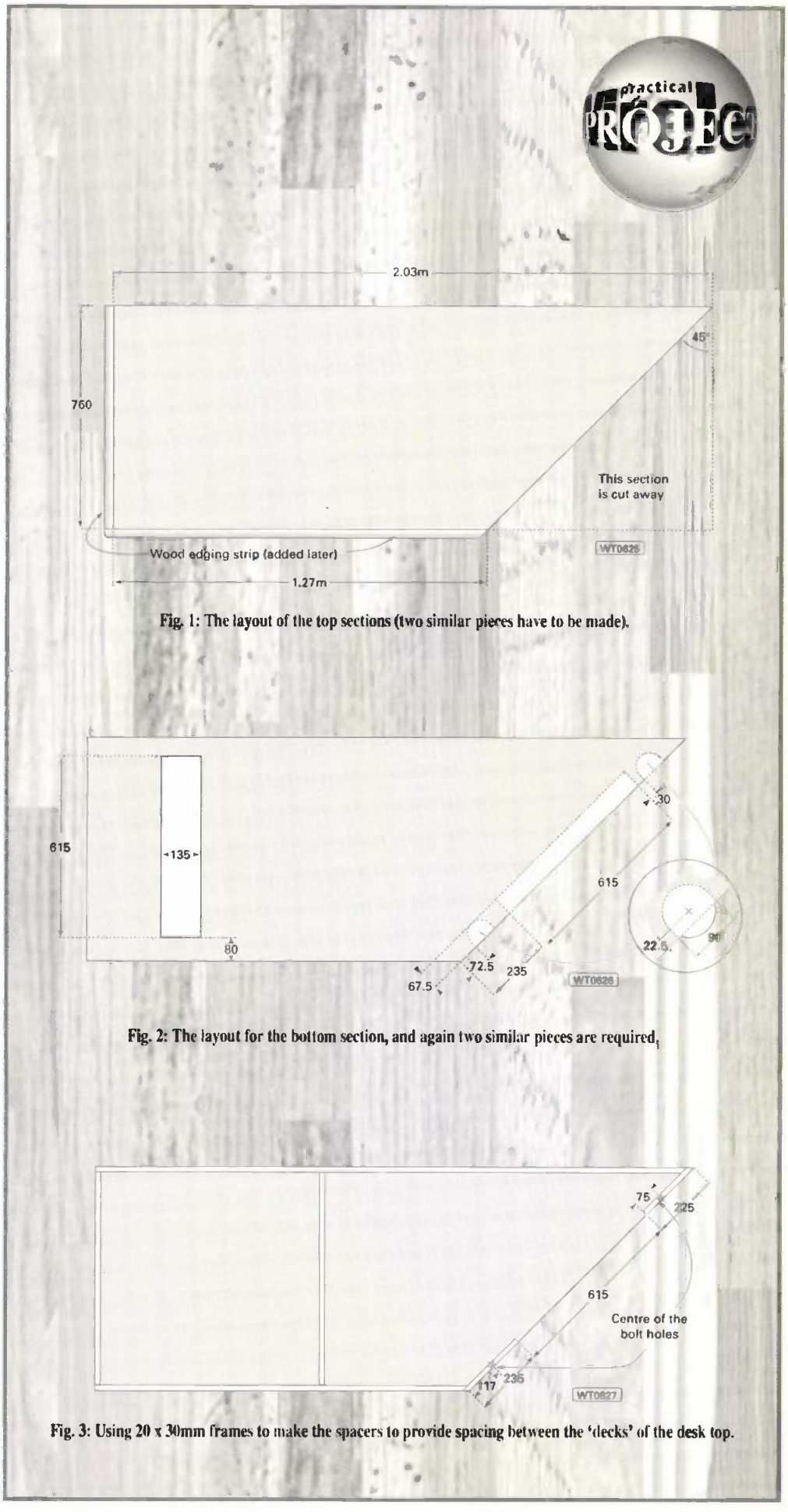


Fig. 1: The layout of the top sections (two similar pieces have to be made).

Fig. 2: The layout for the bottom section, and again two similar pieces are required.

Fig. 3: Using 20 x 30mm frames to make the spacers to provide spacing between the 'decks' of the desk top.

Continued on page 54

Continued from page 53

with the desktop. The diagram, **Fig. 3,** illustrates this, and including a reinforcing piece across the centre of the desk in each half.

Drill clearance holes through the chipboard for countersink screws, and countersink the chipboard appropriately. Before assembling drill clearance for 3/8in diameter x 2in carriage bolts.

Ensure that you drill both the l.h.s. and r.h.s. at the same time with them clamped together. This is to ensure you have no alignment problems when joining the two halves of the desk together.

Before screwing the top of the desk on, tap the carriage bolts into position. Their heads will self 'lock' into the framing and temporarily put their nuts on loosely, so they can't be accidentally knocked back and lost inside.

Put a screw about every 200mm. No 'fancy joints' are required at the corners, just 'butting' the joints is adequate as the main purpose of the framing is to give depth to the surface top for the 'legs'. (all joints, screw heads, etc., will eventually be covered over).

Note, that the rounded cut-outs **need only be made in the surface which will be on the lower side** where the nuts go and provide access for fitting and tightening the nuts to the carriage bolts on final assembly of the two halves. Using a jigsaw it's easy to cut roughly elliptical as this is easily done in one 'sweep' of the machine.

To complete the woodwork on the desk tops, (before bolting together) and using countersunk screws, you should fit a strip of wood (70 x 200mm if a 19mm desk surfaces is used) to the front sides of the desk, then planing them to a smooth curve at the top and bottom. **Note:** Screwing them in position first makes it easier to plane the wood, as they don't flex.

Box legs

Now for the box legs. These are three identical open ended boxes, made to be a loose fit in the rectangular holes in the lower desk surface. (The boxes are loose to allow for hole tolerances and also to allow for Formica type laminated covering, if you wish).

So, to start you need six pieces of 19mm chipboard, each 740mm high by 610mm wide for the broad faces of the boxes. These are screwed to the 19mm thick chipboard, which are 740mm high by 85mm wide. Again, space the screws about 200m apart and countersink (**Fig. 4** refers).

You now have to decide whether you will just paint the box legs or finish them in laminate as I did, using mahogany grained surface. If you decide to cover them with laminate, using contact adhesive, the legs should still fit easily into their desk holes.

Note that the desk just stands in the legs, no screwing is necessary. If your desk is on a level surface, you'll find it rock steady and there'll be no flexing even if you stand on it!

Working Surface

I recommend finishing the working surface with grained Vinyl, as mentioned earlier. Originally, I was going to stick it on with contact adhesive, but this can be tricky with a large area to handle, as it's not possible to slide the covering into position.

After a little thought, I opted for using a staple gun and with the help of a friend stretching the material, I stapled it on the underside of the desk top halves. **Note this is done before joining the halves together.**

Using small scissors and a sharp knife, it's easy to cut 'V' notches in the Vinyl at the rounded ends of the desk and fix with contact adhesive. **Make sure you overlap all end edges** as this way, as it makes for a professional looking finish.

Finally, to improve appearance, prevent things sliding off the ends of the desk and to cover up the wrapped over edges of Vinyl there's a little fine carpentry needed! Firstly you need two pieces of nicely grained wood, of 800 x 90 x 20mm dimensions. Then round off all edges, stain and polish to choice and fit to the ends of the desk with a couple of well countersunk screws.

The finished wood edging should be fitted so that there is a balanced overlap all round of approximately 10mm. This gives a modern look to the desk. Hide the screw heads with a bit of dowelling glued in and stain to match. (See **Fig. 5**).

All that now remains is to position the box legs in the shack, lower the desk halves into position and bolt together firmly, using large washers to spread the nut loading. Screw the planking strips holding your mains power sockets, referred to at the beginning of this article, to the lower rear faces of the desk. Now stand back and admire your handy work!

PW

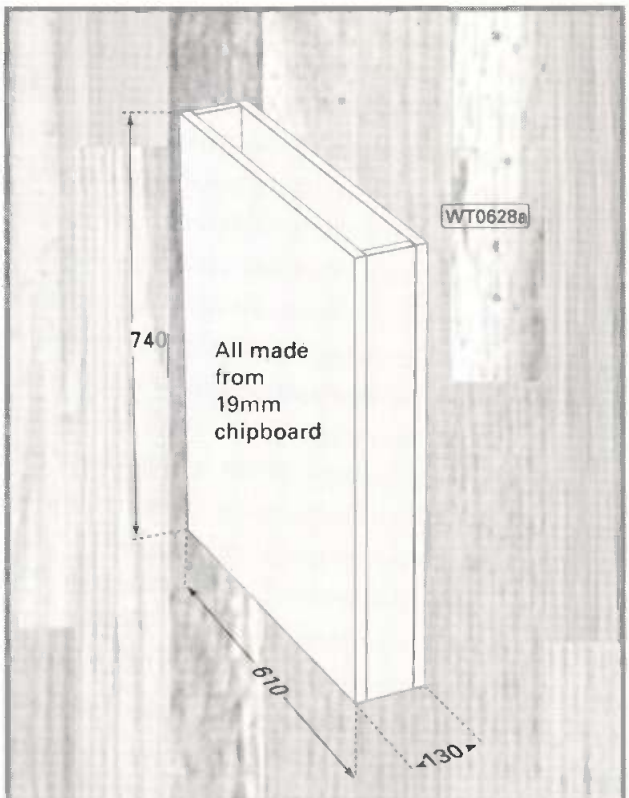


Fig. 4: The layout of the three support legs.

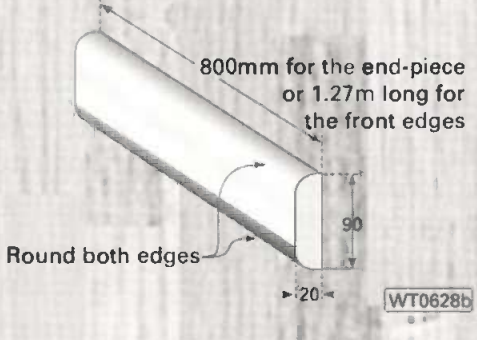
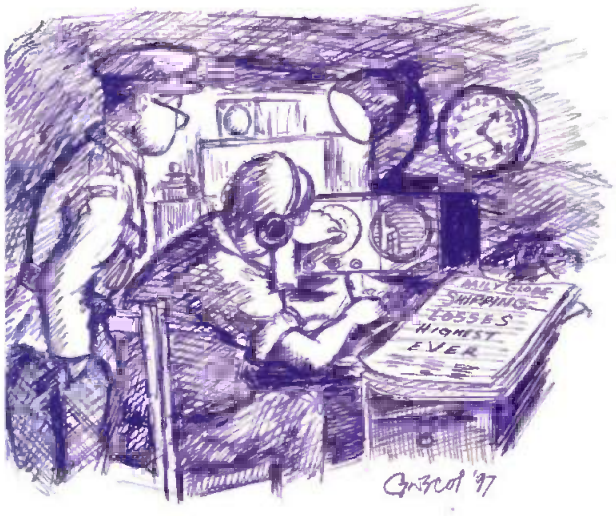


Fig. 5: Two rounded edges finish off the top surface.

On Secret Service....

With G6TW & 'Skyranger'



By Leon Platt

Leon Platt, who formerly held the callsign G3RPU pays tribute to his late friend G6TW's contribution to Second World War intelligence gathering in Britain's darkest hour.

As a result, a secret enemy base on Heligoland was bombed

This is a true account of the events experienced by my friend **Joe Noden G6TW**. He was one of the very first licensed Radio Amateurs in the early days of radio, and his secret activities considerably helped to reduce our shipping losses during the Second World War.

Sadly, my friend is no longer with us. Joe became a 'Silent Key' in the early 1960s.

Personally I have been a radio enthusiast for quite a number of years. But in the early days, I was just a short wave listener.

My friend's callsign 'George Six Tokyo Whisky' was much senior to me and a great inspiration. His knowledge of radio was unsurpassed and I would visit him at his radio shack when he was on the air, becoming almost hypnotised by what I saw and heard. I knew that one day I would be on the air myself!

However, to get back to the story. At the beginning of the War, the Government Radio Services Dept., operated then by the GPO, launched a blitz on all sources of communications equipment/apparatus, as deemed necessary by the War Department.

The GPO vans would come round and take away all the equipment they could find. They issued a receipt, labelled the equipment and took it into security stores for the duration.

It was later realised, however, that radio monitoring was essential to the Secret Service for vital information. So it was decided to establish specialised individual listening centres throughout the country.

Radio Amateurs would be ideal for the listening. Consequently, the longest established and trustworthy Amateurs were recruited and subject to clearance and signing of the Official Secrets Act, they were recruited into Service, for that particular function.

As a result, my friend Joe G6TW was recruited and allowed to keep his treasured 'Skyranger' receiver in situ. He was issued with a new spare set of valves and some replacement parts, for maintenance.

The procedure was that allocated short wave frequencies had to be monitored constantly, and everything heard taken down. Of course, this was in Morse code and made no sense, obviously, and was sent mainly in tiresome groups of letters and figures, which had to be de-coded.

Secret Service Captain

An Army Secret Service Captain was in charge, and would pay frequent visits. He'd inspect the radio station and take the written work away, for analysis and de-coding.

The listening hours were allocated throughout the area and my friend Joe's times were from 8pm until midnight, on certain days of the week. He had previously been experimenting with certain types of aerials, and this was in fact a good time to try them out.

One night at about 8.15pm, Joe was monitoring in the 7MHz band and heard a Morse transmission which sounded familiar to him. He had heard that particular preamble and key-style before on a previous night at the same time.

The following night the signal was there again, same frequency, same style. He was so impressed that he decided to inform the Army Captain in case there was some significance.

The Captain arrived one evening and heard the transmissions for himself. Instructions were given that Joe must keep on to this transmission each night and miss nothing and continue using his very effective antennas. A further visit was made and the transcripts sent immediately for decoding on a priority basis. The frequency was also made priority and all else ignored until further orders.

The other listening stations throughout the area were not receiving this signal, only with much noise, which made reception too poor. Therefore, all operators were instructed to construct antennas as a replica of the one Joe was using. The exact measurements, orientation, etc. were taken. Only one other station had any reasonable success.

One evening, about a week or so later, the signal disappeared from the air abruptly, and could not be detected again. Even Joe was not allowed to know what had happened until some time later.

Vital Information

The signal was coming from a secret hide-out somewhere in Heligoland and it was transmitting vital information about our shipping movements to Germany. At this time, our shipping losses were heavy.

The Secret Service had been very busy and had located the course of transmission by means of direction finding technology and other means. When the signal disappeared from the air, was due to the location being bombed by the RAF and completely destroyed.

It was indeed entirely due to my friend's Joe's perception, sensitivity and expertise in radio communication that this operation was very successful. As a result, at the end of the war he received from King George VI, a special commendation for his valuable service to his Country. A fitting tribute indeed for G6TW and his Hallicrafters 'Skyranger'. **PW**

BOOK P

Rob Mannion G3XFD looks at some interesting Amateur Radio books from the USA. And judging by what he says....Rob enjoyed reading them!

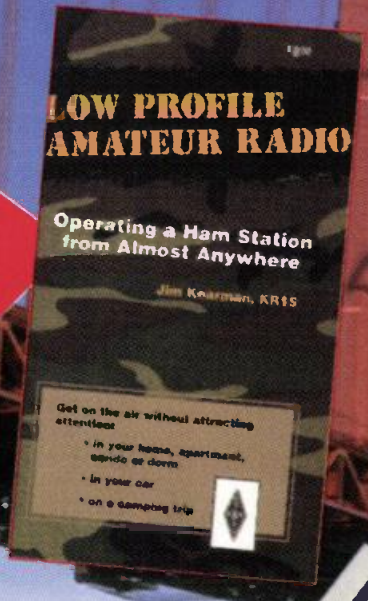
Low Profile Amateur Radio

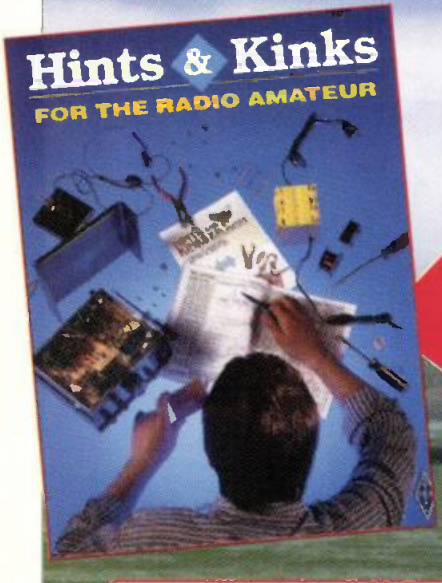
By Jim Kearman KR1S

Only the Americans could come up with a 'fun' book like this! And if you've got any memories from the 1950s and 1960s where Radio Amateurs (quite innocently and legally) transmitting from beaches or hilltops often attracted the attention of the police and were considered to be spies...you'll enjoy the concept.

And the concept of the book is the actual operation of an Amateur Radio station from almost anywhere - be it a hang glider (not allowed in the UK of course), camping, on holiday in an apartment. In other words...literally anywhere!

Chapters are provided covering interference and tackling the problem, techniques for low power voice, c.w., RTTY, AMTOR, packet and v.h.f./u.h.f. operation, and low visibility antennas for h.f. and v.h.f. you can build yourself. Altogether this is a fun book and even the cover is in low profile 'camouflage' style! **Highly Recommended** at just **£7.50!**





Hints & Kinks For The Radio Amateur

Edited by Robert Schetgen KU7G

This book will certainly appeal to *PW* readers. It's the 13th edition and is packed with ideas, circuits, suggestions, techniques and modifications. Most have been printed in *QST* and are being re-presented in book form.

In fact, the *Hints & Kinks* series of books are so good I've made a point of collecting them over the years. I don't have any of the pre Second World War editions but this one is already in my collection.

With sections covering tips and modifications to AEA, Ameritron, Collins, Drake, Heath, Icom, Kenwood, MFJ, Radio Shack, Yaesu and home-built equipment there's a lot to read. Other sections cover batteries, generators, mobile and portable equipment, construction, test gear and antennas, EMC (r.f.i. and e.m.i.) and a suppliers list. **Highly recommended.**

Hints & Kinks is available for **£9.50.**

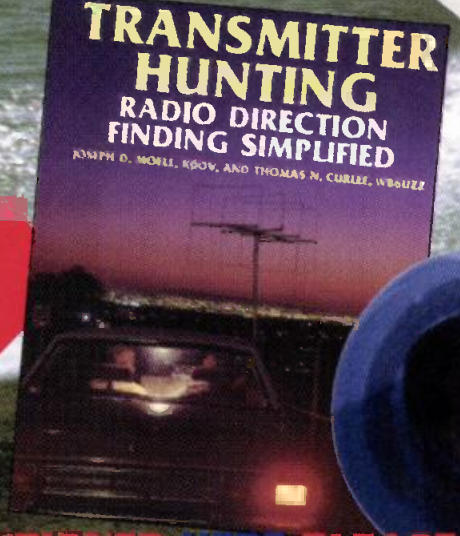
Transmitter Hunting - Radio Direction Finding Simplified

By Joseph Moell K0OV & Thomas Curlee WB6UZZ

Radio direction finding as an Amateur Radio 'sport' is certainly a minority interest here in the UK. However, I've always been interested in the subject and this book makes fascinating reading.

This book which provides excellent 'armchair reading' on the subject (along with being a very good textbook on the subject) taught me a very great deal on the subject. With sections covering history, theory, techniques, practical circuits and projects, it's an excellent book.

But I must say I was intrigued at the thought of night-time DF hunts as they seem to be popular in the USA! (I wonder how many 'DF Hunters' have been accidentally shot during night time 'hunts'!). **Highly recommended.** *Transmitter Hunting* costs **£20.95.**



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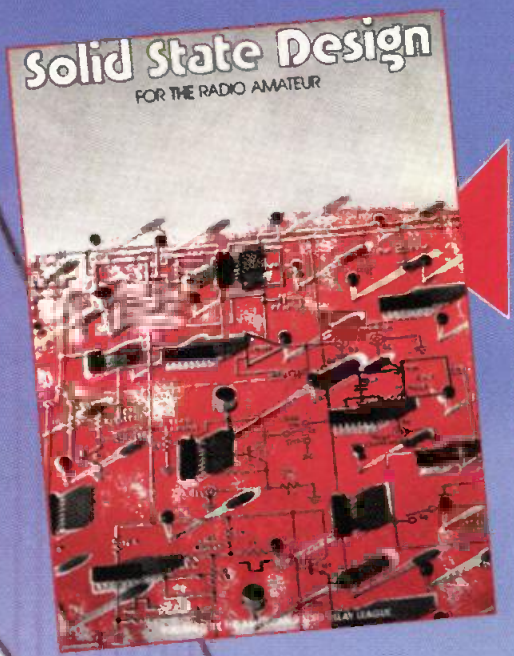


Solid State Design For The Radio Amateur

By Wes Hayward W7ZOI & Doug DeMaw W1FB

In my opinion this is a book that *PW* readers must have on their bookshelves. Bursting with circuits and ideas, it's really a manual for 'home-brewing' in disguise. And I've no doubt that if your a keen follower of **George Dobbs G3RJV**'s work - you'll already have a copy.

A list of the contents says it all: semiconductors and the amateur, basics of transmitter design, more transmitter topics, power amplifier and matching networks, receiver design basics, advanced receiver concepts, test equipment and accessories, test equipment and modulation methods. Particularly interesting for me is the section 'field operation, portable gear and integrated stations'.

A thoroughly good read, this is a book to inspire the amateur radio constructor, which will also teach a great deal and be a constant source of reference. My copy is very 'dog eared'! **Very Highly Recommended** and at just **£10.50** it should be easily affordable too!

All About Ham Radio

By Larry Helms AA6FW

Although very American in approach, this book could provide a helpful introduction to our hobby. Providing a good, light approach to Amateur Radio it's the sort of book which should be on school and general library shelves.

It also makes a very good 'first' text book and would certainly be useful for a science student. **Helpful and informative.** *All About Ham Radio* costs **£13.50.**

Shortwave Receivers Past & Present (1945-1996)

Second Edition

By Fred Osterman

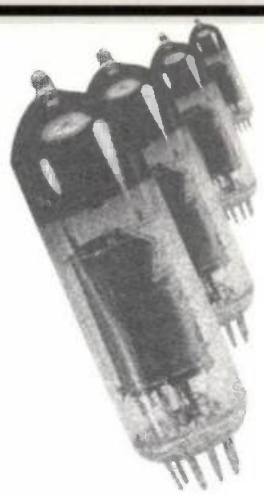
I had not seen this high quality (well prepared and excellent printed) book until asked to evaluate it on behalf of readers - and now that I've seen it, a copy will be joining my reference library. It will interest any listener or transmitting Radio Amateur.

Covering all the famous names (and quite a few I had not heard of before) each receiver dealt with has a photograph, technical details, rarity, dates of manufacturer and 'scarcity' comments recorded. Although *Shortwave Receivers Past & Present* is an American book it covers European receivers (including Eddystone, and KW who get a brief mention) and personally I found it very interesting.

I can see a lot of these books going back to the USA as *PW* readers travel to the Dayton HamVention - it would certainly help identify some of the more unusual receivers on sale in the 'flea market'! **Highly Recommended** at **£23.95.**

ER-FORM IN THIS ISSUE OR CALL MICHAEL HURST ON (01202) 659930.

Valve & Vintage



By Charles Miller

As you enter PW's 'vintage wireless shop' this month the historical 'air' is almost tangible. This is because our resident radio historian Charles Miller is taking his turn and continues telling the fascinating story of valve developments and John Scott-Taggart.

While John Scott-Taggart was building up his publishing business, which turned into a valve business, which turned into something quite different, other 'bright sparks' in the radio industry were, equally busy.

The other 'bright sparks' were engaged in trying to find the answer to the perennial problem of obtaining stable h.f. amplification with the triode valve. Actually, the answer was staring them in the face, all the while: you couldn't, but the poor dears kept on trying anyway!

The trouble with the triodes of those days of yore was that their inter-electrode capacities were quite large. So when constructors and designers tried to make them amplify at radio frequencies they were sufficient to set up imbalances in the tuned circuits that caused oscillations and all sorts of other nasty side effects.

When the designers finally latched on to the idea of internal capacities they came up with a brilliant idea - stick in real condensers externally. These would then balance out or neutralise those inside.

Now, as those of you who have been accompanying me on our regular little journeys down memory lane will know, very seldom was a significant advance in radio the work of one inventor alone. In actual fact, the usual pattern was that either one person developed (not to say, pirated) someone else's idea or that the said idea occurred to a number of people simultaneously.

In the circumstances the kudos and cash went to he who could leg it quicker than anyone else to the Patent Office, and neutralising capacitors ran true to form!

An American corporation obtained a cast-iron grip on the neutralising system. Any radio manufacturer wishing to take advantage of the improved h.f. amplification it provided had to pay a royalty.

Not even amateur constructors were exempted from the royalty. And when one of the British wireless magazines published an article on making neutralised h.f. stages there was trouble!

Fig. 1b.

Fig. 1a.

Fig. 1a & b: The arrival of the screened grid valve made a great difference to the performance of wireless sets in the 1920s. But the early version (Fig. 1a) was soon replaced by the more convenient 'single ended' S215 (Fig. 1b).

The said magazine was required in its next issue to print a stern warning that nobody was going to get away without coughing up a few bob! Happily, the British public in those days was a great deal less in awe than seems to be the case nowadays of what appears to it to be unfair interference in its private affairs.

It's very doubtful if any private individual was moved to hand over their hard-earned cash. However, it was a different story for the commercial firms who couldn't escape paying up. And doubtless, their aversion to shelling out fuelled the demand for a real alternative to the triode.

To The Rescue

To the rescue came **H. J. Round** of the **Marconi Company** who appears to have been one of the few really genuine and likeable innovators. His answer was the 'screen grid valve' in which a second grid was interposed between the usual grid and the anode.

The second grid literally acted as a screen between the control gird and the anode thereby sharply reducing the capacitance. By putting a positive voltage on the screen grid the electron stream passing through it to the anode was accelerated, the result being, improved sensitivity.

Round's screen grid valve appeared in 1926, and it's important to mention here that there had been previous valves with more than one grid. They dated right back to 1913 but these did not have the same properties.

The first attempt appears to have been the American scientist Langmuir's 'space charge' triode. Langmuir had discovered that around the hot filament of a valve was a cloud of negative electrons (the space charge) which provided the actual source of the current that flowed through the control grid to the anode.

Langmuir came up with the idea that the bigger the space charge, the greater the amount of anode voltage needed to draw anode current through the valve. So reducing the space charge would enable smaller anode voltages to be used.

What he did was to place a finely-meshed grid around the filament between it and the control grid. This

extra grid had around 10V positive applied to it with respect to filament, which in turn made it possible to run the anode too at a very low voltage.

Unfortunately though, apart from the saving in battery power, the space charge triode had no advantage over the ordinary variety as regards stability at h.f.

Next Contestant

The next contestant was **Schottky**, who in 1916 in Germany produced something that was much nearer the concept of the 'real McCoy' - a screen grid. Schottky fitted what he called a 'protective net' between grid and anode, to be supplied with a voltage just below that of the anode.

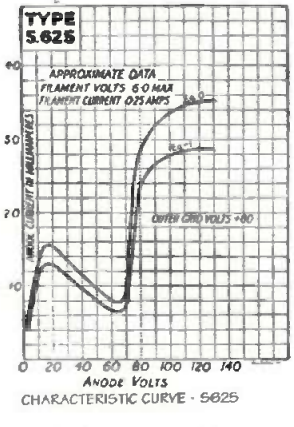
The Schottky valve also had a space charge grid between filament and control grid so it really qualifies to be called a pentode. (It's a pity Schottky didn't think of doing just that, as it would have spiked Philip's guns about 15 years later as we shall see in due course).

In fact, due to the protective grid not completely encircling the control grid, the internal capacitance was not reduced. As a result the valve, although more sensitive than a triode was still not suitable for h.f. amplification.

The Bi-Grid

Around 1920 H. J. Round introduced a variant of the space charge triode known as the Bi-grid. Essentially this valve had two control grids to just one anode.

The Bi-grid valve was a versatile device; each grid could be



CHARACTERISTIC CURVE - S625

Fig. 2: Manufacturer's valve characteristic curve for the original S625.

used to act as control grid. This made it handy as a self-oscillating mixer for early superhets, or the inner of the two grids could be run at a low positive voltage to make it act as a space charge triode.

In the latter role it was employed by such designers as Scott-Taggart in receivers that needed only one low tension (l.t.) battery for both filament and anode supplies.

Over the next few years there seems to have been genuine parallel, but independent development going on in England, by H. J. Round, and in America by **A. W. Hull** and **N. H. Williams**. What was to emerge eventually was the genuine 22-carat, 18-jewel screen grid valve.

The two Americans seem to have got there first by about a month. This occurred in April 1926 when **General Electric** (for whom they worked) announced a tetrode valve in which the auxiliary grid really did reduce the grid/anode capacitance.

Two alternative ways of making the screen grid were used. One used a series of tiny metal slats, with the other using conventional fine wire mesh.

The first type reduced the internal capacitance to around 0.006pF and enabled stage gains of 40 to be obtained at broadcast band frequencies. Oddly enough, G-E had at that time no plans to produce these valves commercially.

Rattling Pace

Back in England, Round must have been working at a rattling pace. Not only did he apply for a patent for his S625 screen grid (in May 1926) by the following year the valve was on general sale.

The S625 most certainly realised all the requirements for an h.f. amplifier. With a grid/anode capacitance of only 0.022pF it had a slope of 0.65mA/V and an amplification factor of 110.

As the type number indicated the valve had a 6V filament that drew 0.25A. It was double-ended with the filament and control grid connected to a 3-pin base at one end and the screen grid and anode to a 2-pin base at the other.

The original (expensive to make and expensive to employ) physical arrangement was dropped the following year. Instead a standard four pin base for filament, control grid and screen grid, and a top cap screw connector for the anode.

At the same, time the filament requirement was reduced to 2V at 0.15A. This new valve was called the S215 and very soon most of the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INSTRUMENTS BOUGHT

Fig. 3: Advertising for the new screened grid valve. The impact this development had on the industry was quite dramatic (see text).

other British manufacturers were making equivalents.

The vast increase in stage gain offered by the screen grid valves killed the neutralised triode stone dead, as far as commercial manufacture of radio sets was concerned. However, they did linger, on for a time in home constructed sets where cheapness as more important that outright performance.

By 1928 it was possible to buy a decent three-valve (screen grid h.f. detector and output) set, that had a performance far and away better than multi-valve sets of only a year or two earlier.

At this point an unexpected by-product of the screen grid valve was revealed. It also did away with the superhet, which up to then had been the only effective way to get reasonable sensitivity from a triode infested set.

Early Superhets

Early superhets used up to eight triodes and had separate tuning for the aerial and local oscillator stages and intermediate frequencies ("long wave amplifiers") working at around 50kHz. They were fiendishly difficult to handle, ruinously expensive on batteries and were all too likely to act as powerful transmitters of weird howls around the neighbourhood...to the misfortune of other listeners.

Only dyed-in-the-wool masochists of substantial means, could have wished to go on using 'dodgy' devices at r.f. frequencies once similar results could be obtained with half the number of valves.

As a result little more was heard of the superhet for about five years. Then the screen grid did an about face and made the new, improved superhet a practical proposition. So keep tuned and find out the details!

Beastly Charles?

Meanwhile, I am told that some people are saying that I was, rather beastly to John Scott-Taggart in my last little piece. Well, my shoulders are broad and anyone wishing to have a go at me is welcome to try their luck!

Oh, and by the way, after all that, advertising about ST valves being far and away better than anyone else's, there's a an interesting postscript to the story. It seems that they were actually made for him by Mullard. You can make what you like of that! So, cheerio until next time.

Cheerio from Charles, see you in October.

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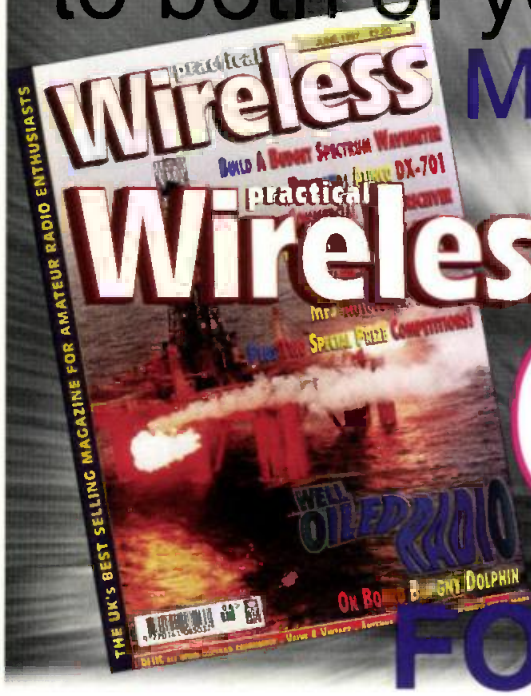

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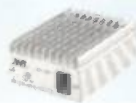

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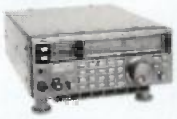

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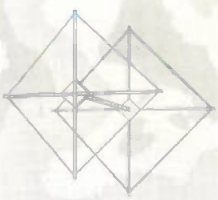

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ED TAYLOR NØED

SCENE USA

Ed Taylor N0ED tells us how the new US vanity callsign system works and also talks to a well-known British expatriate who is making his mark in American business.

I mentioned last year that Americans would soon be able to get callsigns they had chosen themselves. The scheme has now been put into operation, and I have joined thousands with my new call, N0ED. Here's an outline of how the system works.

There is a ranking system in US callsigns, in which more desirable ones (shorter) are obtained by passing examinations and getting a higher class of licence. 'Vanity' callsigns are being issued first to the most highly qualified, then moving down the hierarchy, with a 'Gate' for each grade. The next Gate does not open until applications from the previous one have reached a fairly low level. This avoids overloading the licensing authorities.

Eligible applicants can ask for a callsign corresponding to their licence class or a lower one. In fact, they supply a list of up to 25, and are issued the first available.

Most of the calls initially requested by US amateurs have been of the '1 by 2' variety, for example, W0QZ or N7DR. These are available to Extra class licensees, and all have been previously allocated. There is generally a two year wait after a call lapses.

Burst Of Applications

There was a mighty burst of applications on the day the scheme began. It took a while to process the 5000 requests that arrived in the first few weeks. The lucky ones, like me, who got their number one choice, went on the air straight away to show off their new personalised callsigns!

So, what is the cost, hundreds of dollars? No, just 30US$, for a licence valid for ten years. What a bargain!

As well as allowing amateurs to bring back some of the nice short callsigns that hadn't been heard for years (sometimes, more than 50), people chose initials, nicknames, and letters which 'sounded' good on their favourite mode.

An unexpected side-effect of the vanity system is some welcome new activity on the air. It's easy to ignore the rig in favour of something else when the h.f. bands are suffering from poor conditions. There has been a bit of an increase in US activity, perhaps because of interest generated by new callsigns.

Similiar Scheme

Could we have a similar scheme in the UK? I don't see why not.

The licensing authorities (I suspect) have no vested interest in amateur callsigns, as long as they can tell who owns a station, and where it is located. They might baulk at the extra paperwork, although the high cost of UK licences ought to pay for more than the current straightforward book-keeping exercise.

Let me make a few suggestions.

The UK licence is not really hierarchical, except the only amateurs who have access to everything on offer are full Class A licensees. Initially, vanity callsigns might only be available to them.

I expect that most applicants would want a '1 by 2' call, such as G0ED or M4AA. Outside England, a station would probably have to be content with a '2 by 2', such as GM0ED.

There are two 'pools' of callsigns available: those that have never been issued, and those that have been issued and lapsed. In the first category, a few ground rules would easily establish valid calls.

In the second category, perhaps an amateur should wait (say) ten years after a previously issued call has lapsed. It would be for the applicant to prove this, old callbooks might be used, since computerised records may not hold information going far enough back.

It could be desirable to limit the scheme to those who have held a licence for a certain length of time, say five years. In the initial rush, applications would probably just have to be dealt with at random.

New callsigns could easily be allocated by an organisation separate from the issuing and renewal body. Perhaps the RSGB could take on the task, for a one-time application fee reflecting costs.

For example each week they could send SSL (or whoever the contractor happened to be) a list of old and new callsigns, for example, G3SQX has become G0ED, and so on. The procedure then is almost identical to that in which a Class B upgrades to a Class A.

I think there would be a great deal of interest in such an idea. It does not seem as infeasible as it might a few years ago, given that '1 by 1' callsigns are now being issued for contests.

Dave Wilson President of Alpha/Power welcomes Ed Taylor N0ED to the company's offices and manufacturing facilities.

Dave shows off the Alpha 87A, the 'Rolls Royce' of linear amplifers.

Alpha Power

If you ask leading contesters and DXers which h.f. linear amplifier they use, some will say one of the Alpha range. If you ask them which amplifier they would **like**, most will sigh, and **wish** they could use an Alpha!

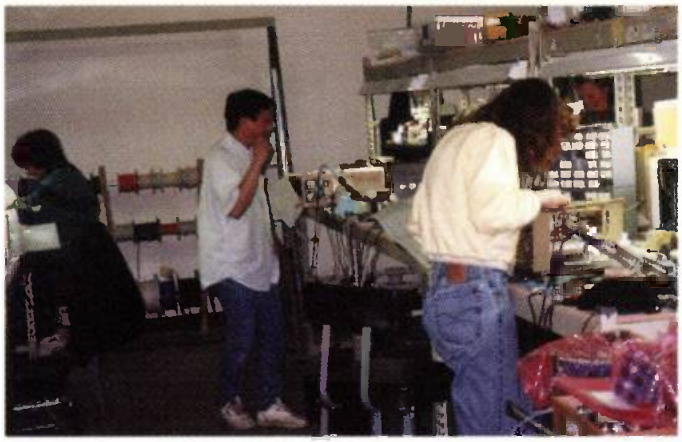
The company making these high-class amplifiers is American, but the person running it is British. **Dave Wilson** is well-known for his operating skills on both sides of the Atlantic, and for almost a year he has been applying other skills as President of **Alpha/Power, Inc.**

Dave used to operate as G3SZA, and was very successful on the lower bands, particularly 1.8MHz (160m). Now he lives in Longmont, Colorado, and is continuing to burn holes in the ionosphere as **AA0RS**. I talked to him about his radio interests, and his experience of business life making equipment for fellow amateurs.

Sunset Openings

Dave works long hours, but not necessarily nine to five. "I try to get home from work for the 'sunset opening' on 160m, still a big interest." He has taken advantage of the availability of land to set up big antennas.

"I use a Four Square: four towers



The production line at Alpha/Power.

each about 40m high, in a square formation. By using correct phasing, you get a beamwidth of 90° in any of four directions. It took three months of solid work, particularly laying the 400 radials, but is excellent, and performs like a 4-element Yagi."

Dave raised points which seem to be of concern to many amateurs licensed in the 60s and 70s. What is the future of our hobby, and what will attract new people?

Dave says: "I started by making crystal sets, which was a lot of fun. I get nostalgic about the early transistors, and keep some of them in my desk here! My mother made me go outside to work on circuits, on the coal shed roof!

"A twelve year old now has so many other things to do, as well as school work. Things that keep someone interested in radio have to be more exciting than computers and the Internet."

Dave continues, "Now people expect to operate computers and radios straight out of the box. They want to use them **now**!

"In my business this can be a real dilemma, many amateurs have had no experience whatsoever with high power. Any knowledge they have is purely theoretical, but I understand this: there are too many other activities in life. It seems that American amateurs are moving towards becoming 'Appliance Operators' even faster than the Brits!"

He adds, "Radio is dividing into those who are 'part-time' amateurs, and those for whom it's their life. The people who 'drive' the hobby may be leading, but the rest will not necessarily be willing to follow.

"Those at the forefront want the very high standards they have achieved themselves to apply to everyone else, which is not possible. What's more, DX and contest activity is really a spin-off. The real heart of amateur radio is a guy chatting to his friends, next door, next country, or next continent."

Challenging Opportunity

So, how did Dave become involved with Alpha/Power?

"In the middle of last year, I was talking to a couple of local hams. They knew I didn't like my current job, which was not fun or challenging, and suggested I talk to **Dick Ehrhorn W4ETO**.

"Dick created ETO/Alpha in 1970, and was planning to retire. A recent link with a larger company turned out not to be beneficial, because the amateur radio product line represented only a small part of their business, and received less attention than it needed."

Dave decided to try three months on trial and says: "I started working there with two objectives, to separate the amateur and commercial sides, and to fix the service backlog.

"We had 50 or 60 amplifiers waiting for repair, some going back a year or more. All the good technicians had migrated to the commercial stuff, which made business sense.

"The company's high reputation among radio amateurs was waning. Amateurs are not easy people to deal with, and I was getting several irate 'phone calls every day."

In a remarkably short time, Dave started to make progress. His years of working in manufacturing industry, and his home-brew experience were paying off.

Dave continues: "We are one of the few doing small quantity high-tech assembly in the USA. There are lots of problems, for example, it's difficult to find suppliers who will supply (say) 20 components a month, they want us to order hundreds.

"However, we have eliminated the backlog, which will be a first for us, the company has always had a waiting list. Amateurs don't want to wait."

So, what does Dave think of business life in the USA, compared to Britain? "I've noticed several differences, I'll mention a couple. It's harder to get a credit line for purchases from suppliers. They want cash before supplying components.

"And people tend to take more unscheduled days off. This makes it harder to predict when a job will be finished. Americans usually have fewer holidays than Europeans, and so perhaps need to compensate somehow."

High Energy

The calm exterior Dave Wilson shows the world disguises a high energy level. He continued our chat by describing to me his company's move to new manufacturing premises.

"It was a nightmare for several months. I was on the 'phone night and day, and my wife came in to help (she's still here!).

"I worked several 24 hour days, and couldn't have continued unless I knew it would calm down. Maybe I was the only one who thought that, but now I feel more on top of things."

Dave, What are the company's main products?

"We sell three amplifiers, all capable of 1500W continuous, the US limit, on nine h.f. bands. The '87A' is top of the line, with two 3CX800s in grounded grid. It is microprocessor controlled, and changes band automatically. An optional unit will also select the correct antenna."

This amplifier has a high price tag, but was described by **G3SJX** in *Radio Communication*'s review, as "remarkable" and the "Rolls Royce" of linear amplifiers.

Dave goes on to describe the less expensive options: "The '89' is a manually tuned version of the '87A', with much of the same circuitry. The '91B' has a similar specification, built in Bulgaria, which has become a centre of excellence for electronic products. This has been very successful, without compromising our main design goals."

All Dave's amplifiers are completely protected against user blunders. "The average guy only has to switch in the wrong antenna and some amplifiers go into meltdown! We reckon ours are the best you can buy.

"They sell steadily in the UK (through **Vine Antennas GW3YDX**). However, a lot of amplifier manufacturers serve a fairly small market.

"My interest is not just to do a babysitting job on the current line. We have several products under development."

Combined Developing

Alpha/Power is currently developing a combined 6 and 2m amplifier running 1500W. Dave says "Six metres could be excellent as sunspots creep up. We are also designing an amplifier for the commercial market.

"This will produce 3-5kW up to 30MHz, with automatic tuning. Small broadcast stations might find it useful, since it will just plug into a normal wall socket, no technical expertise needed."

Dave is also working on a totally new product range. "Lightning is a problem anywhere in the world, but some areas are particularly hazardous. Even a strike many miles away can destroy equipment.

"Our 'Strike Switch' senses an approaching storm, then disconnects lines, antennas and so on, grounding as necessary. Everything gets reconnected when the storm has passed.

"We think that both amateur and commercial applications exist. Its operation is dependent on testing for the amplitude of signals in the RF range. We will use the Alpha name, to pick-up any associated goodwill."

Barbara, Dave's XYL is the 'Power' behind Alpha.

Thanks for that Dave, it's great to see a British amateur making a success in a very competitive environment, and confounding the saying 'You can never make money selling to Radio Amateurs.' By the way, you can monitor the Alpha/Power company's progress on their web site at **www.alpha-power-inc.com**.

That's all for now. 73, and keep writing to me **Ed Taylor N0ED** at **PO Box 261304, Denver, Colorado 80226, USA**, or **E-mail** me at **EdTaylor@compuserve.com**. **The deadline for October is the middle of July.**

END

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SD-52	80/40/20/15/10m	2 Trap	105' long	£99.95 7.95
SD-54	80/40/20/15/10m	4 Trap	97' long	£154.95 7.95
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SD-162	160/80m	2 Trap	208' long	£119.95 7.95

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SPB-1 Pro-Balun is a 1:1 impedance ratio "voltage" balun that matches 50-75 ohm coax to 50-75 ohm load. 3 - 35MHz, 1.5kW. **Offer Price £27.95 p&p £4.95**

SPB-1-C Pro-Balun is a 1:1 impedance ratio "current type" balun that matches 50-75 ohm coax to 50-75 ohm load. 1.5 - 60MHz, 3kW. **Offer Price £29.95 p&p £4.95**

SPB-4 Pro-Balun is a 4:1 impedance ratio "voltage" balun that matches 50-75 ohm coax to 200-300 ohm load. 3 - 35MHz, 1.5kW. **Offer Price £29.95 p&p £4.95**

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These 600W deluxe traps are made of heavy duty components and housed in weatherproof sealed enclosures. No soldering or jumper wires are required.

Use 2 traps for a dipole, or 1 trap for a Vertical sloper.

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ST-20	14MHz trap	Offer Price £27.95 each p&p £4.95
ST-30	10MHz trap	Offer Price £28.95 each p&p £4.95
ST-40	7MHz trap	Offer Price £28.95 each p&p £4.95
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SVS-32	20/15/10m	2 Trap	13' long	£74.95 5.95
SVS-41	40/20/15/10m	1 Trap	28' long	£49.95 5.95
SVS-42	40/20/15/10m	2 Trap	24' long	£77.95 5.95
SVS-51	80/40/20/15/10m	1 Trap	53' long	£56.95 5.95
SVS-52	80/40/20/15/10m	2 Trap	49' long	£84.95 5.95
SVS-53	80/40/20/15/10m	3 Trap	42' long	£112.95 7.95
SVS-64	160/80/40/20/15/10m	4 Trap	77' long	£149.95 7.95
SVS-65	160/80/40/20/15/10m	5 Trap	73' long	£179.95 7.95
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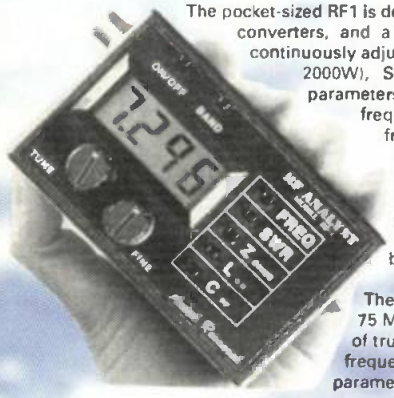
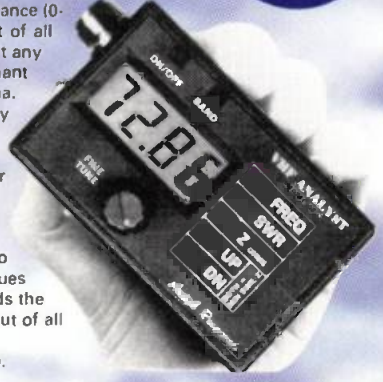


RF ANALYST™ RF1

The pocket-sized RF1 is designed to check and adjust antennas, feedlines, and RF networks. It includes a microprocessor, A/D converters, and a low-distortion, levelled, sine-wave generator, with 4 digit frequency readout, continuously adjustable from 1.2 to 35 MHz in 5 bands. It measures RF values of true impedance (0-2000W), SWR (1 to 15:1), C (0-9999pf) and L (<0.04 to 300mH). Its digital readout of all parameters is unique in its price range. It instantly reads out impedance and SWR at any frequency in its range. Antennas are easily trimmed after noting their resonant frequencies with its miniature 'transmitter', minimizing trips to the antenna. Feedline loss and phasing, Q, tuned-circuit resonance can be accurately measured and adjusted for best performance, even by inexperienced users. L and C are measured at the RF frequency of interest, not at 1kHz or 100 kHz as with other L/C meters. Basic accuracy is 2.5% to 5% over most of its range. The unit fits in the pocket, and runs on a standard 9v battery (or 7 - 15v).



RF ANALYST™ RF5

The RF5 has a 4 digit frequency readout, continuously adjustable from 35 to 75 MHz, and 138 to 500MHz (typically 530MHz) in 3 bands. It measures RF values of true impedance (0-600W), SWR (1 to 6:1), and its INSTANT SWR mode finds the frequency of minimum SWR (or Z) on command automatically. Its digital readout of all parameters is unique in its price range.

The unit fits in the pocket, and runs on a standard 9v battery (or 7 - 12v).

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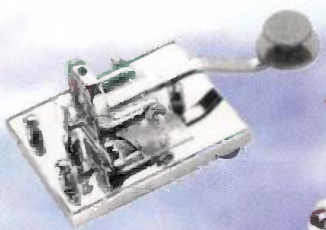

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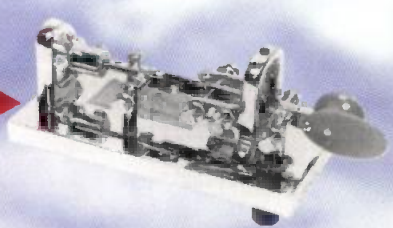

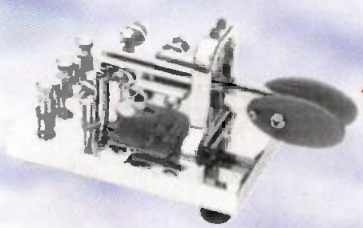

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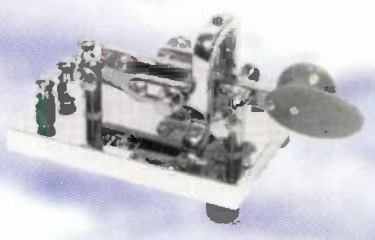

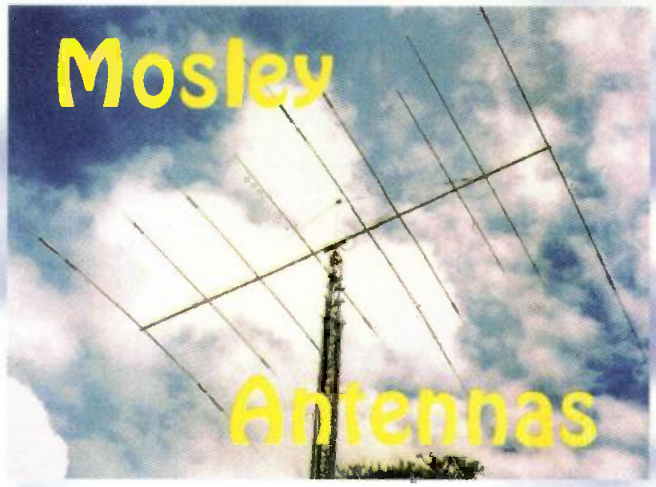

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TA34XL#	10/15/20M	4 EL	£649	£15
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DAVID BUTLER G4ASR

VHF REPORT

This month David Butler G4ASR reports on propagation openings, activity reports, 50MHz repeaters and proposals for a new digital sub-band.

Last time I mentioned that no Sporadic-E (Sp-E) openings had occurred on the 50MHz band during March. As luck would have it one sneaked in right at the end of the month, on March 31, just missing my copy deadline by one day!

At the QTH of **Ken Osborne G4IGO** (IO80) the opening to HA, OE, SP and YU commenced around 1545 continuing through to 1720UTC. The opening lasted a little longer at the QTH of G6YIN (IO93) with the station of I5MMC (JN53) being reported in at 1750UTC.

Although not authenticated, the station of W2DRZ claims to have heard "European sounding" stations between 1500-1600UTC. He reports that at his QTH in New York the 50MHz band was open to the W4 and W5 call areas at the same time.

As is often the case at that time of the year, around the equinox on March 21, Sp-E propagation sometimes goes 'hand-in-hand' with trans-equatorial propagation (see the December 1996 and January 1997 editions of 'VHF Report'). Although there was no extension this time to the UK the station of 9H1CG (JM75) - ideally situated in the Mediterranean - heard the V51VHF beacon (JG87) at 1740UTC over a path length of 6420km.

And so into April, but typically for this period there was relatively little happening in the way of DX propagation. No Sp-E openings of any real note were reported on the 50MHz band but there were three days when auroral events were evident on frequencies up to the 144MHz band.

A few minor meteor streams and the Lyrids meteor shower between April 22-24 produced some DX contacts on the lower v.h.f. bands. Some periods of enhanced tropospheric propagation was evident during the month but no extensive openings occurred.

Large Solar Eruption

On April 7 a large eruption on the Sun was detected by the Solar and Heliospheric Observatory (SOHO) spacecraft. Scientists said that the ejected matter was travelling through space as an interplanetary magnetic cloud and would strike a "glancing blow" to the magnetic field that shields the Earth more than 100km above its surface. They reported that although the coronal mass emission (c.m.e.) was a strong one for this low point of the 11-year solar cycle it was not as strong as events we can expect in three to four years time when solar activity peaks.

You may recall, however that many television, radio and newspaper commentators picked up on these reports and suggested that there might be damage to communication satellites, electrical power blackouts and auroral displays when the emitted material reached the earth three or four days later. This was all media hype.

In a Packet radio bulletin **John Branegan GM4IHJ** mentioned that a serious disturbance here on the Earth would only occur if the magnetic field polarity of the solar emission coupled with the magnetic field of the Earth. He argues that this latter point is very important and describes an analogy with two permanent magnets. If you bring them together with like poles facing one another (north to north or south facing south) the fields repel one another.

So, when in similar circumstances the polarity of the solar emission is the same as the magnetic polarity of the earth there is inward compression of the Earth's magnetic field. This could put some geostationary satellites into the full fury of the solar storm but there will be little or no penetration of the emission particles down through the Earth's magnetic field to the Earth's surface. Therefore there will be no big auroras and hence no monstrous currents generated in the ionosphere which could cause massive induced outages in domestic and industrial power distribution systems.

By contrast John mentions that if the solar emission magnetic field polarity is opposite to that of the Earth the result is very different. Magnetic coupling would take place and a gap opens in the outer parts of the Earth's magnetic shield. Into this gap the solar emission streams. But it cannot penetrate down to the equator as some unbroken earth field lines invariably prevent this.

However, it can migrate up between the field lines and down through their open ends onto the north and the south magnetic poles. It then causes enhanced polar zone h.f. propagation quickly followed by aurora and possible power outages.

Auroral Activity

On to Auroral activity now and following the c.m.e. on April 7 a gradual magnetic storm commenced at midday on April 10 and by the early hours of April 11 a severe storm was in progress with the arrival of the magnetic cloud. However, there was little coupling with the earth's magnetic field and no large aurora developed.

A small auroral opening was detected on the 50MHz band but no activity other than the GB3RMK and GB3LER beacons were reported. Later on April 11 the geomagnetic field had declined to unsettled levels as the cloud passed the earth.

Another weak event, (only affecting the 50MHz band) was reported on April 16. **Clive Davies G4FVP** (IO94) heard the GB3LER beacon (IP90) go auroral at 2200UTC, with signals peaking 52A. At the same time Swedish TV carriers (JP77) were heard with a T9 note indicating a form of propagation called auroral-E.

Unlike aurora where the c.w. note is very rough, auroral-E has a pure tone. It occurs fairly frequently (during an auroral opening) on the 50MHz band, particularly with stations located in Norway, Sweden or Finland.

On April 21 there was a good auroral opening which even managed to reach the 144MHz band. It lasted for about two hours from 1700-1900UTC and surprisingly there even was some activity!

The opening first began with reports of the beacons SK4MPI (JP90) and OY6VHF (IP62) sounding auroral. A few minutes later there was that wonderful rasping sound to be heard in the c.w. sub-band again.

The station of GM4ILS (IO87) was heard at my QTH (IO81) peaking 53A and working many European stations. Among the more active stations on the 144MHz band were LA0HB (JO28), LA3EU (JP32), LA4CQ (JP20), SM4AKW, SM4SCF and SM7ALC (JO65). There wasn't much activity on the 50MHz band although GW0GEI (IO73) did hear the beacon OH9SIX (KP36) some 2200km distant via auroral-E. The beacon was running 35W effective radiated power (e.r.p.) into a turnstile antenna and was booming in at RST 599.

Continued on pg.73

Repeater	QTH	Locator	MHz	CTCSS
GB3AE	Pembroke	IO71OQ	50.720	94.8
GB3AM	Amersham	IO91QP	50.840	77.0
GB3EF	Ipswich	JO02PB	50.720	110.9
GB3FX	Farnham	IO91OF	50.810	82.5
GB3HX	Huddersfield	IO93BP	50.800	82.5
GB3PD	Portsmouth	IO90KT	50.850	71.9
GB3PX	Barkway	IO92XA	50.780	77.0
GB3RR	Nottingham	IO93JA	50.820	71.9
GB3SX	Stoke	IO83WA	50.790	103.5
GB3WX	Shaftesbury	IO80VX	50.830	77.0
GB3UK	Bolton	ID83RO	awaiting authorisation	

Fig. 1: The new UK 50MHz f.m. repeaters.

Area	Tone (Hz)
A	67.1
B	71.9
C	77.0
D	82.5
E	88.5
F	94.8
G	103.5
H	110.9
J	118.8

Fig. 2: The nine CTCSS repeater tones being used in the UK.

Frequency	Usage
50.500	sub-band edge
50.510	Slow Scan Television
50.530	20kHz packet radio
50.550	Facsimile (fax)
50.570	20kHz packet radio
50.590	10kHz any digital mode
50.600	RTTY
50.610	10kHz any digital mode
50.630	20kHz packet radio
50.650	20kHz packet radio
50.670	20kHz packet radio
50.690	20kHz packet radio
50.700	sub band edge

Fig. 3: Proposed 50MHz digital sub-band.

Activity Reports

Emil Pocock W3EP will be active on the 50MHz band from locator GN05 and neighbouring locators during the period June 14-15. He will be using an Icom IC-706 and will also be able to monitor the 70MHz band for any possible cross-band activity.

The expedition group CY9AA activating St. Paul Island, Canada, will also have 70MHz cross-band capability. The group led by **Mike Smith VE9AA** will be active on the h.f. bands and the 50MHz band between June 26 to July 4.

You may recall that in the May issue I reported that **Andy Adams GW0KZG/MM** was going to attempt a moon-bounce (e.m.e.) contact with W5UN on the 144MHz band. Well I'm pleased to report that Andy did indeed complete his first e.m.e. schedule with the North American station.

The c.w. contact took 15 minutes with signals from W5UN peaking at S3. The location of the Royal Research Ship (RRS) *Charles Darwin* at the time was in the Arabian Gulf (LL75) approximately 100km north of Dubai.

The weather was marginal, wind force four with a moderate swell. Andy also heard SM5BSZ but he ran out of moon-time before the QSO could be completed. (Running out of moon-time normally means that the moon has gone down below the horizon.) On the following day he was active from LL86 but weather conditions with a 40 knot wind and a two metre sea swell prevented any further e.m.e. contacts being made although W5UN was heard again.

Andy reports that his next cruise will commence on June 30 setting sail from Southampton, via the Irish Sea, Hebrides, Shetland Islands to a working area west of Norway. There will be three main working areas in locators JP02, JP24 and JP47 with two intermediate port calls in Norway.

The cruise on the RRS *Charles Darwin* is scheduled to be completed by July 20. There is also a possibility of a two week cruise, west of the Shetlands, on completion of this cruise.

The station of GW0KZG/MM will be active on 144.240MHz on both s.s.b. and c.w. His meteor scatter frequency has yet to be decided and moonbounce operation, on 144.080MHz, will possibly take place around the e.m.e. activity weekend on July 5-6.

Andy's activities are however, subject to weather conditions and the granting of a high power permit. Operating times, subject to work loads, are normally 0400-0700, 1200-1300 and 1700 onwards. (All times are ship times).

Operation is also subject to non-interference with the on-board ship equipment. Andy reckons it may be a problem as they will be towing an undulating survey instrument. Previous operation on the h.f. bands had caused it to jump out of the water as the telemetry instructions were corrupted!

On the 144MHz band Andy will be using a Trio TR-9130 transceiver driving a Linear Amp UK amplifier (3CX800A7) producing 400W output. He is contemplating increasing the antenna system to 2 x 11-element F9FT Yagis with elevation control.

David Edwards G7RAU (IO90) mentions that activity on the 144MHz band so far this year has been very poor. By the end of April he had only worked 65 locator squares and 11 countries in a four month period. Hopefully, the 144MHz Sp-E season, which incidentally should now be underway, will have pushed this year's scores up somewhat.

Bill Bilcliffe G6NB informs me that after a period of some 16-years he has decided to stand down as Chairman of the **Aylesbury Vale Repeater Group**. The group is responsible for the upkeep and maintenance of the GB3AV, GB3VA and GB3BV repeater units. The new Chairman is Mike Marsden G8BQH who is QTHR. (For those that don't know what QTHR is ... it means the address is correct in the latest callbook.)

Microwave Bands

On April 7 a new world record was established on the 145GHz band. The station of **DB6NT/P** contacted DL6NCI/P over a 53km path, breaking the previous record which stood at 16km. Signal strengths were 10dB above noise level and this performance indicates that it is possible to reach more than 60km when conditions are favourable.

50MHz Repeaters

On April 7 the **RSGB Repeater Management Committee** made the announcement that the **Radiocommunications Agency** (RA) had given the all clear for Britain's first 50MHz repeaters. The list of repeaters is shown in the table, **Fig. 1** and it's expected that service for some will have already commenced during May.

Now that there are a number of 50MHz repeaters operational in the UK it will be useful for those who wish to make use of the facility to understand some of the 'finer details' of the specification for the repeaters and how this will affect access by users. The following information has been provided by **Iain Philipps G0RDI** for which I am most grateful.

The first item to note is that **the channel spacing specification is 10kHz** and that the maximum peak deviation of the repeater transmitter will be 2.4kHz. Those of you with receivers set up for 25kHz spacing will either need to replace the intermediate frequency (i.f.) filters with narrower ones or increase the audio frequency (a.f.) gain. In practice it means that you will need to turn up the volume control to a setting somewhat higher than normal on f.m.

More importantly, the repeater receivers have been designed to accept a maximum deviation of the input signal of 2.4kHz. It will therefore be necessary for you to adjust your transmitter deviation to suit or else your transmitted audio will be 'chopped' on speech peaks. Users will have to experiment to achieve the correct deviation, either by using appropriate test equipment or by on-air tests.

Continuous Tones

For the first time the access method for these 50MHz repeaters has been specified as a continuous tone-coded squelch system (CTCSS) only. The principle of CTCSS. is that a sub-audible tone (in the region 67.1 to 118.8Hz) is continuously transmitted in addition to the usual speech signal. Being below the normal band of voice frequencies it does not interfere with the received signal.

The objective of the system is to give some form of selectivity to the repeater user. Therefore someone who is located within the coverage area of two repeaters on the same frequency will only activate the repeater appropriate to the CTCSS. tone being transmitted. Currently their are nine CTCSS. tones being used in the UK and these are shown in **Fig. 2**.

The repeaters will identify which c.t.c.s.s. tone it requires by sending the appropriate letter in Morse code after the repeater call sign. If you don't have c.t.c.s.s. capability, at the appropriate frequency for your local repeater, then you will not open the repeater receiver squelch and will be unable to use the unit.

Digital Sub-Band

As part of the ongoing review of the various v.h.f. band plans, the **RSGB Data Communications Committee** (DCC) has together with the RSGB **VHF Committee** agreed to allocate a digital sub-band in the segment 50.500 - 50.700MHz. The table, **Fig. 3** shows how the DCC propose to allocate the frequencies within that sub-band.

Obviously the details are subject to input from existing users of the sub-band and as part of a consultative phase the DCC are now actively soliciting input from those users. There are a number of important points to note however.

Firstly, there is not currently an agreed IARU Region 1 Band plan in respect of digital operations within the 50.000-52.000MHz band. Any plan implemented within the UK will therefore be subject to change if and when such a plan exists and is agreed. This is not expected to be before 1999.

Secondly, the re-planning of the frequencies currently allocated to digital (i.e. Packet) modes has been necessary due to difficulties that have been experienced during negotiations to create and implement a network of voice repeaters in the UK. The direct result of this is that two channels (50.710 and 50.730MHz) are now within the segment allocated (and agreed with IARU) for voice repeater outputs.

The DCC proposal is that stations currently using 50.710 would move to 50.510MHz while those using 50.730 would move to 50.570MHz. It may of course be appropriate for any affected stations (at their option) to move to one of the other 20kHz channels.

As mentioned earlier the RSGB Repeater Management Committee (RMC) have announced that a number of f.m. repeater units have been authorised. While the RMC were careful not to allocate either 50.710 or 50.730MHz at this stage it is possible that repeater users may suffer interference from adjacent 20kHz channels.

The DCC clearly wish to avoid any conflicts of interest and request that you send your comments on the proposal without delay to the RSGB DCC Secretary, Iain Philipps G0RDI. You can contact Iain via Packet radio @ **GB7TUT** or by telephone on **(01494) 432144** (but not after 10pm). Alternatively you can send your proposals or comments by **FAX** on **(01494) 725545**.

Beacon News

The 144MHz beacon **GB3VHF** (JO01) returned to service on the April 20 having been off the air for over three months. The beacon, currently operating on 144.925MHz, is now over 25 years old.

A new unit is under construction and is due to be installed when the new beacon band plan is implemented. This phase of the 144-145MHz sub-band re-organisation is expected to take place after June 1997.

Contests

Now I'll turn to news of some contests coming up soon. The RSGB are holding a 144MHz Backpacker event on Sunday **June 15** between 0900-1300UTC. On the same day as the PW 144MHz QRP issue (see *PW* June for full details).

On the following Saturday, **June 21**, the UK Six Metre Group are holding their world-wide 50MHz contest. It's a 24-hour event between 0000-2400UTC.

On Sunday **June 22** between 0900-1500UTC there is a 70MHz 'phone contest organised by the Worked All Britain (WAB) group. One of the biggest events of the year, v.h.f. national field day, is being held on July 5-6.

You'll find a terrific amount of activity on all v.h.f., u.h.f. and microwave bands during the weekend. The contest lasts 24-hours, commencing at 1400UTC.

Deadlines

That's it again for another month. And I'm surprised that no one has provided any input to the annual table.

So, please send me your list of locator squares, counties and countries worked on any band. And don't forget that I'm also including satellite contacts as well.

Forward any news, views, comments or photographs to reach me no later than **Saturday June 28**. Send them to me at **Yew Tree Cottage, Lower Maescoed, Herefordshire, HR2 0HP**. You can also contact me via Packet radio @ **GB7MAD**, the UK DX Cluster @ **GB7DXC** or E-mail via **davebu@mdlhr1.agw.bt.co.uk** Alternatively you can telephone me on **(01873) 860679**.

END

LEIGHTON SMART GW0LBI

HF FAR & WIDE

Leighton Smart GW0LBI introduces his monthly report on YOUR h.f. activities. It's the column that just can't work without input from PW's h.f. operators and listeners!

The month of April brought better conditions on h.f. it seems. A number of our reporters have indicated that 21MHz has been improving steadily over the recent few weeks. However, it appears that the band has been quite 'flat' at certain times, yet a quick 'CQ 15' has brought back a DX contact or two.

Just goes to show that if we're all listening and not calling, then the band will remain 'flat' won't it? This is certainly true of the higher frequency bands.

I think that after the long sunspot minimum, we amateurs tend to listen briefly on the 21, 24, and 28MHz bands. Finding no activity, and assume that the band is 'closed' and refrain from calling CQ.

But it's worthwhile putting out a call for a few minutes just in case there is sufficient propagation to allow two-way contacts to be held. As we begin to approach the upturn in sunspot activity perhaps trying this approach may reap dividends.

Talking of solar activity, there was a massive solar flare at the beginning of April which adversely affected short wave (h.f.) communications. It was even reported on the BBC Evening News, and more than a few of our reporters mentioned it in their logs this month.

Solar flares tend to cause h.f. signals to fade out, often completely, sometimes for just a matter of minutes, more often for hours or even days. Thankfully they don't take place too often, otherwise we'd have nothing to report!

News Snippets

Some news 'snippets' now from the RSGB's weekly *DX Newsheet*, starting with news that Mark ON4WW is active from Rwanda again as 9X4WW, QSL to ON5NT, while Charlie K4VUD is hoping to be operational from Bhutan (A5) in July. If you worked 9M6TCR or 9M6TPR (Spratly Islands) in March, send your QSLs via KQ1F.

From Iraq, Sanyi HA7VK will be active here as YI9VK from the 12th of May to the 12th of July, using c.w. and s.s.b. on all h.f. bands, QSL via HA0HW. On 'Top Band' Tony ZL2AGY in New Zealand is active on 1.829MHz c.w. between 1830 and 1900UTC (his sunset) looking specifically for European stations.

Balearic Islands

I've recently received a letter from **Douglas Byrne G3KPD** who is the Honorary Curator of the National Wireless Museum GB3WM. Douglas recently took a holiday in the Balearic Islands, sunny Majorca to be precise, and spent some time in the shacks of **Pablo EA6BM** and **Mateo EA6BG**.

Both Pablo and Mateo speak excellent English, says Douglas, and particularly enjoy working stations in the British Isles. He also says that judging by the antenna arrays they use, is there any wonder that they put out such good signals? Quite right Doug...they've obviously got excellent stations, as you can see from **Figs. 1** and **2**.

Listening Watch

Steve Locke GW0SGL reports that he has been called a number of times by stations who had **specifically listened** for him on 14MHz after reading the *PW* Listening Watch section. The most recent was a Canadian station, who, it turned out was a Welsh exile!

The Canadian amateur it turned out, had lived in the same street as Steve up until the late 1960s! He asked Steve to pass on his regards to a few of the older generation who still live in the village! (Makes you wonder what'll turn up next, I suppose!).

Your Reports

Into your reports now, starting with 1.8 and 3.5MHz First in the 'pile-up' of 11 reporters this month comes **Ted Trowell G2HKU** on the Isle of Sheppey in Kent. Ted worked HB9JAI (Switzerland), PA3BDQ (Netherlands), OY3JE (Faroe Islands), GJ/DK1RP/P (Jersey), and SM5AKF (Sweden) on 1.8MHz c.w. at around 2100UTC

Here at GW0LBI I put up a new larger antenna this month and on 1.8MHz hooked up with VE1ZZ (Canada), OK1AWZ (Czech Republic), OZ7MA (Denmark), UA4UDF (Russia,) and UA2FT (Kaliningrad), and our very own Ted G2HKU at around 2300UTC with 5W of c.w. A switch to 10W s.s.b.

Fig. 1: Pablo EA6BM in his well-equipped shack. A fluent English speaker...he's always on the look-out for stations in the British Isles.

resulted in contacts with 9A1A (Croatia) LY7A (Lithuania), and LA8AJA (Norway) at around 2330UTC.

'Armed' with a new rig is **John Whitton 2E0APL** in Wirral, Merseyside. John's Sommerkamp FT-7B has been modified to run 3W r.f. output. His log this time around includes 3.5MHz c.w. contacts with GM4XDN, F5UMP (France) at 1851, PA3ALX (Netherlands) at 1840, *PW*'s 'resident' cartoonist **John Worthington GW3COI** at 1628, and G5WW at 1331UTC.

Also busy on 3.5MHz has been Steve Locke GW0SGL of Mountain Ash in Mid-Glamorgan. Steve's log shows 100W c.w. contacts with 7X4AN in Algiers, VY2CC (Prince Edward Island), and OY1G (Faroe Islands), while 100W s.s.b. accounted for K5MM (Arizona USA), and 7X5JF (Algeria). Steve's antenna for 3.5MHz is a full sized G5RV dipole up at about 30 metres.

The 'key' has been taking a bashing again at the shack of **Carl Mason GW0VSW** in Skewen, West Glamorgan. Carl's 3.5MHz log shows c.w. contacts with W8WW (USA) at 0216, and EU1AN (Belarus) at 2316UTC. Also logged were TF3DX (Iceland) at 0649, GW0LBI in the GW QRP Club contest at 1520, and GJ/DK1RP/P (Jersey) at 0531UTC.

The 7MHz Band

Yet again, '40' has provided some nice DX contacts for **Sean Gilbert G4UCJ** of Milton Keynes, who says although his static level on the 7MHz band has increased of late, he still manages to work some 'rare stuff'.

Sean hooked up with XE3RT (Mexico) at 0203, 3B8CF (Mauritius Island) at 0214, PJ9JT (Netherlands Antilles) at 0224, VP5/KB4IRS (Turks & Caicos Island) at 0242. Also worked were J79MV (Dominica) at 0258, VP2EUC (Anguilla) at 0729, C56/DK3FW (Gambia) at 0749, and CD3ZD (Cuba) at 2335UTC, all on c.w. at around 50W.

The s.w.l. log from **Charlie Blake M0AIJ** (also in Milton Keynes) shows that he has been 'up with the larks' again! Between the hours of 0600 and 0800UTC, Charlie reports reception of ZL1ACE (New Zealand) working I0WV in Italy, V44NEF (St. Kitts & Nevis Islands) in contact with CT1CBI in Portugal.

Also appearing in M0AIJ's reception log were OA4CPI (Peru) working DL7VRO in Germany, CO2DC (Cuba) working HB9KNA in Switzerland, and VI3GP at the Melbourne Grand Prix working LZ5DB in Bulgaria (this one at 2031UTC).

Meanwhile, Charlie's transmitting exploits on 7MHz provided him with s.s.b. contacts with 7X0AD (Algeria) QSL via EA4URA, Marconi Special station EI5SPD (Eire), TP9CE (at the Council of Europe) and 9A50D (Croatia). The latter was a special call celebrating 50 years of amateur radio in Dubrovnik.

The 10MHz Band

The narrow but effective 10MHz band provided **John Constance G0VGD/2E0ANZ** (Aylesford in Kent) with contacts with Europe and Africa. These came in the shape of SM3VDX (Sweden) at 1826, S51EC (Slovenia) at 1935, OK1UDM (Czech Republic) at 1010, EA8BPY (Canary Islands) at 1559, and C56/DK3FW (Gambia) at 0252UTC.

Ted G2HKU offers one contact on the 10MHz band, with TF/DL8WAM (Iceland) at 1700,.

Carl GW0VSW on the other hand hooked up with OY2H (Faroe Islands) at 1141, EK7DX (Armenia) at 1618 QSL via Box 54, 375010, Yerevan, Armenia, and C56/DK3FW (Gambia) at 2150UTC.

The 14MHz Band

I'm starting off the 14MHz band reports with a 'welcome back' greeting to **Don Mclean G3NOF** of Yeovil, who is now back on the air after a long illness. Glad to hear you're much better Don!

Don's monthly h.f. propagation report says this time around that "I've found conditions on the bands rather poor, apart from 14MHz. This has been the best DX band with the best conditions on the short path from 1600 to Australia and Asia up to around 1900UTC. I've heard nothing on 28MHz, although others have noticed openings there, and on 21MHz there have been some US stations heard, plus some Africans. Meanwhile, 18MHz was open to the Middle East. Around noon there were a few openings to Australia and Japan, with north Americans from noon to around 1700UTC".

The G3NOF log shows his s.s.b. contacts on 14MHz with BV5BG (Taiwan) at 1627, DU1SSR (Philippines) at 1545, HS0/G4UAV (Thailand) at 1839, N7QXQ/HR6 (Honduras) at 2035UTC (QSL via W7TSQ). Also reported were J77FT (Dominica) at 2158 (QSL via DL7FT), SU0ERA (Egypt) at 1348, XU2FB (Cambodia) at 1847 QSL via N4JR, ZS1ESC (South Africa) at 1917, 4S7SW (Sri Lanka) at 1743, 5X4F (Uganda) at 1919 QSL via K3SW, 9G1PD (Ghana) at 1819 QSL via Box 771 Takoradi, Ghana), and 9X/RW3AH (Rwanda) at 1949UTC.

with 5W or less from an Index Laboratories 'QRP Plus 'rig and a W3EDP antenna.

Meanwhile, **John Heys G3BDQ** (he of the wire antennas fame!) mentioned the solar flare on the April 1st which almost 'took out' even local stations with him! Nevertheless, John says the bands recovered after a few days, and his log shows 14MHz contacts with ZL2BB (New Zealand), RA1AD (Arctic Russia), BV7GA (Taiwan) and KB4COO/MM (on board Cunard's RMS *Queen Elizabeth II*) all on s.s.b. while his c.w. accounted for contacts with C6A/DL6MHW (Bahamas), AP2HA (Pakistan) JA8HIO (Japan), and 9M8FC (Malaysia).

John mentions 'Super DXer' Don McLean G3NOF in his letter, and says he first met him in 1947. He wishes Don well in his recovery as do we all of course.

Sean G4UCJ spent most of his operating time on 14MHz by the look of his logs this month around. With 50W output on c.w. and G5RV and 'Mini Beam' antennas, he worked K9AW/KH2 (Guam) at 1322, UA0FZ (Sakhalin Island - the one just above Japan, that is!) at 1136, AP2HA (Pakistan) at 1455, 9M6TPR (Spratly Island) at 1522UTC.

Also logged were 3W5RS (Vietnam) at 1535, JA8BGR (Japan) at 0744, and ZL2VS (New Zealand) at 0830. Next came 7Z5OO (Saudi Arabia) at 1340, TR8BAR (Gabon) at 0624, CX3AL (Uruguay) at 2134, and 9X/RW3AH (Rwanda) at 1958UTC.

The 18MHz Band

Up to 'seventeen' now, and by all accounts the 18MHz band has provided some reliable DX traffic over the past month.

New reporter **Chris Knowles M0ABO** of Bolton in Lancashire has been busy on both the 18 and 21MHz

Fig. 2: Mateo EA6BG is another fluent English speaker often on the look-out for stations from the British Isles. And as both EA6BM and EA6BG have extremely impressive h.f. antennas you may well hear them! (Photos courtesy of G3KPO)

It's exam time for arch 'QRPer' **Eric Masters G0KRT** in Worcester Park, Surrey, so his radio time is quite curtailed. (Good luck with the exams Eric!). He offers c.w. contacts with LZ1SM (Bulgaria) at 1521, IT9TPJ (Italy) at 1504, and RX3DQD (Russia) at 1919UTC. All QSOs were achieved

bands of late. His first log shows contacts using 100W of s.s.b. into a home made multi-band antenna. His 18MHz list includes HK3AO (Columbia) at 1320, KN4UG/VP5 (Turks & Caicos Islands) at 1354, XE3VD (Mexico) at 1444,and 9K2HN (Kuwait) at 1600UTC.

Ted G2HKU has also been spending some time on 18MHz as his log shows. All c.w. is our Ted's approach, and he hooked up with VQ9VK (Chagos Island) at 1100, 5X1P (Uganda) at 1400, VP2EUC (Anguilla), VY2SS (Prince Edward Island) and XT2AW (Burkina Faso) at 1500UTC. However, in a certainly rare moment for Ted, he actually picked up the microphone and worked G0SVR/MM who was on board the Cunard line's RMS *Queen Elizabeth II* in the Suez Canal.

With a new rotator on his TH7 beam antenna (which he says certainly helps!) Steve GW0SGL has been lapping up the DX on the higher bands. His 18MHz log includes s.s.b. contacts at 100W with 5Z4BZ (Kenya), CN8NM (Morocco), 7X0AD (Algeria), 9K2NG (Kuwait), TA3BP (Turkey), VQ9VK (Chagos Islands), and A41LZ (Oman) QSL via Box 2837, Ruwi, Oman.

For his 18MHz report Don G3NOF, now back on the microphone offers s.s.b. contacts with A61AJ (United Arab Emirates) QSL via Box 15003, Dubai, at 1019, EM1HO (Antarctica) at 1635UTC (QSL via I2PJA). Also logged were, FG5HR (Guadeloupe) at 1251, SU3AM (Egypt) at 1120 QSL via DL1FCM, VP2END (Anguilla) at 1700, and 5X1T (Uganda) at 1843UTC.

The 21MHz band

In many ways it's been reassuring to hear that the 21MHz band has been open for some decent DX lately. As usual, our reporters are 'quick on the ball' and never let an opportunity pass by if they can help it!

Chris M0ABO reckons 21MHz has got to be one of his favourites since he became an 'A' licensee. He reports 100W s.s.b. contacts on the band with FM5OM (Martinique) at 1632, and LU3FPA (Argentina) at 1635UTC.

Also logged were A41LD (Oman) at 1335, 4X4ZM (Israel) at 1340, ZS6J (South Africa) at 1400UTC. He also contacted ZD7HI (St. Helena Island) at 1512, as well as HF0POL (King George Island - South Shetlands) at 1550 (QSL via SP3FYM), and finally D2EV (Angola) at 1635UTC.

Last but not least for this month comes John G0VGD/2E0ANZ whose 21MHz log includes s.s.b. contacts with 7X0AD (Algeria) at 1610, 6W1HM (Senegal) at 1407, SV1DET (Greece) at 1229, and VE3WIB (Canada) at 2121UTC.

It certainly looks as if the higher bands are at last improving to a reasonable degree. Judging by the reports for the higher frequencies this month, it seems that the openings, particularly on 18 and 21MHz, have provided amateurs with some decent DX. Hopefully by the time you read this (I'm writing this in April, by the way) they may be open more or less every day. Well, I suggest we keep our fingers crossed!

Signing-Off

Well that's it for this months folks and it's signing-off time! Thanks to all reporters for their resolute support for the column. **ALL reports are welcome**, it doesn't matter if your antenna is (like mine!) a bit of wire hanging out of the window!

Let other readers know what **YOU** are getting out of h.f.! What you the reporters write, gives encouragement to others, particularly newly licensed radio amateurs who appreciate as much information as possible. So thanks again.

As usual, reports and information (and photos!) by the 15th of each month to: Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 710749 (9am - 6pm).

END

PW Listening & Operating Watch List
(All times UTC)

Charlie Blake M0AIJ listens: 0500-0700 on 7.061MHz s.s.b. with an NRD 525 receiver and sloping wire antenna.

Steve Locke GW0SGL operates: 1100-1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940 and TH7 beam antenna, normally beaming to other countries.

Oon McLean G3NOF operates: 1030 Saturdays on 3.685MHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net 3.665MHz s.s.b. using a Kenwood TS-950 and trapped dipole antenna.

Steve Locke GW0SGL operates: Most afternoons around 14.200MHz s.s.b. using a Yaesu FT-1000 and TH7 beam antenna.

Leighton Smart GW0LBI operates: Most Sundays (and some weekday evenings) at around 1000-1300 on 1.933 or 1.949MHz s.s.b. using KW 2000A/FT-747 transceivers and a long wire Marconi antenna.

Rob Mannion G3XFD listens and operates: (weekdays & weekends) 1800-1830 3.7MHz 100W s.s.b., and 3.530MHz QRP c.w. using an Alinco DX-70 transceiver and trapped dipole and long wire antennas. Also at 2300 on either 3.530, 7.025MHz (c.w.) or 3.7MHz s.s.b.

Sean Gilbert G4UCJ operates: around 1030 to 0200 (on and off) most weekdays and weekends on 7 and 14MHz using an FT-307 transceiver at 70W maximum and a G5RV antenna.

Terry Ibbitson G0VTI operates: each evening between 1900-2000 on or around 7.020MHz c.w., or 14.035MHz c.w. using a Ten Tec Scout at 50W.

MIKE RICHARDS G4WNC

BITS & BYTES

This month Mike Richards G4WNC looks at a text editing program, a useful reference program and has a preview of a spectrum analyser.

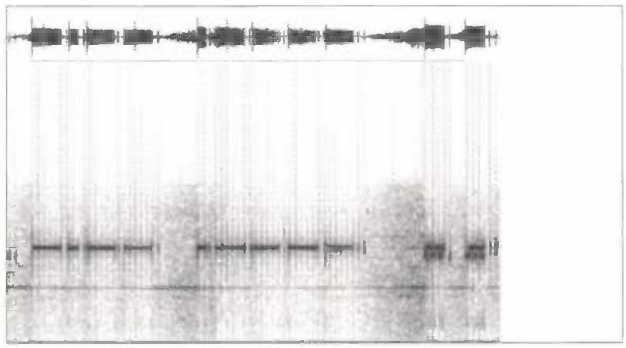

Fig. 1: A sample of c.w. signal analysis received using the Spectrograph program.

One of the essentials for any computer system is a decent text editor. I don't mean a word processor although these are undoubtedly very handy.

What I mean is a highly flexible text editor that can be used to edit all manner of text files. If you're in to the Internet and have your own home page, a good example is .htm(l) editing.

Whereas a good HTML editor like *Hot Dog* is great for the original page creation, it tends to be very slow if you just want to make a few changes to your page. Typically you might just want to update the address in a couple of links or maybe just add an extra item. By far the quickest way to do this is to use a text editor.

Even better is a text editor that includes support for .htm(l) commands. This is where *TextPad* comes into its own as it identifies these files from their extension.

TextPad then opens the selected file in the appropriate editing mode. This really is a quick way to update a Web page.

That's by no means the end of it as *TextPad* can handle a huge range of files including hex files for those that want to get into some serious file hacking. You can also use *TextPad* to simultaneously edit multiple files with up to two views per file.

You can also use *TextPad* as a straight word processor as it includes an excellent range of formatting tools. It even has a spelling checker that can handle ten languages along with an armoury of macros and hot keys.

So, as you can see that *TextPad* looks to be a very powerful utility that's virtually a must-have - what's more it's British. For more information contact **Helios Software Solutions** either at their Web site at: **http://www.textpad.com/** or by 'phone on **(01772) 324353**.

HamCalc

If you've ever wanted to try designing an new antenna or maybe to build a simple audio filter you'll know that you need some form of reference to look up the appropriate formulas. An even better answer is to go for a computer program that does all the hard work for you.

If you look through any shareware catalogue you will find that all manner of programs are readily available. The problem is having the particular program to hand when you need it.

If you're like me you won't have the patience to write away to get a suitable program. Well the answer to the problem could well be found in **George Murphy VE3ERP's** suite of amateur programs that can be found under the overall title of *HamCalc*.

For simplicity, all the programs are written in GWBasic and the package even comes with its own version of GWBasic, so there's no excuse for not being able to run it. The other big advantage from using such a simple language is its ability to run comfortably on just about any PC, including many emulation systems.

The use of Basic also means that it's quite easy to customise the programs if they don't quite provide what you need. Now what's really different about this suite of amateur radio programs is the sheer range of topics that are covered.

There are a grand total of 164 main programs and some of them have sub-programs so the full count is even greater! This is a truly huge collection that should cover just about every amateur's requirements.

Here's a few examples picked at random to give you a flavour of the range: Bobtail curtain antenna design, discone antennas, waveguides, MUFs, satellite orbit calculator, latitiude and longtitude calculator, miniature coils wound on screws, Smith chart and loads more. Clearly a very useful collection.

The version I had was v.27 dated 25 March '97 and the latest additions were: antenna frequency scaling, grid square locator, *J* calculator, meteor shower predictor and moon tracker. You should find that HamCalc is available from most shareware suppliers with a good stock of radio related software. Alternatively, you can find it on the Internet as **hcal-27.zip** (713,820 bytes long).

Spectogram Preview

This is just a taster as I don't have room this month to do the *Spectrogram* program justice. I've recently spent a few hours trawling the Internet to try to find a few audio analysis tools that may prove useful in amateur radio. I was inspired to do this following the remarkable interest in the *sbfft* program I featured a few months ago.

I will provide full details next month, but I just had to let you know about a freeware program called *Spectrogram* by **Philip VanBaren**. This is commonly distributed with the file names **gram.zip** or **gram23.zip** for the Windows 3.1 version and **Gram32.zip** for the Windows '95 edition.

Philip's excellent program lets you record audio signals using a standard PC sound card and then perform complex analysis so that the frequency spectrum can be displayed graphically. The later, Windows '95 version, even supports real-time monitoring of incoming signals - this makes a great tuning indicator for RTTY, Packet, AMTOR, etc.

The program comes with all manner of options to customise the sampling and analysis process. Although it will work with just about any PC that can successfully run Windows 3.1 or '95, a fast PC is required to make best use of the real-time analysis.

In addition to making an excellent tuning indicator, *Spectrogram* can be immensely powerful for analysing all types of signals. If you have a receiver that can be set to a wide receive bandwidth you can use Spectrograph to monitor the audio bandwidth usage. Another option is to use the analysis tools to better understand an interfering signal.

As I said, there's far too much to fit in here. So, just to whet your appetite, I've included a screen-shot (**Fig. 1**) of a Morse signal.

For those that can't wait, you can find the programs at the following locations on the Internet: **http://www.winsite.com/info/pc/win95/sounds/gram32.zip** for the Windows '95 and **http://www.winsite.com/info/pc/win3/sounds/gram** for Windows 3.1.

Special Offers

If you'd like a copy of Hamcomm/JVFAX, etc. I've arranged a very special offer with the **Public Domain and Shareware Library (PDSL)**. They have put together a library set of all five disks for just **£12**, all inclusive.

Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by 'phone - you don't even have to write a letter. Please direct all orders and enquiries about this disk set to **PDSL, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298** and request library volume: **H008739abcde**.

The software is only available as a set of five disks as follows: IBM PC Software (1.44Mb disks): **Disk A** - JVFAX 7.1, HAMCOMM 3.1 and WXFAX 3.2; **Disk B** - DSP Starter plus Texas device selection software; Disk **C** - NuMorse 1.3; **Disk D** - UltraPak 4.0 and **Disk E** - Mscan 1.3 and 2.0.

Cheerio for now please keep your news and views coming to me **Mike Richards G4WNC at PO Box 1863, Ringwood, Hants BH24 2ZD** or via **E-mail** to **mike.richards@dial.pipex.com** You can also visit my Web site at **http://dialspace.dial.pipex.com/mike.richards/**

END

PETER SHORE

BROADCAST ROUND-UP

This month Peter Shore has news of cuts planned for two European broadcasters and details of the sale of a short wave service.

Is there still a role for international radio broadcasting? The answer varies between perhaps yes, and no, depending on who is answering the question. The saga of **Radio Australia**'s future rumbles on with protests from many quarters at the savage two-thirds cut to the stations annual budget of AusS23 million.

The result of this cutback is likely to be the ending of services in five Asian languages: Mandarin and Cantonese to China, plus Indonesian, Khmer and Vietnamese.

English will remain on the air, however, with broadcasts via short wave, albeit at a reduced level, plus satellite transmission, including, it is thought, relays to Europe and North America via World Radio Networks English-language satellite service.

Derek White, Radio Australia's General Manager, commented that he was "very, very disappointed. It is at least pleasing that we will apparently retain our English service that we will continue our short wave coverage of the Pacific, and that we will retain our Tok Pisin service to Papua New Guinea. However it would be extremely disappointing if we have to end our services to Asia in the languages which deliver the greatest audience and which play an enormous role in building an image of Australia in the region".

A former Radio Australia head, **Peter Barnett**, who ran the station during the 1980s said that the budget cuts were "nothing short of a national disaster". Well over 2,000 submissions have been received by the Australian government committee established to investigate the need for international broadcasting from Australia, and all but a handful gave full support to maintaining the service. The Committee was due to report its findings on 5 May.

Planned Cuts

Cuts are planned in the output of two European broadcasters in the coming months. **Radio Vlaanderen International**, part of BRTN, the Flemish-language public broadcaster in Belgium which is currently undergoing a major restructuring, will lose its German, Spanish and Arabic language programmes when the winter schedules come into effect at the end of October.

If you are in Europe, you can listen to *Brussels Calling*, the daily English programme from Belgium at: 0630 on 6.035, 9.925 and 9.94MHz short wave plus 1512kHz medium wave 0900 on 6.035 and 7.19MHz, 1800 on 5.91MHz and 2030 via World Radio Network on the Astra satellite 2100 on 5.91MHz short wave plus 1512kHz medium wave.

Ceasing Broadcasts

Deutsche Welle (DW) will cease Danish, Norwegian, Dutch, French and Italian language broadcasts at the beginning of 1998. These services are the last remnants of Deutschlandfunk, the German pan-European broadcaster which was absorbed into DW after the fall of the Berlin Wall.

English to Europe continues on medium wave at 2000UTC on 5.96 and 7.285MHz short wave, plus the Astra satellite. The five language services affected have about 50 staff, and some will be redeployed in other areas of DW, while others will take early retirement. Some 1,400 people are employed by DW radio and television in Cologne and Berlin.

Up For Sale

There is a further closure likely during the next twelve months. **Monitor Radio International**, the international short wave service of the *Christian Science Monitor* (CSM) newspaper, is up for sale. The CSM has decided to concentrate on newspaper publishing and so wants to dispose of the global radio service that went on the air ten years ago from Boston.

Monitor Radio's first short wave transmitting station at Scotts Corner, Maine, was sold a couple of years ago, and services were beamed from its remaining North American short wave site at Cypress Creek, South Carolina, and from Saipan in the Pacific. These high-power and well-engineered facilities are likely to be sold or leased to other broadcasters.

Survived Threats

Radio Canada International (RCI), which has survived threats of closure each Christmas for the past couple of years is in the news again. The service's head, **Terry Hargreaves**, who has steered RCI through difficult times and fought for continued funding, was moved suddenly to CBC domestic radio at the end of April.

Terry Hargreaves' deputy, **Alan Familliant**, took early retirement almost simultaneously. No one knows why this happened, but cynics might venture the opinion that Hargreaves and Familliant spoke out too loudly and too regularly against CBC and the government for some people's liking.

Tune to RCI in English at: 1330-1400 on 11.935, 15.325 and 17.82 (not Sunday); 2000-2100 on 5.995, 7.235, 11.69, 13.65, 13.67, 15.15, 15.325, 17.82 and 17.87MHz, 2100-2130 with CBC domestic radio, including on Saturday the amazing *Royal Canadian Air Force*, on 5.995, 7.235, 11.69, 13.65, 13.67, 15.15, 15.325 and 17.82MHz.

The RCI station is also available via World Radio Network in Europe at 0930 weekdays.

Back On Air

Regular readers may remember that in April's edition, I mentioned the **Voice of Malta** (VoM) which is now back on the air. A correspondent in Malta has been digging around since my column reached him, and he tells me that the Japanese service which VoM said it planned to start is to promote Malta as a tourist destination in Japan.

I wonder how successful the idea will be, given that short wave listening in Japan has declined radically despite the availability of top-flight receivers from manufacturers like Sony.

Summer Schedule

The summer schedule for the **Voice of Russia** (VoR) has arrived on my desk. English to Europe is carried mainly in the evening, with a medium wave service during some early morning hours.

The service appears to originate from a 150kW transmitter at Petrozavodsk, and I wonder how well it can be received, let me know if you can hear the signal: 0200-0300; 0600-0900; 1000-1100 on 612kHz medium wave; 1500-1600 on 9.73MHz short wave plus 612, 1089 and 1494kHz medium wave; 1600-1700 on 7.29, 7.35, 9.73, 9.765, 9.775, 9.88, 11.675, 15.40 and 15.43MHz plus 612, 999 and 1467kHz medium wave; 1700-1800 on 9.765, 9.775, 9.88, 15.40MHz plus 1143 and 1467kHz; 1800-2000 on 7.29, 7.35, 9.765, 9.775, 9.88, 11.675 and 15.40 plus 1143 (to 1900) and 1467kHz; 2000-2100 on 7.35, 7.37, 7.44, 9.62, 9.665, 9.775, 9.88 and 11.675MHz plus 1467kHz 2100-2200 on 7.25, 7.35, 7.37, 7.44, 9.62, 9.665, 9.71, 9.74, 9.765, 9.775, 9.88 and 11.84MHz plus 612 and 1467kHz medium wave.

That is all I have this time around. Look out next month when I will be test driving a portable receiver that might suit holiday makers who want to keep in touch without being burdened by lots of heavy listening gear! Until then, enjoy tuning the short wave broadcast bands, and keep me in touch with your interesting finds.

END

ROGER COOKE G3LDI

PACKET PANORAMA

Roger Cooke G3LDI has news of a special presentation in honour of commemorating the site of the original Marconi transmitting station.

When I was in Australia a couple of years ago, I paid a visit to **Jo Harris VK2KAA**. Jo lives in Wahroonga and is on the committee of the **Australian Amateur Packet Radio Association** (AAPRA). We swap the occasional message via my Satgate and Jo also sends me the AAPRA bulletin, from which I have quoted in the past.

Jo is very active on Packet and can be contacted at **VK2OP**. She is very methodical and must love documentation. Those books you can see on her shelf in **Fig. 1** are a complete VK callbook!

The VK callbook is a callbook that has photographs, full personal details and a potted history of each individual. It did occur to me that possibly this information might be more condensed on a computer! Jo is shown in **Fig. 1** with **David Ramsay**, the President of AAPRA.

Special Trip

Jo is coming to the UK this year, and is making the trip for a special reason. Jo is also the President of the **Wahroonga Amateur Historical Radio Association**, with the call **VK2WAH**, and a historian of the **Wireless Institute of Australia**.

She is in communication with **Dewi Roberts GW0ABL**, shown in **Fig. 2**. Dewi is the Chairman and Publicity Officer of the **Dragon Amateur Radio Club** in Gwynedd, close to the site of the original Marconi transmitting station, at Ceunant, between Llanrug and Waunfawr, nr Caernarfon.

Jo was concerned that although the buildings still remained at Waunfawr, this historical event was not commemorated in any way at the old transmitting station. So she voiced her opinion that any such emblem should come from the Australian side.

Working hard to achieve this ambition, Jo commissioned a copy of the original monument, shown in **Fig. 3**, to be cast in bronze. The figure of Mercury will be standing on a globe of the Earth, just like the original, but the globe will then be mounted on a nine inch square piece of Pacific Maple.

This statuette will be three feet high and weigh 15kg. On one side of the globe will be 'Waunfaur, Wales', and on the other 'Wahroonga, Australia'. There will be a plaque on the plinth with the inscription:

"From this site on the 22nd Sept., 1918, Guglielmo Marco transmitted the first direct wireless message to Australia, where it was received by Ernest Fisk at Wahroonga, N.S.W."

In smaller letters will be the words:

"Presented by Jo Harris VK2KAA, on behalf of friends of wireless in N.S.W. Australia. July 1997."

Secure Display

The Dragon Amateur Radio Club will provide a suitable and secure display cabinet so that the replica monument will be permanently shown at the old transmitting station. A copy of the original message that was transmitted from Waunfawr to Wahroonga is shown in **Fig. 4**.

Jo will be travelling to the UK in June and will be staying several weeks, also making the journey up to Norwich for the annual Norfolk AX25 Group Barbecue as an honoured guest at the end of June. Now that is a long way to come just for a burger!

This year will be the tenth anniversary of the Norfolk BBQ, so we are looking forward to a great day. We usually have around 100 people attending and keeping Jo company will be **John Bays VK2SB**, who will also be visiting the UK.

I hope to have photographs of the actual presentation when it takes place in July and hope to feature them in a future 'Packet Panorama'. In the meantime, both Jo and Dewi will be corresponding by Packet up until the time she leaves for the UK.

That's all for this time so happy packeting from me **Roger G3LDI @ GB7LDI**. News can be sent to me can be sent either QTHR, via Internet at **mtaylor@uk.mdis.com** or by telephoning **(01508) 570278**.

Fig. 1: Jo Harris VK2KJAA (right) with David Ramsay VK2KLX President of AAPRA.

Fig. 3: The original Marconi Monument.

Fig. 2: Dewi Roberts GW0ABL outside the Marconi station.

Fig. 4: A copy of the original message that was transmitted from Waunfawr to Wahroonga (see text).

END

Due to the fast turn around of popular secondhand items, readers should check on availability of advertised stock. In other words...if you spot something you fancy...don't delay or you could miss it!

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Yaesu FC-757 automatic antenna tuner £229.00
Icom IC-745 100W general coverage HF transceiver with fitted AC power supply & desk mic £489.00
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Yaesu FT-707 100W 80 - 10M HF transceiver c/w desk mic £329.00
Icom IC-735 100W General coverage transceiver c/w mic £599.00
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PX PRO2032 Realistic B/Scanner £149
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Compiled by Zoë Crabb

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ATU Vectronics, model VC300LP, new, £85 o.n.o. Tel: (01283) 221870.

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Kenwood TM-241E 2m (144MHz) mobile, boxed, v.g.c., 12 1/2kHz spacing, 5/10/50W output, £160. Spectrum 6m (50MHz) linear amp, 500mW input, 20W output, £40. Spectrum 6m (50MHz) transverter boards, working, £15. G0VFZ, QTHR. Tel: Tewkesbury (01684) 299420.

Kenwood TS-940S with SP940 speaker, all options, except voice unit, £1000. FTV107R 2m (144MHz) transverter, £120. 10/15m (21/28MHz) 3-element beam, £120. All mint and boxed. Tel: Wilts (01722) 743270.

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Microwave Modules MML 432/100 linear amplifier, 432MHz, 100W, very good condition, £145. Michael Watkins, Kent. Tel: (01227) 266460.

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Pye Westminster 4m (70MHz) transceiver, good working order with manual and circuit diagram, crystals for 70.26, £25 (carriage extra). GW0GHF, QTHR or 'phone on (01222) 703429.

RN Electronics 6m (50MHz) transverter, 25W 2m driver, £120. Colin GW3WSU, Vale of Glamorgan. Tel: (01446) 738756.

Sangean ATS803A digital portable radio, memories plus s.s.b. in immaculate condition, £75. Tel: (01450) 377861.

Sangean ATS803A world band portable, all features, including s.s.b., mint condition, still boxed with manual, £65. Tel: Wolverhampton (01902) 790260.

Several Eddystone receivers, also Clarke & Smith and civilian wartime, please call for further details. Peter Lepino, Surrey. Tel: (01372) 454381 or (0374) 128170 anytime.

Shack clearance, items include Kenwood s.w.r./pwr meter, £40. Prefer sale in toto, one buyer, s.a.e. please for details of small oddments. A. H. Dent G4KJN, 7 Hesleyside Road, South Wellfields, Whitley Bay NE25 9HB, Tel: 0191-252 8908.

Silent key sale G0HEZ, Icom IC751A TX/RX, PS15 p.s.u., good, £550, carriage extra. SWR l/boomer KW lin amp, 1.8-28MHz inc. WARC, good, £290, carriage extra. NETSET PRO2032 scanner, 200 chs, £75. G3KMQ, Bude. Tel: (01288) 352214.

Sony ICF SW7600G receiver, excellent condition, boxed, complete with compact antenna and manual, £105. Tel: (01983) 854766.

Sony multi-band receiver, ICF-6700W 1.6MHz to 29.5MHz, f.m., m.w., s.w., 1, 2 and 3 dual conversion frequency counter, upper and lower sideband, plus preselector, mains, battery, £50. Tel: Stains (01784) 740373.

Sony professional BW video system, camera AVC3250/AVF3250, 17in monitor, PMV200CE 1in reel to reel recorder, CV2100ACE, various used tapes, £100 o.n.o. Textronix 502 dual-beam scope, £30. FDK 700EX 25W f.m. mobile, £80. Peter G3UXH, Kent. Tel: (01634) 250562.

Sony wide range antenna AN-1, l.w./s.w., 150kHz to 30MHz, boxed, operators handbook, excellent condition, £35. Tel: Cheltenham (01242) 603128.

Ten Tec Corsair Mod 561, Mic700C, remote v.f.o. 263, p.s.u. 960, ATV229B filters, 1.8kHz, 250Hz, 2.4kHz, s.s.b., c.w., no splits, buyer collects, v.g.c., £825 o.n.o. G0MMD, Kent. Tel: (01474) 350576.

Ten Tec Scout, h.f. mobile TX/RX, 50W, mint, boxed, 7 freq. modules, used QRP only, £550. FDK multi 700EX, f.m., 145MHz TX/RX, good order, no mods, £120, carriage extra. Ken G4ZLX, Dorset. Tel: (01258) 455507 weekends or 0118-922 5019 w/days.

Trio JR599 RX with all filters and 2m (144MHz), g.c., £95. Racal RA17L, g.c., £120. Yaesu FT200 with HD, HB, p.s.u. needs attention, £70. CR100 (B28) for spares, £15. David Palmer, 23 Jubilee Terrace, Elmswell, Bury St Edmunds, Suffolk IP30 9DH.

Trio R1000, 200kHz to 30MHz short wave comm receiver with manual, mint condition, £160. Lowe PR150 pre-selector, seven bands, mint condition with manual, cost, £235, sell for, £100 plus postage. Vinc, Cambs. Tel: (01487) 823879.

Trio R1000, v.g.c., £150. Yaesu FT-200, ext. v.f.o., FV200, v.g.c., £180. Racal RA117, reconditioned, v.g.c., £185. RA17, £125. Redifon drive unit GK203N, Redifon PA GA481, 100mW-100W, 3 in no. and PU220 3 no., £360 lot. Circuit HF PA + p.s.u. in case, £60. Tel: Suffolk (01502) 715419 evenings.

TS-530SP, boxed with mic., little used on transmit, excellent condition, £250. KW Viceroy, fault on p.a., free for keen strong enthusiast, buyer collects. Jack G4LLV, W. Midlands. Tel: 0121-743 3151.

US Army signal corps short wave radio, c.w., b.f.o., etc., World War II vintage, £50. Tel: Liverpool 0151-475 8424.

Valves, military and civilian, some numbers of valves: QQV06-40, 11E3, 12E1, 6B4G, TY2-125, 6L6G, 829B, lots of radio valves. Tel: 0113-240 3496.

Yaesu FP757HD power supply with speaker, built-in front, v.g.c., £80. Yaesu FC-700 a.t.u. with manual, excellent condition, £70. Buyer collects, 'phone after 6pm. Peter, Notts. Tel: (01623) 722300.

Yaesu FRG-7700 comms receiver with AT1000 a.t.u., £280 o.n.o. Yaesu FT-221R 2m (144MHz) transceiver, works well, complete with mic. and manual, £175 o.n.o. Len M1BHL, Sidcup. Tel: 0181-309 6499.

Yaesu FRG-7700 communication receiver with FRV-7700 u.h.f. converter, a.t.u. and manuals, both very good condition, £235. Len G0IIL, Stockton on Tees. Tel: (01642) 869856.

Yaesu FRG8800 comms RX, fitted with FRV8800 v.h.f. converter plus FRT-7700 a.t.u., good condition with manual, £330. Microset PT107, 7 amps, p.s.u., £28. Various other items, carriage at cost. Stan GJ6RND, Jersey. Tel: (01534) 36022.

Yaesu FRG8800 receiver with FRT-7700 tuner and FRV-7700 v.h.f. converter, good condition, £400 o.n.o. Kent twin paddle key with home-brew CMOS keyer (ARRL design), £60. George, Wiltshire. Tel: (01225) 754273.

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Yaesu FT-221R 2m (144MHz) multi-mode base station, 12V d.c. or 240V all-mode, mint condition, instructions, mic. and all leads, £230. HF Miller receive antenna, £35 or swap for 6m (50MHz) beam. Gary G7VAU, Runcorn. Tel: (01928) 567707, answerphone if before 6pm weekdays.

Yaesu FT-221R 2m (144MHz) multi-mode, 15W, a.m., f.m., u.s.b., l.s.b., c.w., 12V or 240V, instructions, mic., all leads, g.w.o., mint condition, £230 o.n.o. Re-advertised due to timewaster. Gary G7VAU, Cheshire. Tel: (01928) 567707.

Yaesu FT-23R 2m (144MHz) hand-held, two NiCad packs, dry cell case with NiCad cells, charger, good condition, boxed, £135. Greg G7CUF, London. Tel: 0171-336 0622.

Yaesu FT-290 RII, NiCads, matching 25W amp, mobile mount, all boxed, also 8-element J-beam, £400. Rob M0ANO, Glos. Tel: (01285) 656806 after 6pm.

Yaesu FT-290R 2m (144MHz) all-mode transceiver, recent new NiCads, with speaker, mic., soft case, charger, excellent condition, £200. Jeff, Lancing. Tel: (01903) 750097 evenings.

Yaesu FT-290R 2m (144MHz) multi-mode transceiver, complete with NiCads, case, microphone and NEC remote speaker, excellent clean condition, £175. Also Morse keys, desk mic., s.w.r. meter, etc., all cheap. Mark, Merseyside. Tel: (01925) 228226.

Yaesu FT-415 (144MHz) and FT-76 (430MHz) hand-held transceivers, both with NiCads, charger, soft case, as new and boxed, £125 each or £240 pair. Steve G6XJU, Chandlers Ford. Tel: (01703) 268682.

Yaesu FT-50 dual-band hand-held, NiCad pack, charger, MH34 speaker mic., two rubber ducks, boxed as new, £240 o.n.o. or swap for Alinco DJ G5E. Mike G1HGD, QTHR. Tel: Kenilworth (01926) 513073 evenings.

Yaesu FT-5100 mobile dual-band radio, only six months old, boxed, swap for Yaesu FT-690R MkII or Icom 505GM 6m (50MHz) TX with amp, sell FT-5100, £400 o.n.o. Mick 2E1FCG on (01226) 742971.

Yaesu FT-51R hand-held, complete with big battery and digital handy mic., v.g.c., £250, no offers. Also Heatherlite Explorer h.f. amp, v.g.c., £800, no offers. Any trial. Tel: Wrexham (01978) 755898.

Yaesu FT-736R with 2, 6m, 70, 23cm (50, 144, 430 & 1296MHz), c.t.c.s.s., desk mic, MD1, v.g.c., no offers, £1200. Alan G7TEA, Manchester. Tel: 0161-436 8581.

Yaesu FT-757GX, MH-1B8, mobile bracket, manuals, £550. FC-757AT, manuals, £200. MD-1B8 desk mic., £40. Trio TR9130 2m (144MHHz) 25W all-mode, mobile bracket, manuals, £250. 2m (144MHz) whip, £18. Mobile speaker, £8. Ted Martin G0WYA, Cornwall. Tel: (01209) 211689.

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Yaesu FT-990AC, very little use, excellent condition, boxed with manual, belongs to G4KBN, £975 o.v.n.o. plus carriage. John G4KJV, QTHR. Tel: Chippenham (01249) 720456.

Yupiteru 7100, v.g.c., boxed, as new, with all acc's, inc. Lowe LSA1500 antenna, pole and coax, £270 or exchange for solid state h.f. transceiver with f.m. and 10/11m TX/RX in

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Complete Compaq computer, quite suitable as second PC for Packet (or DOS programs), exchange for tape deck like one missed in *PW* June or IDE hard drive, 170Mb minimum, 340Mb maximum. Please write and collect: Keith Burrows, 10 Basil Street, Stockport SK4 1QL. Messages via OAP on 0161-477 5303 regretfully unreliable nowadays.

FT-200 c/w p.s.u., mic. and manuals, v.g.c., extra crystals fitted, needs alignment, otherwise okay, swap Super Star 3900 or 3900F, must be mint. Tel: Derbys 0115-930 8096.

Kenwood R1000 h.f. receiver, v.g.c., plus Sony video camera and accessories, etc., plus WS62, v.g.c., swap all for Kenwood R5000 if poss. in Scotland (disabled s.w.l.), also looking for FRV7700 type F. John on (01259) 752937.

Kenwood Trio 530SP, unmarked 2nd rig, good listener for 2m all-mode transceiver, same vintage, same condition with 12.5 adjustment, w.h.y.? or sell, £400 nearest. Tel: Shrops (01952) 825983.

Lowrey Holiday Delux organ, home use only, exchange for 70cm (430MHz), 6m (50MHz) transceiver, base scanner, w.h.y.? no hand-helds or small equipment please. G7USX, QTHR. Tel: Colchester (01206) 822436.

Professionally modified Dynar Lynx 2000 2m (144MHz) Rio Westminster boot mount marine rig for any u.h.f. rig, modified p.m.r. mobile amateur handi or similar. Nick, W. Sussex. Tel: (01243) 771829.

Racal MA1720 professional TX driver with matching MA1004 feeder matching unit in good unmodified condition, exchange for professional digital receiver from Racal, Eddystone, Redifon, etc. Dave Jones, 50 New Dock Street, Llanelli, Dyfed SA15 2HB. Tel: (01554) 775790 or (0850) 039059. E-mail: daiungoed@aol.com

Wanted

All early wireless gear, crystal sets, valves, horn speakers, top prices for items made by Marconi, Burndept, Pye, BTH, Gecophone, Ericsson, serious collector, will pay well and collect any area. Jim Taylor G4ERU, No 5 Luther Road, Winton, Bournemouth BH9 1LH. Tel: (01202) 510400.

Any Amateur bands valved receiver, working or not, for school radio club, s.w.l. project, details to: H. Walton, Hill House, Minster School, Southwell, Notts NG25 0LG.

Auto a.t.u. for Icom IC-735, either AT150 or AT160, wanted urgently. Bill on (01407) 760175 evenings.

Cossor Melody Maker 501AX receiver, need glass frequency tuning scale, photo or diagram with details of colour scheme, don't attempt cleaning it, please write and quote your price. Ernest Stagnetto ZB2FK, 74 Kingsway House, Red Sands Road, Gibraltar.

Eddystone EB35, EC10 MkII, any 1000 series receivers urgently required, good condition and working, also Eddystone diecast speaker. Jim McGowan, 20 Keats Avenue, Romford, Essex RM3 7AR, Tel: (01708) 340304.

Grundig radio recorder model C8000 or model C8800 or model C9000, any of these radios will do, good condition. Hugh McCallion, No 8 Strathard Close, Coleraine, Co. Derby, N. Ireland BT51 3ES. Tel: (01265) 43793.

Grundig short wave radio, model Satellit 2400 stereo or Grundig Satellit 1000, Grundig Satellit 1400SL, Grundig Satellit 600/210, Grundig Concert Boy 1100, s.s.b. unit for Grundig 2100. Hugh McCallion, No. 8 Strathard Close, Coleraine, Co. Londonderry, N. Ireland BT51 3ES. Tel: (01265) 43793.

HW8 for spare parts or top cover only. John Bloice G0FJN, 12 Gilpin Road, Oulton Broad, Lowestoft NR32 3NS, Tel: (01502) 518745.

I am trying to obtain or fabricate a capacitor with a value of 0.015µF/15n/1500pF at 30kV to finish the construction of a 'Telsa' coil, please help. D. Allen, Gloucestershire. Tel: (01242) 511750.

Manuals or circuit diagrams for Lafayette HA-350 RX, Codar 70A RX, Yaesu FT-401B tcvr., old Eagle 5 valve RX, old Pye domestic RX model 1101, photocopies would suffice, costs paid. Ed Kelly EI5DR, Cregganavar, Breaffy, Castlebar, Co. Mayo, Eire.

Mullard new transistors, type AF114, AF115, AF116. Tel: (01507) 601489.

Need any info. on telequipment D61 scope, please can anybody help, all expenses refunded. Doug on (01460) 75838.

NRD-525, FRG-7700, R5000 or any good receiver, fitted with v.h.f. J. A. Bird, 27 Manor Road, Bolehall, Tamworth, Staffs B77 3PF, Tel: (01827) 65641.

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Operator's handbook wanted for Racal TA127 transmitter (TA99 linear), also manuals for Racal MA141 distortion unit and Collins KWM-2A. I am also looking for a Racal MA144 a.t.u. for my collection, any help appreciated. Tel: Yorks (01482) 869682.

Plessey GDHM32 24GHz doppler module, please check your junk boxes, required to get more activity going on 24GHz from the south coast, cash waiting. Bob G8VOI, Waterlooville. Tel: (01705) 250830 after 6pm, thanks.

Racal RA217 RX, unmodified, good performer, all original knobs and paintwork, can you deliver or send by Parceline? Price of set and thorough details of condition to: Barker, 29 St. Andrews Court, Benton, Ncle., Tyne NE7 7UT.

Service manual (photocopy okay) for the Philips 22DC652/60E car radio. Tel: Cardiff (01222) 490766.

Valve tester, g.w.o. with instruction, all letters answered, also old domestic radios, valves, etc., can collect. Mr J. Creasey, 4 Low Farm Drive, Folkingham, Sleaford, Lincs NG34 0SP.

VC10 v.h.f. converter for Kenwood or Trio R2000, covers 118-174MHz, please give me a ring if you have one. Tel: Tyne & Wear 0191-413 5831.

VHF/u.h.f. collinear vertical antenna, constructional details for this type of antennas for 144/432MHz, copies of magazine article and books welcome. Hints and tuning will help. Paulo E. Mazzei PY2PH, R. Frederico Ozanan 1760, 14160-000 Sertaozinho, SP Brazil.

Video recorder for square tapes (Betamax), coloured plastic sheets to 'convert' b&w TV to colour and list of Edwardian radio amateurs (wanted for wireless museum). Douglas G3KPO, IoW. Tel: (01983) 567665.

Wanted by new Eddystone convert - any photocopy data, manual, h/book, circuits, service info., mag reviews/articles, re: Eddystone 840C, expenses repaid. Tel: (01636) 816976.

Would the next person parting with an Akai 4000DB (or DS) tape deck for £40 (or less) like one missed in May/June, please let me know first, especially if fairly local. Please write: Keith Burrows, 10 Basil Street, Stockport SK4 1QL. Messages via OAP on 0161-477 5303 regretfully unreliable nowadays.

Yaesu FT-690R 6m (50MHz) radio, either MkI or MkII, cash waiting. Yaesu FT-5100 dual-band for sale, £400, no offers. Swap 5100 for dual-band hand-held + cash difference, e.g. Alinco DJG5 or Kenwood D79E, thanks. Mick 2E1FCG, S. Yorks. Tel: (01226) 742971 after 1600hrs.

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