REVIEWED!

THE KENWOOD TM-G707E
MOBILE TRANSCEIVER

EXCLUSIVE! KENWOOD OSCILLOSCOPE OFFER

June 1998 £2.20
25th YEAR of Service to UK Amateurs

9th June Eighth Annual Open Day Sunday 10am

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STANDS INCLUDE * Yaesu * Icom * Kenwood * Practical Wireless
* Short Wave * RSGB * Ham Radio Today * Plus JUNK AUCTION

C-408 From HORA
70cms Handheld Full CTCSS

£89.95! SPECIAL OFFER PRICE
Full CTCSS; 20 memories; 1.6MHz repeater shift; Priority channel, Scanning, Dual watch; Dual mode squelch; PTT lock; 12.5/25kHz steps; 230mW output - all from just 2 x AA cells

1998 Catalogue
* Largest in Europe * 176 Colour Pages * 1000 Photographs * 1400 Products * Technical Specifications * News Snippets

Now established as the foremost equipment guide this edition is completely new with every page in full colour and almost every item illustrated. For the cost of a magazine you can get the best of the best.

£2.95 plus £1 postage

Kachina 505DSP HF Transceiver
A complete PC controlled remote HF rig - In stock

Main Features
- 100W HF All bands + Receive 100kHz - 30MHz
- Filters for SSB 3.5, 2.7, 2.4, 2.1kHz
- Filters for CW 1kHz, 500Hz, 200Hz, 100Hz
- Band Scope, DSP filter, Memory keyer, log book, VSWR meter, Smith Chart, pre-amp, 20dB attenuator, plus many software controlled functions.

£1995

SGC-2020 QRP HF Transceiver
Limited Stock

1.8 - 30MHz 0 - 20 Watts SSB and CW with full break-in. Can run from 12 volts or internal pack. Delivery expected at the end of March

£599

VHF & UHF Band Pass Filters

2m & 70cm

NO MORE PAGER PROBLEMS

We guarantee W310111 ad ORM Caused by strong out of band signals - or your money back!

IX1-145 £89.95
Passbend: 144 - 146MHz
Power: 200 Watts

DGI-145 Passband: 144 - 146MHz
Loss: Less than 1 dB
Selectivity: -50dB at 13MHz -55dB at 150MHz
Power: 200 Watts

DGI-895 Passband: 430 - 440MHz
Loss: Less than 1 dB
Selectivity: -47dB at 150kHz -50dB at 455kHz
Power: 200 Watts

NEW PC controlled remote HF rig - In stock

Check your base or handheld transceiver, or hunt out frequencies of nearby transmitters or handhelds. The "hold" button lets you lock on and store the frequency.

UK's Top Dealer for YAESU, KENWOOD & ICOM
ICOM 7461-8 - 144MHz

Includes 70MHz Transceive

100W 1.8 - 50MHz* 50W 2m/70cm* SSB - CW - FM - AM * CTCSS * Alphanumeric * 1.25KHz steps * Packet ready 1200 & 9600 * DSP filtering * Dual display * squelch * IF shift * notch filter * Power control * Tx monitor * Electronic keyer * 12.5 / 25KHz switched FM filtering * Switchable pre-amp * Size 260 x 86 x 270mm * weight 7Kg

Phone

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YAESU

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EXCLUSIVE 10 DAY APPROVAL - On All Mail Order Sales

0 11400, W0411 £1595 1.8MHz to 432MHz Plus FREE PSU & Base Mic

Includes 70MHz Transceive

100W 1.8 - 50MHz* 50W 2m/70cm* SSB - CW - FM - AM * CTCSS * Alphanumeric * 1.25KHz steps * Packet ready 1200 & 9600 * DSP filtering * Dual display * squelch * IF shift * notch filter * Power control * Tx monitor * Electronic keyer * 12.5 / 25KHz switched FM filtering * Switchable pre-amp * Size 260 x 86 x 270mm * weight 7Kg

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Includes 70MHz Transceive

100W 1.8 - 50MHz* 50W 2m/70cm* SSB - CW - FM - AM * CTCSS * Alphanumeric * 1.25KHz steps * Packet ready 1200 & 9600 * DSP filtering * Dual display * squelch * IF shift * notch filter * Power control * Tx monitor * Electronic keyer * 12.5 / 25KHz switched FM filtering * Switchable pre-amp * Size 260 x 86 x 270mm * weight 7Kg

DX-7T

Limited Stock

Special Price

Save £50!
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RADIO BASES
Rob G3XFD continues with his series by describing an integrated circuit audio amplifier.

WHAT IS IT?
Ian Poole G3YWA sets out to answer the question 'What is a Gunn Diode?'

AIR TATTOO COMPETITION
Your chance to win tickets to the 1998 Royal International Air Tattoo.

ELECTRONICS IN ACTION
Tex Swann G1TEX brings together four pages of electronics hints, tips, news and reviews.

TOP BAND TOURER - REVISITED
John Hoban G3EGC has come up with some interesting modifications to a popular 1.8MHz a.m. transmitter-receiver project first published in 1994.

MOBILE WORKING!
Keen mobile operator Richard Newton GORSN puts the new Kenwood TM-G707E dual-band mobile transceiver to the test.

THE 16TH ANNUAL PRACTICAL 144MHz QRP CONTEST RULES
Neill Taylor G4HLX reminds us that it's time to get ready for the PV 144MHz QRP Contest.

THE GDP-430 HAND-HELD UHF TRANSCEIVER - PART 3
Geoff Pike G1OLGDP describes the final constructional stages of his low power hand-held transceiver project.

ANTENNA WORKSHOP
Gerald Stanley G3MCK asks the question 'Is that coax any use?'

CARRYING ON THE PRACTICAL WAY
Find out why George Dobbs G3J0V says an 'audio brick will do the trick'.

VALVE & VINTAGE
Phil Cadman G4GJP takes a look at the work of F.G. Rayer G3OGR - one of PW's most prolific authors from the past.

KEYLINES

LETTERS

NEWS

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SUBSCRIPTIONS

RADIO DIARY

BOOK PROFILES

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BOOK STORE

COMING NEXT MONTH

Regular reports from across the bands and this month we welcome Chris Edmondson VK3CE to our team of reporters.
ALINCO
GIVES YOU
more FOR LESS!

DX-70TH
100W HF Transceiver plus 100W on 6 mtrs

The DX70 TH packs a hefty 100W punch on all Ham bands 1.8 - 50MHz. It is backed by a superb receiver with narrow filters fitted as standard. Make no mistake - this is a real DX operators transceiver ideal for use at home, in the car, or for that portable DXpedition. General coverage receive is included and wideband transmit facilities for export customers. The detachable front panel allows remote mounting and additional security.

- TX: all HF + 6mtrs
- RX: general coverage 150kHz - 30MHz
- 50MHz: 1.5MHz
- SSB, CW, AM, FM and digital modes
- 100 memories
- Detachable facia plate and remote mounting kit available
- Speech processor standard
- Narrow filters fitted as standard
- 100W output on HF & 6mtrs
- Selectable 4 stage RF gain -20dB to +10dB
- Superb TX audio and RX
- Excellent RX sensitivity
- Full break in on CW
- Time out timer setting
- AM Airband RX
- Optional extended receive inc airband
- VHF 108 - 174MHz
- UHF 420 - 470MHz

A brilliant twin band handheld that does everything including spectrum display of adjacent channels. The RX has a superb front end that does not suffer with breakthrough like some other handhelds. It has CT/CSS/DTMF built in as standard.

- 120 memories
- VHF 50W/UHF 35W max
- Channel Scope
- Full duplex
- CTCSS encoder
- AM Airband RX
- Optional extended receive inc airband
- VHF 108 - 174MHz
- UHF 420 - 470MHz

Simple to operate, easy to program and dependable to use. It has optional extended receive coverage for airband, business and marine radio.

- Optional receive to cover Airband, PMR, Marine, UHF, etc 135-950MHz (with glows)
- 100 memories
- Channel Scope
- simultaneously displays 7 channels
- 9000 BPS Interface
- CTCSS encoder
- Time Out Timer
- On air cloning
- 120 memories
- CTCSS encoder
- Full duplex
- Optional receive to cover Airband, PMR & Marine 118-135.995MHz (AM) 136-173.995MHz (FM)
- 51 memories
- Time out timer setting
- Alpha numeric display
- 50W FM output
- Electronic squelch
- c/w DTMF m/c

A full featured 50W 144MHz FM mobile radio that's crammed full of extras. The DR-150 takes mobile radios into the 21st century!

- Optional receive to cover Airband, PMR & Marine 118-135.995MHz (AM) 136-173.995MHz (FM)
- 51 memories
- Time out timer setting
- Alpha numeric display
- 50W FM output
- Electronic squelch
c/w DTMF m/c

Easy to use twin band mobile TX that delivers both high power and performance with user friendly features.

- 50W (2m) - 35W (70cms)
- 100 memories
- Full Duplex
- CTCSS encoder fitted

With the new 6 metre repeaters now up and running, this is the ideal radio for the Band. With an optimised receive front end, CTCSS encode and easy to use controls you will be amazed at the range achievable.

- 100 Memories
- Programmable Repeat/Shift

The DX-605E dual band transceiver equipped with Alinco’s Advanced Channel Scope utilises a ‘Real Time Monitor’ on 11 different frequencies simultaneously giving you quick visual scanning capability and the potential for making numerous contacts.

- Optional receive to cover Airband, PMR & Marine 118-135.995MHz (AM) 136-173.995MHz (FM)
- 40 memories
- CTCSS encoder
- Full duplex
- CTCSS encoder fitted

The EDX-1 is a coasial tuner with built in Power and SWR meters. The ATU is rated at 120W and covers 160-10 meters including WARC bands.

- Quick/shift matches random wire antennas, mobile whips, verticals, inverted Ls, Wired for DX70 but can be used with most HF Transceivers.
- 1.6MHz - 30MHz
- 200W PEP

The DR-M06TH 6mtr FM Mobile 50 - 54MHz is packed full of extras. The DR-M06TH takes mobile radio to a whole new level. It is simple to operate, easy to program and dependable to use. It has optional extended receive coverage for airband, business and marine radio.

- Optional receive to cover Airband, PMR & Marine 118-135.995MHz (AM) 136-173.995MHz (FM)
- 40 memories
- CTCSS encoder
- Full duplex
- CTCSS encoder fitted

- Programmable Repeat/Shift

MICRO SIZED Handhelds

- Covers all HF Antenna Bands
- General coverage receive (150kHz - 30MHz)
- 100 memories
- 10W, SSB, CW & FM, 40W AM
- Built in speech compressor
- Computer control with optional EBP-36N
- Full QSK in CW modes
- QRM/QRN reduction with IF shift, RF attenuator and optional CW filter
- Two Vfos + memory operation mode
- Basic model upgradable to (T) model with EJ31U Electronic keyer .......£29.95
- EJ34U CTCSS .........£39.95
- EJ35U CW filter .........£49.95
- Pest and Peeling £2.75

The EDX-1 is a coasial tuner with built in Power and SWR meters. The ATU is rated at 120W and covers 160-10 meters including WARC bands.

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- 1.6MHz - 30MHz
- 200W PEP

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- 1.6MHz - 30MHz
- 200W PEP

With the new 6 metre repeaters now up and running, this is the ideal radio for the Band. With an optimised receive front end, CTCSS encode and easy to use controls you will be amazed at the range achievable.

- 100 Memories
- Programmable Repeat/Shift

EDX-1 HF Antenna Tuner

EDX-2 Auto Random Wire Antenna Tunner

Quickly matches random wire antennas, mobile whips, verticals, inverted Ls. Wired for DX70 but can be used with most HF Transceivers.

- 1.6MHz - 30MHz
- 200W PEP

HFM-1 HF stainless steel mobile antennas c/w spring base.

Covers: 3.5 - 30MHz

When used with EDX-2 auto ATU Length: 2.7 metres
The new Alinco DJ-C5E is so slim that it will hide in a shirt pocket and yet it has the power to work repeaters miles away. Clear, clean audio, 40 memory channels plus two call channels, one per band and a lithium ion battery that can be charged hundreds of times without memory effect.

- 40 memory channels plus one Call channel per band, each memory capable of non-standard splits
- CTCSS encode plus tone burst
- 300mW output
- Large capacity internal 500mAh lithium ion battery
- Earphone/mic port
- Built-in loudspeaker
- Includes snap-in battery charger
- Fast 2 hour charging time
- 56(W) x 94(H) x 10.6(D)mm (without projections)
- Weight only 80g

ALINCO DJ-C5E

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**ACCESSORIES**
- Soft case
- Earphone
- Two hour charger
- Rechargeable Lithium-ion battery
- Flexible whip antenna
- Speaker Mic EMS-49

ALINCO EMS-49
Speaker Mic
Miniature speaker mic with lapel clip for use with DJ-C5E

**£189.95**

**£22.95**

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Choice of the top DXer’s

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**FOR A FINANCE EXAMPLE, PLEASE SEE OPPOSITE PAGE**

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**YEASU FT-847**  
The ultimate HF transceiver.  
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**YAESU FT-920**  
Despite competition from Icom & Kenwood, the 920 clearly remains our most popular transceiver ever sold. Full HF + 6m coverage. Now supplied with AM & FM.  
OUR PRICE £1249.00  
or 36 mths @ £40.79

**YAESU FT-840**  
OUR SPECIAL PRICE £829.00  
or 36 mths @ £30.54

**ICOM IC-207H**  
Dual band transceiver. Detachable front panel, 50W on 2m, 35W on 70cm. Super wide band receiver with AM, FM, SSB.  
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**ICOM IC-746**  
Latest HF + 6 + 2m transceiver. Extremely high spec and great value for money at £1395.00.  
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**ICOM IC-207H**  
Dual band transceiver. Detachable front panel, 50W on 2m & 35W on 70cm. Super wide band receiver with AM, FM, SSB.  
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Practical Wireless, June 1998
SALES HOTLINE 01480 406770

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* GUARANTEED TOP PRICES PAID

ALINCO

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Interesting HF transceiver. Great Alinco quality.
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NEW

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RECEIVERS

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ICOM IC-R8500
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Fantastic value for money. AM/FM switchable.
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Practical Wireless, June 1998
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£349.00

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DR-M06T
£249.00

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WE NOW UNDERTAKE REPAIRS, MODS, SERVICING ALL WORK WARRANTED.
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SECONDHAND EQUIPMENT

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£1495

TS-870S DSP transceiver
£1500

TS-711E base 2 multi mode transceiver
£490

TS-855E transceiver
£825

TM-251E 2m 50W...
£230

TL-922 HF amp 1/2W
£999

TS-446AT with filter...
£699

TS-970E dual band base
£998

FT-H700 HF transceiver
£199

FT-900 AC transceiver (2 only)
£1050

FT-747 transceiver HF...
£350

FT-737 transceiver VHF...
£100

Adams DX-10 new mobile HF mic
£40

Cushcraft Ten 3-element 10 meter as new
£100

FT-755R 2m/6m/70cm.
£960

Yaesu

FT-8500
£3550

FT-980
£350

FT-726R 2/6/70 base
£650

MD-1 mic
£75

FC-107 antenna tuner
£195

FT-4800 late receiver converter.
£195

FT-990 AC transceiver (2 only)
£1050

IC-706 MkII
£725

R-72 receiver
£400

FT-777 AT (second).
£180

Adams DX-10 new mobile HF mic
£40

FT-1000D mini
£1800

IC-706 MkII
£600

IC-726 HF50MHz
£550

IC-W31 dualband Inc dual receiver. New
£240

12 months warranty

IC-500 new dualband
£199

FT-990 AC transceiver (2 only)
£1050

IC-706 MkII
£725

AT-500
£230

Warranty on all secondhand equipment. Telephone for an up to date list
01922 414796 (Commission sale taken)
Everyone on the PW Editorial team is very approachable, whether it be during a show, rally or during office hours. Many of you take the opportunity to chat to us whenever possible and it's possible to telephone any of us at the office, including myself, at any time.

Anyone telephoning and asking for me is immediately put through, as we don't have 'layers' of staff to penetrate before you get through to anyone of us on the team. One of the benefits of being a member of a small team! We're always pleased to help, and of course E-mail is now playing an increasing part in daily communications.

Many readers now E-mail me and get a 'zippy' reply usually within the working day. That's fine - if you don't mind a hurried keyboard reply without the benefit of 'spell checking' for the inevitable 'typos' caused by my ill-educated artificial arm's typing appliance! (The National Health Service has promised me a new typing gadget that can spell - and I hope it arrives soon!).

However, although I enjoy talking to readers, and practice what I preach by avoiding the "Particulars Withheld" entry in the RSGB's Callbook, I'm receiving an increasing number of telephone enquiries at home. And to date, the latest (or earliest?) I've received a call was 2am...from an Australian reader enquiring about an equipment review. He was easy to forgive because he'd totally forgotten the time difference between Queensland and Dorset times!

Out Of Hours
Over the years I've received many telephone calls 'out of hours' from readers - but I'm determined to keep the 'open approach' by remaining in the Callbook and telephone directory. But in return I ask you to bear in mind several things before you do call.

Firstly, please think carefully about what you are to ask me! For example, if you're enquiring about an article, or review in the magazine bear in mind that unlike the office - I won't have all my magazine reference copies to hand and that 'Archive Specialist' Tex Swann G1TEX won't be available!

So I would be pleased if you reserved any telephone calls you make to me at home to be for purely personal matters. Those I can deal with at home!

I also ask you to do the same for letters. If you're writing a purely personal letter - please feel free to address it to me at home. However, if your letter has any connection with PW or with me as Editor - please send it to the office where it will be much safer (logged in and recorded) than it would be in my rather disorganised office at home!

While on the subject of letters received at home, could the reader (from the Portsmouth area I believe) who sent me a cassette recording containing QSOs from the early hours on 3.5MHz, direct to my home please write to me again. This time addressing your letter to the offices - as I've mislaid the original.

Finally on my 'open approach' I should like to apologise to those callers who have got me out of my bath or bed - and who have not spoken to the 'usual tempered' G3XF. However, on these occasions when I've dried myself off and thought perhaps I'd been a little unfriendly - I've tried to call them back via the "1471" telephone dial-back facility.

Unfortunately my recall efforts don't work very often because most of the late night callers are invariably 'numbers withheld'... and I can't call them back. So it appears that the open approach is definitely only a 'one way' street in some cases!

Rob Mannion G3FXD
Garmin GPS - Battery Life

Dear Sir

I read with interest David Butler's review of the Garmin GPS III (PW March 1998) as I purchased the same model some four months ago. Like your reviewer, I never cease to be impressed by its performance - but like David, I was also initially very disappointed by the fairly short battery life.

The 700mAh NiCd cells provided a paltry 2.5 hours use before the 'low battery' warning indicator appeared, while the high cost of alkaline cells preclude their consideration as a serious long term option. The answer was to spend £10 at a rally on a set of AA size NiMH cells. These, when fully charged, will run the GPS for up to six hours continuously (less if the backlight is used).

They also have the advantage, that due to their lack of 'memory effect' their charge can be 'topped-up' as and when necessary. I hope that this information will be of interest to anyone considering the purchase of the Garmin GPSIII.

Andrew Dormont G88GT
Berkshire

First Morse QSO

Dear Sir

Reading the letter from Dave Skye G3PLH in the April issue of PW caused me to recall a similar experience when I first ventured onto the h.f. bands using c.w. Having studied for the 'plain text and numbers' Morse test, I finally passed the exam in January 1988.

I was extremely lucky in so much as my Morse teacher offered to continue my tuition, after passing my exam, so that I could learn the art of 'on air' c.w. operation. I readily agreed to this additional tuition and noted how very different this style of Morse was to that which I had already learnt.

Armed with this new knowledge and the assurance that "good c.w. operators could, and usually would, adjust their speed to suit that of the station calling", I went on air. I put out a CQ call on 7MHz and received a reply from a Q4 'machine gun Morse merchant' who, to my surprise, went immediately into his first QSO with a member of the FISTS CW Club. He not only stuck with me for a while, but also instantly slowed down to my speed without having to be asked.

This, in itself, gave me the confidence boost I needed and I have now returned almost entirely to c.w. I have also joined the FISTS CW Club and worked many like minded operators who are more concerned with the quality of their Morse than the speed they can send it at.

They do their utmost to welcome new c.w. operators to the world of Morse Code. In my opinion, this organisation proves that a c.w. QSO need not be a battle of wits but can be a pleasurable way to enjoy another means of communications in this vast hobby of ours.

Chris Carrington GO1YZ
Derby

Morse & The 'A' Licence

Dear Sir

Views from one extreme to the other have been expressed in various publications, over the last couple of years in particular, on the subject of the 'A' licence requirement for a pass in the Morse test.

I think it's so obvious that the majority of those in favour of keeping the requirement, including the RSGB, only want to keep it as a tool for limiting the number of operators on the already overcrowded bands, in particular those coming from the 11m/CB avenue. It's also just as obvious that those opposed to keeping the requirement just can't be bothered to learn a simple code that even children have managed to learn at very young ages.

I was very lucky in that I was taught Morse code (1987) at speeds of up to 50w.p.m. while in the Royal Signals, by a great character called Charlie Edgar. I wonder whether any older ex RS readers might recall him from earlier years? These speeds were attained over
Wynn's One Valver

Dear Sir

Ever responsive to the 'call' from the Editorial 'throne' of our favourite magazine, here a few lines and a photo of the little 0-V-W that got built a few years ago, to show what one valve would Do... but not cheap! - safe h.t. using conveniently charged via a 'fairy light' bulb and gating diode from the shack's 12V supply) a slot was incorporated below the 'breadboard' to house a 'domino-stacked' set of PP3 batteries. The half dozen members too! may well attract more readers interested in the project. I think that there's a possibility of a new edition of PW, the mains are 50Hz as you say, but 50 positive and 50 negative pulses do not make 100Hz from the tip of a soldering iron because you need one +ve pulse and one -ve pulse for 1Hz, therefore at the tip of the iron is a 50Hz mains hum and not 100Hz.

Wales

Lisle Street

Dear Sir

Remember Lisle Street? Memories of long ago, of constructing sets featured in PW were brought back on reading the letter 'It's a small world' by John Taylor G3OHV in the October 1997 issue. Also interesting were the Editor's comments about Lisle Street in the May 1998 issue, where we home constructors bought our components, valves and ex-government gear from the many radio shops, all interspersed with steep stairways leading to entirely different pleasures above!

One particular instance which sticks in my memory was when I had my new set pressed against the glass of a radio shop and a small very young sailor strolled by. A tall voluptuous lady standing at the bottom of a stairway put out an arm and grabbed the lad and he was whisked upstairs before you could bat an eyelid...

Things have changed ever since, and when I looked up Lisle Street a short while ago, it was all Chinese take away's and offices, not a radio emporium left from those 'good old days'.

Douglas Byrne G3KPO
Isle of Wight
Hi-Tech Manuals

Mauritron Technical Services are a major supplier, in the UK, of Service Manuals for all types of equipment ranging from the earliest valve sets to the latest video recorders, etc. They have been supplying manuals to the electronics repair trade since 1988 and have just launched a series of CD-ROMs containing their technical manuals as compilations.

Each CD-ROM contains 25 service manuals covering a wide range of equipment. The CD-ROMs which are currently available contain manuals for Television, Video Recorders, Computer Monitors and Vintage Valve Wireless sets. Future editions will cover Test equipment, Amateur Radio equipment and Office equipment to name a few.

Mauritron say that once you’ve used the CD method of obtaining servicing information you’ll wonder how you managed before! Each CD costs £24.95 plus VAT and are available from Mauritron at 8 Cherry Tree Road, Chinnor, Oxfordshire OX9 4QY. Tel: (01844) 351694, FAX: (01844) 352554 or E-mail: enquiries@mauritron.co.uk. If you’ve Internet access you can find details of the latest editions and current special offers on the Mauritron Web site at http://www.mauritron.co.uk/mauritron/

A full catalogue detailing all the makes and models covered by the CD-ROM series and the range of technical publications is available on a floppy disk to receive yours, just send two first class stamps to Mauritron. If you want printed copies of the manuals they are still available.

More Minatures!

Do you remember the Alinco DJ-C1 (144MHz) and DJ-C4 (430MHz) hand-helds which were reviewed in the September 1997 issue of Practical Wireless? Well now there’s a dual-band version available.

The latest ‘super slim credit card’ sized radio is the DJ-C5E and like its single band stable mates is small enough to hide in a shirt pocket! The DJ-C5E features 50 memory channels plus one call channel per band, CTCSS encode plus tone burst, 300mW of output power and a large capacity internal 800mAh lithium-ion battery.

Weighing in at only 80g and measuring just 56 x 94 x 10.6mm the DJ-C5E is light and slim, but, the manufacturer’s state... it’s powerful enough to deliver clear clean audio. And that’s not all the recommended price is just £189.95!

To find out more about the DJ-C5E contact Nevada at 189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626.

Casio Catch

If you travel away from home a lot and tend to miss out on your favourite television programmes then the new Casio JY10 could be just what you’ve been looking for! The JY10 is a portable television with a 2.3in colour L.C.D. screen giving, the manufacturers claim, excellent picture quality.

Styled in yellow, the JY10 features an earphone jack, which allows you to listen in private while watching and an audio video jack also has an instant playback of home-made videos - ideal for those

Radio Basics

If you’ve been following Rob Mannion G3XFD’s ‘Radio Basics’ series over the last few months in PW don’t forget to send in for your free Radio Basics Information Sheets. Editions 1 and 2 are currently available from the Editorial offices upon receipt of a large stamped addressed envelope. In addition to this, if you’d like reprints of Rob’s original ‘Getting Started the Practical Way’, 5-part series first published in 1986 please enclose a cheque (payable to PW Publishing Ltd) or Postal Order for £2.50 with your request.
Decoding & Analysing

It's generally an accepted fact that many radio enthusiasts are also avid PC users. And by using the new Wavecom W41PC card you can now enjoy both radio and computing side-by-side.

The Wavecom W41PC boasts dual digital signal processors capable of handling more than 64 million instructions per second along with 4MB of on-board memory and a well tested software package. To set-up your computer for use with the W41PC all you have to do is run a Windows based software program which has been developed by Wavecom Elektronik AG. The current software revision allows decoding of 70 modes across the h.f., v.h.f., u.h.f. and s.h.f. bands and when used in connection with the SHOC Radio Manager and the Klingenfuss Verlag database the user has access to an almost unlimited range of PC scanning options.

It's possible to fit a total of four W41PC cards into one PC, which ensures concurrent monitoring of up to four data transmissions at any one time. For more details and price information contact Sight Systems Ltd., Wavecom Sales & Marketing, Woods Way, Worthing, West Sussex BN12 4OY. Tel: (01903) 242001. Additionally for a full product portfolio point your web browser at: www.sightsystems.mcmail.com

Battery life is around four hours and optional extras which are available include a car adaptor and an a.c. adaptor.

The price of the Casio JY10 is around the £99 mark, however there are five models in the range with prices ranging from £89 to £330. If you're interested in getting hold of your own portable television check out your local Argos, Dixons, Tandy and Tempo stores.

50 Years Of Computing

June 21 1948 saw the birth of the first stored-program electronic digital computer, at the University of Manchester. The machine had the ability to store and run any program put in by a user, which set it apart from all other special purpose computing machines and highlighting it as the first computer.

To commemorate the landmark of scientific research, a large number of activities will take place in Manchester during June of this year. Events will include the commissioning of an exact replica of the Manchester Mark 1 computer, public lectures, and 11 scientific conferences all of which will be held at the University of Manchester.

A Special Event Station will go on air on 7 June 1998 until the end of the month, using the callsign GB50MKI (50 years Mark 1) to mark the celebrations. The GB50MKI station will transmit on all short wave bands above 1.8MHz, using s.s.b., c.w. and f.m. but focusing in particular on data modes. Via a BBS operating on v.h.f., information about local events as well as technical information regarding the Manchester Mark 1 computer will be accessible 24 hours a day.

Special QSL cards will be issued for contacts with GB50MKI, and the transmission schedule of GB50MKI will be published in advance on the World-Wide Web. Point your browser at: http://www.gb50mki.org/

For more information the GB50MKI celebrations contact either Simon Kahn GOSTU via E-mail at: simon.kahn@ic.ac.uk or Michael Lancaster G7VVZ on Tel: 0161-275 6083, FAX: 0161 275 6040 or E-mail: M.Lancaster@mcc.ac.uk Up-to-date information about all events can be found at http://www.computer50.org/index.hml and more detailed information about the world's first stored-program computer can be found at http://www.computer50.org/ #mark1

The 1998 Young Amateur Of The Year Award (YAOTYA) has recently been announced by the Radiocommunications Agency in conjunction with the Radio Society of Great Britain. The annual award, which is given for the most outstanding achievement by a young Amateur Radio enthusiast, is open to anyone under 18 with an interest in radio (candidates do not have to be licence holders).

The following areas of activity will be taken into account when applications are assessed:

* d.i.y. radio construction
* Operation of radio
* Community service
* Encouraging others
* School projects

The idea behind the award is to generate interest in Amateur Radio and to encourage more people to become actively involved.

Applications for the YAOTYA award should be sent to Radio Society of Great Britain, Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JE and must received by 31 July 1998. The award is open to any resident of the UK, Channel Islands or the Isle of Man and entrants must be nominated by an adult sponsor.

The winner of the award will be presented with their £300 prize together with other radio 'goodies' at the RSGB's HF Convention in September 1998.
Library Display Success

The Cockenzie & Port Seton Amateur Radio Club’s local library has two display cabinets, displaying various activities and items of interest on a regular basis. These displays normally run from four to six weeks.

When one display was finished the club were undecided as to what to show next when Liz Clark (2M1GLD who works in the library, came up with an idea. Why not put on a display telling the local people all about the Radio Club and Amateur Radio in general?

Secretary Bob Glasgow (GM4UYZ then received a ‘phone call from Claire Johnston, the Head Librarian. She was officially asking if the Radio Club was interested, of course, was the answer!

The display was duly set-up and was in the library for six weeks before receiving a request from the librarian at Haddington Library asking if it could be moved there, which it now has.

According to Claire and Liz, the display, whilst in the library, definitely attracted a fair amount of interest. But whether it has induced people to take it further, well, time will no doubt tell.

So, how about approaching your own local library and ask if something similar could be done? It’s definitely a cheap and effective way to promote Amateur Radio to the masses. Even if you only bring on one person into the hobby, the exercise has done its job!

Finally, the Cockenzie & Port Seton Amateur Radio Club are holding their 144MHz d.f. hunt on Friday May 15th 1998. The meeting place will be the car park near the old Pond Hall site in Port Seton at 1900. The first transmission will be on static display - from a Tiger Moth to a Tornado, representing RAF Kemble’s involvement over the years. The Red Arrows will take part in the ever popular Red 11 on static display.

In conjunction with the Air Show organisers’, members of the Trowbridge & District Amateur Radio Club will operate the station, which is located in the Bristol Aero Collection Museum. Planned operation will be primarily on 80/40 (3.5/7MHz) and 2m (144MHz) with a possibility of 6m (50MHz) as well.

For further information about the Air Show telephone the information line on (0891) 122900 (calls 50p a min.) or E-mail http://www.notar.force9.co.uk/kkad98.html For GB5MU, telephone Ian Carter G0GRI on (01225) 864698 evenings and weekends. QSL cards available and to be direct to G0GRI with an s.a.e. or via the Bureau.

Nunsfield House ARG

For more than 30 years, the Nunsfield House Amateur Radio Group has been a prominent organisation within the amateur radio community of Derby and its surrounding area. The Group is affiliated to the RSGB and is a section of the Nunsfield House Community Association. The HQ and shack are located in the Association’s main building, which is just off Boulton Lane in the Alvaston area of Derby.

Having more than 60 members, the Group has an extremely active programme of events throughout the year, encouraging as much membership participation as possible. As well as having ‘in-house’ events such as talks, video presentations, home-brew competitions, etc., the Group also has a programme of external events such as minibus trips to rallies, attending local lectures, quiz nights, etc.

As an approved City & Guilds Novice licence examination centre, the Group organises regular Novice Licence courses which are instructed by Frank Whitehead G44MLL who is the Senior Instructor for the Derby area. The current course has 17 students attending regularly on a Saturday morning. The next course begins in September, and details can be obtained from Frank on (01332) 512080.

The Group is also responsible for organising the Elvaston Castle National Radio Rally, held this year on Sunday 14th June. Further details about the Rally from Brian Reid, Rally Secretary, on (01332) 791412.

The Group meet each Friday at 7.30pm for the programmed events and a less formal get together takes place on a Monday evening. Visitors and new members are always welcome on either evening. The Group is often also on the air, so keep a look out for G3ZBI, G3EEO, GONHR or G8KGCC.

For more information about the Group and activities, contact Bill Smith G7PJ,J, Hon. Sec. on (01332) 573174, details are
New & Improved Venue

The Barry Amateur Radio Society Radio & Computer Fair has changed its venue for February 21st 1999. The new and improved venue will be held at the Holmview Leisure Centre, Skomer Road, Barry.

There will be a lounge bar, catering and parking. Admission is £1.50 and doors open at 10am for disabled visitors and 10.30am for the general public. More information from Brian GWOPUP on (01222) 832253 (combined telephone and FAX number).

Warrington’s New Antenna

The Warrington Amateur Radio Club now have a new antenna, a Force 12 beam for 7, 14, 21 & 28MHz, installed on its wind-up mast controlled from within the shack. The trials and tribulations in getting planning approval for this replacement to their previous beam and mast have taken some nine months!

So now the club have a first class facility for h.f. working available to club members at all times. In the past year, the club have also equipped themselves with further items of test gear and can now offer their members the option of having their rigs checked and tested to professional standards!

The Warrington Amateur Radio Club meet at 8pm at the Grappenhall Community Centre, Grappenhall, Warrington. On June 9th, there is a talk by Peter Kirby, General Manager of the RSGB. If you would like further information about the club’s activities, then contact John Riley, Club Secretary, on (01925) 762722.

New Group

Club Spotlight have recently heard about a new group in town! The Stockton-On-Tees Special Events Group G3YNB. The Group run four to six events each year connected with Stockton, such as Captain Cook, the replica of the Barque HMS Endeavour (GB0CBB), Stockton & Darlington Railway, Stockton Riverside Festival GB0SRF and the Billingham Folklore Festival.

More information about the Group is available on their website world.compuserve.com/hom epages/mikeg0dod

Silent Key

Derek Purchase G3LXP died early on the morning of the 9th March 1998, only 36 hours after his round, happy smiling face had been seen wandering through the London Amateur Radio Show at Picketts Lock. Derek Purchase was a founding member of the Verulam Amateur Radio Club (VARC) and was probably its longest serving committee member. He was a great motivator, either organising or cajoling others to set up stations for NFD or VHF NFD and JOTA, as well as the myriad of tasks necessary in a club.

Derek never lost his enthusiasm for his hobby, VARC and his support of young people in Amateur Radio. He leaves a devoted wife Susan and his children Jennifer, Nigel and Robln, to whom we extend our sincere sympathies.

New Committee

Back on the 28th March, the Ynys Mon Radio Users Group had their 2nd Annual General Meeting and the new Committee voted in are as follows:

Co-ordinator Paul MW1CAN
Co-ordinator Gwynfor MW1CGZ
Secretary Tom GW0EGF
Treasurer Bill MW0BLU

The Group wished the Committee all the best of luck in their new posts and thanked the old Committee for all their tireless efforts in putting the Group on such a solid basis, with so much achieved in such a short time. The new Committee has already stated that they have some ideas for the coming year, with many events, talks and outings.

The Group meet at the Scout Hall, Llangefni, opposite Kwik Save, every 2nd and 4th Wednesday of each month at 7.30 till 10pm, where events are run throughout the year. All are welcome, so why not go along. There are refreshments available on the premises and a 50p entrance fee.

For more information about the Group, contact Tom Burley GW0EGF, 43 Maes Bleddyn, Llanllechid, Gwynedd LL57 3EG, Tel: (01248) 602887.
Wrong Way Up

You'll see that the project is built the 'wrong way up' with the i.c. and components on the copper track side of the Veroboard. This is a deliberate choice as the technique is much easier for the inexperienced constructor to use as everything is on the same side.

However, this method does not stop you from using wire links on the opposite sides of the board if you wish. It also provides an introduction to my favourite method of designing p.c.b.s, using them undrilled and mounting the components on the track side rather than on the opposite side. I shall be introducing you to this technique very soon!

I strongly recommend you use an i.c. socket for the LM386, it can be mounted very easily directly onto the matrix board copper tracks and soldered directly to them using the soldering lugs - after you've bent them out at right angles. Once you've soldered one, it's an easy job to solder the others and keep the socket correctly on the tracks.

Checking Connections

When you've finished building the project, check all the connections by comparing them with Figs. 1 & 2, and also checking polarity of the electrolytic capacitors. Finally, insert the LM386, making sure it's placed in the same way as indicated in the drawing.

With a 9V supply connected a loud mains 'hum' should be heard when you apply the tip of a plugged-in soldering iron is applied to the audio input. The hum level should vary as you adjust R1. If it doesn't recheck your connections and try again!

The diagram, Fig. 3, shows the modification needed to connect the original receiver to the amplifier. The headphones are replaced by a 2.7kΩ resistor to act as a 'load'. I chose this value to provide the best output level, and the signal is fed to the amplifier input via the 0.1μF capacitor.

With the modifications, the resultant audio output is impressive indeed and very loud once you have connected the amplifier and the receiver together. In fact while tuned into BBC Radio 4 on 198kHz I fed the audio into an 8Ω hi-fi speaker and the quality was so good I sat and enjoyed listening to 'Book At Bedtime'!

Have fun building this amplifier, it will come in useful for future projects. You can also use it as a 'Baby Alarm', and as a basis for intercoms, etc. (Further ideas will be included in Information Sheet 2).

This month Rob Mannion G3XFD describes a simple and useful integrated circuit audio amplifier which will form part of future projects in 'Radio Basics'.
## Practical Wireless, June 1998

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This time Ian Poole G3YWX sets out to answer the question What is...A Gunn Diode?

Gunn diodes are used as an easy and relatively cheap method of producing low power microwave signals. Operating at frequencies between a few Gigahertz to over 100GHz they have been available for many years. These days they are well established and are used in a variety of applications and they are particularly popular for the 10GHz amateur band.

Construction
A Gunn diode is made from a single piece of n-type silicon. This consists of three main areas shown in Fig. 1. The areas at the top and bottom of the device are heavily doped to give n+ material, giving high conductivity for connection to the outside world. The device is mounted on a conducting base to which a wire connection is made. It also acts as a heat-sink to dissipate the heat which is generated.

The connection to the other terminal of the diode is made via a gold connection deposited onto the top surface. Gold is required because of its relative stability and high conductivity.

The centre area is the active region of the device and this is less heavily doped giving it lower conductivity. Typically this is about 0.5S2 per cubic centimetre and it means that virtually all the voltage placed across the device appears across this layer in the diode.

Usually the active layer of the diode is about ten microns. As this largely determines the approximate frequency of operation its thickness will naturally vary from one device to another. This also means that part of the specification for a device is its operating frequency.

In view of the fact that the Gunn diode consists only of n-type material there is no p-n junction in the device. In fact, it is not actually a true diode and it operates on totally different principles.

Operation
Although the operation of a Gunn diode can become complicated, it can be viewed from a basic level. When a voltage is placed across the device most of this appears across the active region. This is very thin and even a modest voltage means that the potential gradient, or voltage change over a given distance is very large.

When the voltage across the active region reaches a certain point a current pulse starts to travel across the active region as shown in Fig. 2. When this occurs the potential gradient across the rest of the active region falls, preventing any more current pulses from being generated. Only when the current pulse reaches the other side of the active region does the high potential gradient return, and another current pulse can be generated.

The unusual current pulse action can be viewed in a different way if the curve for the voltage and current is plotted out. The diagram Fig. 3 shows the curves of a normal diode and a Gunn diode.

For a normal diode the current increases with voltage, although the relationship is not linear. On the other hand the current for a Gunn diode starts to increase, and once a certain voltage has been reached, it starts to fall before rising again. The region where it falls is known as a negative resistance region, and this is the reason why it oscillates.

Frequency Set
Although the approximate frequency of operation is set by the thickness of the active region, it's still possible to vary the frequency over a limited range, so many devices the Gunn diode is normally fitted into a waveguide cavity which forms a tuned circuit, and this is the resonant frequency of the whole assembly which governs the frequency of operation.

Tuning can be carried out in a number of ways. Mechanical adjustments can be made by placing an adjusting screw into the waveguide. However, some form of electrical tuning is normally required as well.

The tuning can be achieved in two ways. The first is to use a varactor diode and this is coupled into the Gunn oscillator circuit. By changing the voltage on the varactor diode its capacitance will change, and this will vary the frequency at which the whole circuit resonates. This method is cheap and easy to implement, but it has a number of limitations. In the first case it only operates over a limited range. Secondly, this method gives rise to a high level of phase noise and this may not be acceptable in many applications.

A more satisfactory method of tuning uses a device called a YIG. This contains a ferrimagnetic material called Yttrium Iron Garnet. The Gunn diode is placed into the cavity along with the YIG, which has the effect of reducing the effective size of the cavity. This is achieved by placing a coil outside the waveguide.

When a current is passed through the coil it has the effect of increasing the magnetic volume of the YIG and hence reducing the electrical size of the cavity. In turn this increases the frequency of operation. This method gives much lower levels of phase noise and it's found that the frequency can be varied over a much wider bandwidth.

In the August issue I'll be looking at the IMPATT Diode.
May 24: The 22nd East Suffolk Wireless Rally will be held at the Sandling Hotel, Great Yarmouth, Norfolk. The rally will open at 9am and close at 5pm. For further details, please contact Mr. G. Jefferies on 01733 301211 or G0UGO@compuserve.com.

May 7: The Ripon & District Amateur Radio Society (RADRS) is holding their 18m Sussex Amateur Radio Rally at the Clandehoe Lodge Hotel, Bellerose, East Sussex. The rally will open at 9am and close at 5pm. For further details, please contact the organisers direct. Editor.

If you’re travelling a long distance to a rally, it could be worth printing your calling card 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.

To order your subscription please use the Order Form on page 82 of this issue or call the Credit Card Hotline on (01202) 659930 and quote Subs 6.
The Royal International Air Tattoo (RIAT) is now in its 27th year and this year the event also marks the 80th Anniversary of the Royal Air Force. The RIAT takes place over the weekend of 25 & 26th July at RAF Fairford, Gloucestershire. The RIAT is run annually to raise much needed revenue for the charitable works of the Royal Air Force Benevolent Fund and over the years three million pounds has been raised.

This year's RIAT will offer visitors the chance to see hundreds of aircraft from over 30 nations, many taking part in sensational aerobatic routines, together with vintage planes and modern jets all coming together to provide a blend of exciting entertainment. In commemoration of the RAF's 80th Anniversary, an 80 minute aviation spectacular finale will unfold the history of the RAF.

The gates to the event open at 6.30am and the flying programme runs from 10.00am and there will be plenty of attractions to fill the day. If you have even the slightest interest in aircraft the RIAT is not to be missed, so, why not take part in our free-to-enter competition and who knows, you could be one of over thousands of spectators attending the world's biggest military event?

How To Enter

To be in with a chance of winning one of 15 pairs of tickets to this spectacular flying event All you have to do is find the words hidden in the wordsearch and then send your entry to Practical Wireless, RIAT Competition, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW by 26 June 1998. Please remember do not include other correspondence with your entry form (photocopies are acceptable). The Editor's decision on the winner is final and no correspondence will be entered into.

From time to time the RAF Benevolent fund may wish to send you details of other events or services which they feel may be of interest to you. Please tick this box if you do not wish to receive this information.
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C.M.HOWES COMMUNICATIONS

Practical Wireless, June 1998
Welcome to Electronics-in-Action (E-i-A), a news and views column that you, as readers, decide the direction. Pose a question and I'll find an answer for you - or if I can't, I'll try and find a person that can. I also hope to publish your electronic tips and tricks and the authors of the ideas I use in any month will get a voucher to 'spend' at our PW Book Store. And in each issue I'll have a look at a few books to suit all levels of knowledge and skills.

**Conundrum Answers**

The answers to the little problem I left you with last time has been well received and many of you sent in some answers that were very brief, others a full page long. It was very pleasing to note that there was only one wrong answer this time. Although I did manage to make the problem a little more difficult than I intended, by not stressing that the variable capacitor should be assumed to be 'perfect'. By 'perfect' I mean that it was 50pF at maximum value and 0pF at the minimum.

I'd intended that there should have been two simple possibilities for the combined minimum value of C2, the variable, and C3 a fixed 100pF component. The minimum combined capacitance value was to have been 50pF (C2+C3=100pF), and, the combined maximum value should have been 60pF (C2+C3=150pF), which were easy to work out without a calculator.

The two intended values should have given a minimum tuned frequency of 20.347MHz and a maximum tuned frequency of 22.508MHz. If however, you assumed that C2 had a 3-50pF swing then the maximum tuned frequency became 22.334MHz. There is though, a lesson to be learned from these figures and, that is that even small amounts of 'stray' capacitance will seriously affect the tuning range of any circuit. Note the difference of 165kHz in the maximum frequency with just 3pF of 'stray' capacitance.

**Simple Interface**

I needed a simple interface recently after I began 'playing' around with slow-scan TV and I experienced a small signal. After I began 'playing' around with slow-scan TV and I experienced a small signal. After I began 'playing' around with slow-scan TV and I experienced a small signal. After I began 'playing' around with slow-scan TV and I experienced a small signal. After I began 'playing' around with slow-scan TV and I experienced a small signal.
As many of you know, I use computers a great deal in everyday life. I think they are superb tools for anyone interested in electronics. As a teaching tool they can be without doubt unbeatable. With a well designed program, computers can become instructors with unparalleled patience as either total or top-up teaching.

**Electronics Principles**

One rather good program that I’ve found for you is Electronics Principles 5.0. As it has now reached version 5 what is Electronics Principles 5.0? That question has rather more than one answer, as it’s a ‘principles’ demonstrator, an aide-memoire, an electronic problem specific calculator and it manages this without a linear structure as you can jump from topic to topic at will.

Needing only a minimalist mid-range IBM PC (486DX2/66 running Windows 3.1) to run, the programs installs quickly and easily from the supplied three 1.4Mb floppy disks. The program runs extremely slickly when on a Pentium powered ‘brute’ with more memory and Windows 95, as you would expect. On running the program, you are then presented with a simplistic textual ‘sign-on’ screen that doesn’t prepare you for the range of principles covered.

The range of electronics covered is very wide, from simple atomic structure to the workings of the latest microcontrollers. You may choose your subject by scrolling down a complete list, or by choosing from a comprehensive series of 10 drop-down menus. The main menus are: DC, AC, Power, Semiconductors, Op-Amps, Maths, Logic, Measurements, Micros and, the latest addition, the PIC 16CXX series of microprocessors.

By ‘printing’ the text, in an active box or screen, to the clipboard, you can quickly make up your own notes to refer to later. For colleges and schools (or training organisations) a simple site licence agreement is available to allow an unlimited number of users at one location. This site licence also allows the unlimited distribution of screens from within Electronics Principles as either student handouts or to make up ‘multi-media’ presentations.

I was very impressed with Electronics Principles 5.0 as it ran smoothly and without problems on several IBM PCs machines that I tried it out on for ease of use. The only problem I came across was when running it on an Windows Emulator on the Macintosh PowerPC 'clone' that I am writing this column on. This problem I will have to talk over with the supplier of the emulator software as I encountered no problems at all on the IBM PC clones.

The many ‘grabbed’ screens of just a few of the many topics available should give you an insight into the capabilities of Electronics Principles 5.0 supplied by EPT Educational Software. An additional stand-alone program called Electronics Toolbox 3.0 is also available from EPT. This less costly program would be suitable for more advanced users looking for a computer based ‘calculator’ specifically for electronics problems.

The full Electronics Principles 5.0 costs £99.95 and Electronics Toolbox 3.0 costs only £19.95 and both are available from EPT Educational Software at Pump House, Lockram Road, Witham, Essex CM8 2BJ. Tel: +44 (01376) 514008. If you have Internet access then you can request more details from EPT by E-mailing sales@eptsoft.demon.co.uk or point your web-browser at http://www.eptsoft.demon.co.uk and following the screens.
Dealers in Your Area

JAB Electronic Components has sent me a copy of their 1998 catalogue, and it makes interesting reading. The 60-page A4-sized catalogue is packed with components, kits and kits for all levels of electronics. Laid out in alphabetical order by type of component it wends its way from 'Audible Devices', through 'Batteries & Accessories' and 'Capacitors' through to 'Semiconductors' and 'Transformer & Inductors', before two pages of a full alphabetical index.

Peter G7JAB has put together two pages of special offers on transistors and components to supplement your 'junk-box'. Find all these in the 1998 JAB catalogue, send £1 to receive your catalogue from JAB Electronic Components, PO Box 5774, Birmingham B44 8PJ. Tel: 0121-682 7045 or FAX: 0121-681 1329.

Diverse Devices, of Southampton, can supply their 'CAT on a DISK' catalogue on a low density IBM PC formatted disk. All you have to do is contact them with your name and address. The 18 plain formatted text files are in PC format and may be imported directly into your word-processor of choice, running under Windows or DOS. They may be imported into any computer that can understand the plain text format for viewing, so they are readable on Apple Macintosh, Acorn Archimedes, Atari ST and STFM, and Amiga computers.

For the Diverse Devices 'CAT on a DISK' write to: 75 Priory Road, St. Denys, Southampton. Tel: (01703) 584680. For those of you with internet access, point your browser at http://homepages.tcp.co.uk/~diverse for more information.

If you live in the Mansfield area Sherwood Electronics can supply many of the bits that you need, their speciality is the £1 pack. A pound coin will bring you a pack of 100x1N4148 diode, or 20x8C182 transistors, or 30x1N4002 diodes or 15xred 1.e.d.s...the list goes on. For details of the £1 packs (buy 10 and you get one of your choice free) and other lines that Sherwood can supply send £1 to cover the catalogue and postage to Sherwood at: 7 Williamson Street, Mansfield. Notts NG19 6TD.

Dick Pascoe G0BPS is a well known member of the G-QRP club for his gentle(!) sense of humour, but did you know that he has been supplying kits and components for some 11 years now? Better known as Kanga Products in his guise of kit supplier, he’s sent me his 24-page 'Spring 1998' catalogue. The catalogue is filled with descriptions of kits, such as 'The Sudden', the 'Spectrum Wavemeter' (both projects that have been featured in PW), receivers, transmitter, Novice course kits and converters as well as three Morse keyer projects.

To get your copy of the latest Kanga catalogue, contact Dick at Kanga Products at Seaview House, Crete Road East, Folkestone CT18 7EG. Tel/FAX: +44 (0)1303 891106. For those with internet access E-mail to: sales@kanga.demon.co.uk or point your browser at http://www.kanga.demon.co.uk for the latest information.

The above names are just a few of the many dealers that can supply bits and pieces for the practical side of the hobby. It isn’t, at present, a definitive list. Can you help others in your area, by letting me know of dealers that you use? How about sending me the name, address and telephone number of the suppliers you use?

Are you a supplier of components? and would like to let the readers know where you are? Details to me at the office (or via E-mail to tex@pwpub.demon.co.uk) marked 'Electronics-in-Action', so I can add them to the list! Tex.
Let me now turn to a few books that I’ve been looking at since the last column. The only specific “radio” book is Build Your Own Intelligent Amateur Radio Transceiver by Randy L. Henderson. A book with over three hundred pages more than just describe how to make an H.F. rig with digital readout, Randy also deals with test equipment that you can build to evaluate how the set is working.

In the 19 chapters, circuits for audio, modulation (s.s.b. d.s.b. and c.w.) i.f. (both high and low frequency) frequency generation and control of synthesisers, problems with synthesisers and transceiver design choices, there are chapters about how to create the “operating system” for your transceiver using an 8031/51 micro-controller.

The final three chapters are: “A spectrum analyser projects and test equipment issues”, “A sweep-frequency generator for crystal-filter evaluation” and “Power distribution and operating techniques”. This really is a brilliant book - even if you don’t intend building the transceiver - as the information gives a good insight into all the principles and techniques.

On the computer side The BIOS Companion from Phil Croucher should be in the library of anyone who ‘messes about’ with computers. Recently brought up-to-date this book really is full of information about the settings that you may have found in the BIOS of your IBM PC/Clone.

Billed as “The book that should come with your motherboard!” it filled in my knowledge of the ‘goings-on’ inside the many computers I’ve been asked to help with by members of my radio or computer club. For more information contact Electrocution Technical Support Services, at Unit 7c, Stonefield Park, Chilbolton SO20 6BL. Tel: (041) 808666. If you have internet access, point the web-browser at http://www.electrocution.com and follow the pages.

Many students of electronics start off by building audio amplifiers, as the circuit may be evaluated quite quickly - the only ‘real’ test equipment needed is a pair of good ears. A new book I’ve come across is Valve & Transistor Audio Amplifiers by John Linsley Hood. (1)

Books Mentioned in This Month’s EiA

The following books may be obtained from the PW Book Store featured elsewhere in the magazine.

Build Your Own Intelligent Amateur Radio Transceiver £24.95

Valve & Transistor Audio Amplifiers £19.95

The Complete Book Of Model Railway Electronics £16.99


So, here was a topic that I was aware of. David Boddington’s book is less about the electronics involved and more about general radio controlled modelling.

There is a wealth of information (much of which I was reading for the first time) within this book for anyone new to the controlled model hobby. The book describes controllers and how they work, how a ‘servo’ works and what you can expect from it. There’s information about how to choose the most suitable controller for your model and what frequency band you should use. A source of basic knowledge about the hobby, and well illustrated with pictures of large flying models, this 160-page hard-back book is well worth the shelf space.

Conundrum Question

This month’s conundrum is a fairly simple one and it concerns the Wheatstone bridge circuit shown in Fig. 2. The problem is: given the values of R1, R2, R3 and R4 what value of RX is required to give a zero reading on the meter (which is a centre-zero movement with a full scale deflection of 500μA in either direction)?

Answers to me, please at the editorial address, marked ‘Tex’s Conundrum 3’ by Monday June 15.

The correct answer drawn out of the editorial hat wins a voucher to spend in the PW Bookstore.
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Practical Wireless, June 1998
John Hoban G3EGC has 'revisited' a popular little 1.8MHz a.m. transmitter-receiver first published by PW in 1994, and has come up with some interesting modifications.

In recent years there's been a revival of 1.8MHz 'Top Band' a.m. activity ....

In recent years, there has been a revival of 1.8MHz 'Top Band' a.m. activity in the Greater Manchester area where I live. Every Sunday morning at 11am on 1.963MHz the '1963 Net' can be heard in full swing.

I'm one of a group of regular Net members who have bought about the Top Band revival. So, it's in this scenario, that my interest was caught by the article 'The PW Top Band Tourer Transmitter Receiver' by Clive Hardy G4SLU in the July 1994 issue of PW. Its simplicity appealed to me and I decided to construct it.

A local print shop made a transparency of the p.c.b. mask (July 1994, page 28, Fig. 4,) and I borrowed a UV light box from Bury Radio Society. By following the instructions in Maplin's catalogue on the use of their Pre-Sensitised Copper Clad Boards (Order No JP56L), I produced an excellent p.c.b. which was accurate in every detail.

Easily Obtained
Components not already in the junk box were easily obtained from Circit and Mainline. The whole thing went together with no

Fig. 1a/b: Circuits for the modifications required for using the higher power p.a. stage (see text).
Fig. 2: Close up view of the higher power p.a. stage mounted in G3ECG's transmitter-receiver (see text).

Footnote:
RSGB Radio Communications Handbook

There are two errors in the RSGB Handbook (6th edition) circuit I used. Please refer to your copy and if you see in the layout drawing (Fig. 5.65), that a connection is shown from T1 to the drain of TR1, it is incorrect as this should go to the gate of TR1. The circuit diagram (Fig. 5.64) is correct. Also in the details under Fig. 5.64, T2 and T3 have two, not three 11t loops. Please note that later editions of the Radio Communications Handbook carry a corrected version of the circuit.

difficult and it worked first time. With R4 set at the earthy end it produced about 1W into a 50Ω dummy load.

First 'on the air' reports were very encouraging and with the help of the Net members I was able to find the right position of R4 to give the best speech quality. However, this resulted in a reduction of r.f. output to about 50mW (output measurements were made with one of Alan Lake’s PM20 power meters).

Different microphones were tried but as Clive G4SLU suggested, a cheap dynamic, low impedance, hand-held microphone produced the best results. First reports of too much bass were corrected by reducing C2 to 0.47pF. (No doubt, different microphones would require individual attention).

On applying my frequency counter to the transmit oscillator, I was surprised to find the frequency was quite a bit below 1.963MHz even though the crystal was ordered for that frequency. This puzzled me at first until the penny dropped. I had not given much thought to the crystal order and so it was produced for the normal 30pF loading.

Examination of the oscillator circuit soon revealed that the capacitive loading created by C4 and C5 is well in excess of 30pF, thus lowering the crystal's effective frequency. This problem was solved by connecting in series with the crystal to earth a 10pF capacitor paralleled with a tiny 20pF variable. Careful adjustment of the variable set the oscillator exactly on 1.963MHz.

Receiver Loudspeaker
I fitted the receiver with an 8Ω 3.5in diameter loudspeaker from an old transistor radio and I have been most impressed by the audio quality. Also impressive is the receiver's sensitivity and it pulls in all that I would hear on the normal receiver - a rebuilt Marconi CR100. However, the receiver does fall down badly on selectivity and I have found it to be very broad. Sometimes when listening on 1.963MHz I get breakthrough from a Net on 1.940MHz. Given the simplicity of the design however, I do not consider this a serious problem and it has not detracted from my enjoyment of this little rig.

With only 500mW output, signal reports were well down on my usual 10W input, valve transmitter. Nearby stations got R5 copy but more distant stations struggled or did not copy me at all. So, I then began to give some thought about how to increase the output power.

"I've had much fun & satisfaction in working on this little rig."

Handbook Answer
A browse through my copy (6th edition) of the RSGB Communications Handbook provided the answer to increasing the power output. On page 5.23 in the chapter ‘Building Blocks’ I found an excellent power amplifier using a pair of IRF510 Mosfets in a push-pull circuit (see footnote). I built it on Veroboard following roughly the layout in Fig. 5.65 in the Handbook.

With 14V supply, the circuit gave 5 to 6W first time into the power meter. On the air reports were immediately back to those I receive using my valved transmitter with all stations getting good copy. The new p.a. is most certainly a vast improvement.

My ‘Tourer’ is housed in a Maplin Vinyl-Effect box, type WR3 with the loudspeaker mounted on the suitably cut-out top. The p.a. Veroboard had to be made into two halves in order to create space for the loudspeaker magnet. Circuit modifications required for use with the new p.a. stage are shown in Fig. 1., while Fig. 2 shows a close-up photograph of the new p.a. stage, installed in my ‘Tourer’. I have had much fun and satisfaction in working on this little rig. I have even carried out tests in the car with a view to using it mobile, but a recent change of car has halted this work. But this doesn’t stop me using it from home - so I look forward to working you on Top Band!

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I seem to be doing more and more operating in the car lately. Even most of my h.f. operating is now mobile. So, I always enjoy the opportunity of looking at new mobile equipment and therefore readily agreed to look at the new offering from Kenwood, the TM-G707E.

The TM-G707E is a 144/433MHz dual-band (one band operation at a time) transceiver. It can be converted to cover Airband and the Marine band, but is supplied with the Amateur Bands only.

This latest Kenwood offering is supplied with mobile mounting bracket, a Kenwood MC-45 Microphone with Up/Down keys along with four function keys, a d.c. cable with in-line fuses and a comprehensive handbook are also included.

The TM-G707E has a good quality 'N' type antenna connector on the rear of the unit as well as the normal 3.5mm jack socket for an external speaker. On the front of the radio are the modular microphone socket and a Data connector socket for dedicated Packet and RTTY operation.

The TM-G707E has a small detachable head, which was one of the first things that impressed me. It's very easy just to take off and put in a pocket or handbag and provides a good security feature.

An optional extra connection cable allows the radio to be mounted in the boot or under a seat and the just the head mounted in the car. This way of mounting helps those of us with modern cars that seem to have nowhere to put a radio!

Richard Newton
GORSN, PW's very keen mobile operator has been putting the new Kenwood TM-G707E dual-band mobile transceiver to the test, here's how he got on.......
**Smart Looking**

The TM-G707E is a very smart looking radio with the detachable head containing the display and all the transceiver's controls. The controls are well set out and are labelled both on the case and on the I.C.D. display. The controls are well thought out, with the tuning knob used to go 'up and down' memories, v.f.o. ranges and menu options. The tuning control also has a button set inside it which when depressed allows you to tune in 1MHz steps (I liked the fact this could easily be done with one hand).

The squelch and volume rotary controls are easily accessible. Band change and call frequency recall along with power-out selection are all simple operations to carry out. I got the distinct impression that the designer of the TM-G707E is a mobile radio operator!

And what a display! In my opinion the display on the TM-G707E is wonderful. It's huge in comparison with others I have seen. There's absolutely no doubt what frequency you are operating on and even the smaller items on the I.C.D. can be seen easily. The display can be backlit with varying levels of yellow light, which is very effective. And it's just another example of a small but extremely useful function.

The transceiver can be set to have a dim back light but on the use of a button or control the display becomes brighter for a couple of seconds. This I found very useful at night as it meant I didn't have to drive with a bright light glaring at me from the dash but when I needed to see the radio's display, there it was in all its glory.

The TM-G707E comes with all the features I would expect to see on a radio of its calibre. It has 180 memory channels that can contain separate transmit and receive frequencies as well as simplex frequencies. These memory channels can also hold other information such as tone squelch. Each memory channel can be given an alphanumeric name up to 7 characters long, for example repeater or packet BBS callsigns.

The radio is also very versatile, it can be switched on and used giving the operator excellent service without the need to do very much at all. On the other hand, through the easy-to-use menu, the transceiver can be set up with many advanced features.

**Optional Extras**

I was interested to see that the TM-G707E radio is also supported by a veritable army of optional accessories. One of the many optional extras is the voice module (the review model had this included) and I think this would be an 'absolute must' for those whose sight is impaired.

Among its many uses the voice synthesiser announces if the transceiver is on v.f.o. or memory mode, and will announce when you have selected menu options and announce memory number and frequencies. I programmed one of the microphone buttons to the voice feature, so that while I was driving along I could make sure I was monitoring the correct frequency by pressing the button and allowing the radio to announce what the current working frequency was.

Other optional extras include a detachable front mounting kit with a choice between 3, 4 or 7m cable lengths. There's also a multi-function DTMF Microphone, a data cable, a modular to old style microphone connector adapter cable and a modular plug microphone switch also available.

**Sensible Way**

The sensible way to get the most out of a new rig is to make a pot of tea and sit down with the manual. How many of us actually do this? Precisely ... not very many! And that's the reason why when I get a rig to review I unpack it, turn it on and try using it.

By 'using' the rig I don't mean just speaking to someone. I mean being able to programme a memory, assign memory names, tune the v.f.o ranges, change bands, and select shift and reverse frequencies. If I can do most of these without reading the manual, I consider the achievement to be an indication the radio has been thoughtfully designed.

I'm pleased to say I was able to do all of these on the TM-G707E without referring to the manual. So, the next job was to see how it worked 'on air'.

**Mobile Operations**

I was delighted to find out the case dimensions of the TM-G707E were the same as my existing mobile rig, another dual-bander from Kenwood, the TM-732E. I have a slide-in/slide-out mount for my '732 so all I had to do was to put the sliders on the new
The small detachable head is very easy to take off, which also makes it a good security feature.

I got the distinct impression that the designer of the TM-G707E is a mobile radio operator.

Manufacturer's Specifications

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>144 to 146MHz 430 to 440MHz</td>
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<tr>
<td>Mode</td>
<td>F3E (f.m.)</td>
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<tr>
<td>Antenna Impedance</td>
<td>50Ω</td>
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<tr>
<td>Usable temperature range</td>
<td>-20°C to +60°C</td>
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<tr>
<td>Power Supply</td>
<td>13.8 V DC ±15%</td>
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<td>Grounding method</td>
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<td>Current</td>
<td>VHF UHF</td>
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<tr>
<td>Transmit Max.</td>
<td>11A or less</td>
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<tr>
<td>Receive 2W out</td>
<td>1.0A or less</td>
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<tr>
<td>Frequency stability</td>
<td>10° to +50°C Within ±3ppm</td>
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<td>Dimensions</td>
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<td>Power Output</td>
<td>High 50W (144MHz) 35W (430MHz)</td>
</tr>
<tr>
<td>Modulation</td>
<td>Medium Approx. 10W Low Approx. 5W</td>
</tr>
<tr>
<td>Spurious emissions</td>
<td>-60dB or less</td>
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<tr>
<td>Maximum frequency deviation</td>
<td>±5kHz</td>
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<tr>
<td>Audio distortion (at 60% modulation)</td>
<td>3% or less</td>
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<td>Microphone impedance</td>
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<table>
<thead>
<tr>
<th>Receiver</th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Circuitry</td>
<td>Double conversion superheterodyne</td>
</tr>
<tr>
<td>Intermediate frequency</td>
<td>1st 38.85MHz 2nd 450kHz</td>
</tr>
<tr>
<td>Sensitivity (12 dB SINAD)</td>
<td>0.16uV</td>
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<tr>
<td>Selectivity (-5dB)</td>
<td>12kHz or more</td>
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<tr>
<td>Selectivity (60dB)</td>
<td>28kHz or less</td>
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<tr>
<td>Squelch sensitivity</td>
<td>0.1µV or less</td>
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<tr>
<td>Audio output (8W, 5% distortion)</td>
<td>2W or higher</td>
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<tr>
<td>Audio output impedance</td>
<td>8Ω</td>
</tr>
</tbody>
</table>

I then decided to take the radio indoors to see if I could get a few more contacts using it as a base station. For this I have a WX1 dual-band antenna on a pole at the rear of my

On the whole the 144MHz band is quiet in my area. So, on my way to work one evening, driving to Poole, I decided to put a call through the local repeater, GB3SC. I got a good reply from Peter G1IDZ, who was situated somewhere in South Shropshire while sitting in his car. Peter was doing very well to get into the Bournemouth

I then went onto make some more local contacts. One of these was with Keith G3WSN who reported the transmitted audio from the TM-G707E as being, “excellent, crisp and punchy, just what you want”. During another QSO Peter G4TBI said, "very good in the audio department”. The received audio was also very good. Repeater access using CTCSS tones was very simple indeed.

However, 1750Hz was not quite so straightforward as this needs to be assigned to a microphone button. This means you can’t use ‘hands free’, this in turn does mean 1750Hz tone burst repeater access is cumbersome, which meant I had to practice my 1750Hz whistle!

The performance of the TM-G707E was outstanding on both 144 and 433MHz and seemed very sensitive on both bands. It also offers an impressive 50W high power on 144MHz and 35W high power on 433MHz, so you can be sure of talking to stations that you can hear.

I used a middle of the range, dual-band mobile whip when operating and got very favourable reports and results. The versatility of the radio continues with the output power, a medium setting of 10W for each band and a low power of 5W are also options. The radio cools itself by a very quiet, unobtrusive fan assisted by very impressive heat-sinking.

For this I have a WX1 dual-band antenna on a pole at the rear of my
bungalow and as this antenna has not been used in a while I had to crawl around my loft to find the coaxial cable, ... the things I do for PW

With the coaxial cable found and the dust blown from my 30A power supply I was ready to set up. I balanced the TM-G707E on its box and turned it on. A call on 145.500MHz went unanswered, several calls on 433.500MHz also went unanswered.

However, a plaintive cry on the local repeater, GB3SC, did not go unanswered. Lou G1ULZ and John GOVPJ both came back to my pitiful plea for help.

Both Lou and John are relatively local to my QTH. We all moved to a 145MHz simplex frequency and made contact. Lou was situated in West Moors, a village some 8km away from me, John was a little further away in Verwood, about 16km distant from me.

Lou first used a Trio 4000A dual-band rig putting about 2.5W into a 5/8 ground plane for 145MHz on his bungalow, using this set up he was an end stop signal with me. He gave me a 59+ report and after getting me to move my mouth away from my microphone (Thanks Lou!) he reported the transmitted audio from the TM-G707E as, “Very good... Indeed”.

John also gave me an excellent signal report, even when I was on 5W I was still 59+. He was using a Standard C5800, 4W and a WX2 antenna. His comments were all very positive, his comments included “Cracking signal!” ... and “nice audio”.

We all had a very pleasant chat trying the different power settings. No matter how hard we tried we could still talk to each other despite the low power.

John bowed out for a prior engagement and Lou and I continued to experiment. Lou then called me using his Kenwood TH-79E hand-held on the Extra Low setting, Lou described this to be “A few milliwatts”. The TM-G707E still received him 55 and he still described this to be “A few milliwatts”. The TM-G707E still received him 55 and he still described this to be “A few milliwatts”.

We then continued experimenting. Lou called me using his hand-held again, this time I did not hear him, although he did say his batteries may be low. Graham also called me using his IC-Z1E hand-held on low power and we made contact easily, Graham dropped from being a 59+ received signal to about 5 and 7.

The review model had the Airband receive dealer mod activated. I could not resist listening to the local Airport. I have to say that the quality of the a.m. reception was excellent. I did this both in the car and while I had it set up in the house on the WX1 antenna.

So, all in all the TM-G707E did very well on the air. As a base station it’s just as impressive as it is for mobile operation.

The TM-G707E also offers something that I have not seen on any other transceiver. This is what Kenwood call Programmable Memory (PM).

The PM function means that individual settings such as v.f.o. frequencies, memory recall mode (either frequency or channel numbers) Offset direction and Frequency step sizes can be saved as a template. There are four operator templates available on the radio, which means that if you share the transceiver, at a club or within a family of amateurs, up to four people can individually tailor the transceiver to their own requirements.

Joy To Use

Well designed, well built, and a joy to use. That is my conclusion on the TM-G707E.

Reverse repeater monitoring, power output adjustment, band selection and menu access are all single button functions. Yes, this radio was designed for mobile operators and unless I am very much mistaken, mobile radio operators also did the design work.

All in all I think this very smart, well-made little unit is very good value for money. The TM-G707E is very versatile and therefore shows great potential.

For those operators who want to have dual-band capability but are happy to operate only one band at a time then the TM-G707E is worth a good look. The real plus points for me were that as a mobile operator the TM-G707E gave me what I would want, an easy to use, simple to operate transceiver that has the power of advanced features should they be required. The bottom line is – I liked it!

"The TM-G707E is very versatile and therefore shows great potential"

The Kenwood TM-G707E is available from all Kenwood approved dealers for the recommended price of £349.95. All accessories for the G707E are the same as those for use with the TM-V7E.

PW

Practical Wireless, June 1998
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Practical Wireless, June 1998
Once again Adjudicator Neill Taylor G4HXL reminds us that it's time to find the insect repellent, stock up the picnic basket, prepare the portable mast, find that site and get ready for the PW 144MHz QRP Contest.

An Alinco DJ-190 will be awarded to the overall winners.

Fig. 1: Simple power reduction circuit (see text).

When summer arrives, it's time to take to the hills with portable v.h.f. equipment and antennas, for a day of on-air activity which promises to bring some good contacts for everyone. With stations sited in the best locations all over the UK, there should be some good DX to work wherever you are.

You can join in the fun with just a simple 144MHz station, and the 3W output power limit means that you don't need extravagant equipment to compete effectively. For the 16th year, the PW QRP Contest provides the opportunity for newcomers and seasoned contest groups alike to engage in friendly competition for the top positions in the results.

For some, the goal is to become the leading station in their locator square. Others have personal aims such as achieving a higher position than last year, or working some DX that is usually out of reach.

And for the really high performers, there are rich rewards for the overall winners, who will receive the coveted PW QRP Contest Winner's Cup and a special prize of an Alinco DJ-190 144MHz hand-held transceiver, kindly donated by Mike Devereux G3SED of Nevada Communications.

The runners-up will be awarded a special prize of either a portable battery pack or a portable mast, kindly donated by Bob Keyes GW4IED of Key Solar Products.

The Tennamast Trophy in Memoriam to Frank Hall GM8BZX, donated and sponsored by Tennamast (Scotland) Ltd., will be awarded to the leading Scottish station.

Entries from Ireland aren't forgotten either, as for the second year the PW EI/GI Trophy Clock will be presented to the leading station in Eire or Northern Ireland.

Certificates Awarded
Certificates will also be awarded to the leading stations in a number of categories, including leading single operator, and the leading station in each locator square. So why not have a go and try to win one of these?

Entries along with a review of the contest and results, will be published in Practical Wireless later in the year.

Even if you are a regular entrant to the PW QRP Contest, please take the time to read the rules thoroughly. When submitting your entry, please be particularly careful to supply all the information required by Rule No. 6. Every year some entrants lose valuable points through being penalised for incomplete details here. Be sure to provide the list of all the locator squares you have contacted, and check that in your log you have highlighted in some way the first contact in each new square.

You'll probably find it easier, and it's certainly better for the adjudicator, if you use the blank log sheet and covering information sheet available for downloading from the PW QRP Contest pages on the Internet, at http://www.rmplc.co.uk/eduweb/sites/ntaylor/pwqrp.html (you'll also find complete results from many previous contests here).

New To VHF Contests?
If you're new to v.h.f. contests, then please don't be afraid! You couldn't have chosen a better event to get started - you'll find everyone you contact friendly and welcoming.

All you need is a 3W 144MHz transceiver, preferably ssb, as this is where most of the

Practical Wireless, June 1998
activity is. A good antenna is highly valuable, as is a good site to operate from.

You may find it easier to get together with a group of friends, as it takes a lot of concentration to operate continuously for seven hours. The key to success is to prepare well, try out all the equipment beforehand, and keep well-organised during the contest.

Also remember that the mark of a good contest operator is to be brief and precise in the exchanges. Avoid needless repetition, but at the same time be sure that both sides of the QSO have logged all the information correctly. Being in too much of a hurry can be as ineffective as being long-winded.

Finally, a good measure of luck is helpful, in reaching those DX locations and working the remote squares. So, let's hope that we get some good propagation conditions to really set the band alive! Above all, I hope everyone taking part really enjoys the day. Good luck in the 16th contest!

Neill Taylor G4HLX

Contest Rules

1. General: The contest is open to all licensed radio amateurs, fixed stations or portable, using s.s.b., c.w. or f.m. in the 144MHz (two metre) band. Entries may be from individuals or from groups, clubs, etc. The duration will be from 0900 to 1600UTC on 21st June 1998.

All stations must operate within the terms of the licence. Entrants must observe the band plan and must keep clear of normal calling frequencies (144.300 and 145.500MHz) even for CQ calls. Avoid frequencies used by GB2RS during the morning (144.250 and 145.525MHz) and any other frequency that is obviously in use for non-contest purposes. Contest stations must allow other users of the band to carry out their activities without hindrance.

The station must use the same callsign throughout the contest and may not change its location. Special event callsigns may not be used.

2. Contacts: Contacts will consist of the exchange of the following minimum information:

(i) call signs of both stations
(ii) signal report, standard RS(T) system
(iii) serial number, a 3-digit number incremented by one for each contact, starting at 001 for the first
(iv) locator (i.e. full 6-character IARU Universal Locator for the location of the station)

Information must be sent to, and received from, each station individually, and contact may not be established with more than one station at a time. Simultaneous operation on more than one frequency is not permitted.

If a non-competing station is worked and is unable to send his full universal locator, his location may be logged instead. However, for a square to count as a multiplier (see rule 4), a full 6-character IARU universal locator must have been received in at least one contact with a station in the square.

Contacts via repeaters or satellites are not permitted.

3. Power: The output power of the transmitter final stage shall not exceed 3W p.e.p. If the equipment in use is usually capable of a higher power, the power shall be reduced and measured by satisfactory means. The simplest way is often to apply a (variable) negative voltage to the transmitter a.l.c. line, reached via the accessory socket. The output power can be accurately measured using the simple circuit of Fig. 1. Connect this to the 50Ω output of the transmitter and adjust the power so that the voltmeter does not exceed 16.7V on a good whistle into the microphone.

4. Scoring: Each contact will score one point. The total number of points gained in the eight-hour period will then be multiplied by the number of different locator squares in which contacts were made (a 'square' here is the area defined by the first four characters of a universal locator).

Example: 52 stations worked in IK81, I090, I091, I092 and J001 squares; final score = 5 x 52 = 260.

Only one contact with a given station will count as a scoring contact, even if it has changed its location, e.g. gone /M or /P. If a duplicate contact is inadvertently made, it must still be recorded in the log, and clearly marked as a duplicate.

The leading station in Eire or Northern Ireland will be awarded the PW EVGI Trophy Clock.

Neill G4HLX says it's time to join in the PW 'Fun' 144MHz Contest!
5. Log: The log submitted as an entry must be clearly written on one side only of A4 sized paper (210 width x 297mm height), ruled into columns showing:
(i) time GMT
(ii) callsign of station worked
(iii) report and serial number sent
(iv) report and serial number received
(v) locator received (or location).

Underline or highlight the first contact in each of the locator squares worked.

At the top of each sheet, write:
(a) callsign of your station
(b) your locator as sent
(c) sheet number and total number of sheets (e.g. 'sheet no. 3 of 5').

The sample shown in Fig. 2 illustrates how each sheet should be headed.

6. Entries: Accompanying each entry must be a separate sheet of A4 sized paper bearing the following information:
(a) name of entrant (or of club etc. in a group entry) as it is to appear in the results table
(b) callsign used during contest (including any suffix)
(c) name and address for correspondence
(d) details of location of station during contest; for portable stations, a national grid reference is preferred
(e) locator as sent
(f) whether single- or multi-operator (a single-operator is an individual who received no assistance from any person in operating the station, which is either his/her permanent home station or a portable station established solely by him/her); if multi-operator, include a list of operators' names and callsigns
(g) total number of contacts and locator squares worked
(h) list of the locator squares worked
(i) a full description of the equipment used including TX p.e.p. output power
(j) if the transmitting equipment is capable of more than 3W p.e.p. output, a description of the methods used (i) to reduce and (ii) to measure the output power
(k) antenna used and approximate station height a.s.l.

Failure to supply the previous information may lead to loss of points or disqualification. The following declaration must then be written and signed by the entrant (by one responsible person in the case of a group entry): "I confirm that the station was operated within the rules and spirit of the event, and that the above information is correct".

This declaration concludes the entry, which should be sent, with the log sheets, to Practical Wireless Contest, c/o Dr. N. P. Taylor G4HLX, 46 Hunters Field, Stanford in the Vale, Faringdon, Oxfordshire SN7 8LX. A large s.a.e. should be enclosed if a full set of contest results is required.

Any other general comments about the station, the contest and conditions during it are welcome, but should be written on a separate sheet of paper. Photographs of the station are also invited (but please note that these cannot be returned); if these are not available by the time the entry is submitted they may be sent later, to arrive by 10th August 1998.

7. Miscellaneous: When operating portable, obtain permission from the owner of the land before using a site. Always leave the site clean and tidy, removing all litter. Observe the Country Code.

Take reasonable precautions to avoid choosing a site which another group is also planning to use. It is wise to have an alternative site available in case this problem does arise.

Make sure your transmitter is properly adjusted and is not radiating a broad or poor-quality signal, e.g. by over-driving or excessive speech compression. On the other hand, be aware that your receiver may experience problems due to the numerous very strong signals it will have to handle, and that this may lead you to believe that another station is radiating a poor signal. Before reaching this conclusion, try heavy attenuation at the receiver input. The use of a high-gain r.f. pre-amplifier is likely to worsen strong-signal problems, so if you do use one, it is best to be able to switch it off when necessary.

8: Adjudication. Points will be deducted for errors in the information sent or received as shown by the logs. Unmarked duplicate contacts will carry a heavy points penalty. Failure to supply the complete information required by Rule 6 may also lead to deduction of points.

A breach of these rules may lead to disqualification. In the case of any dispute, the decision of the adjudicator will be final.

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Fig. 2: Sample log sheet for PW 144MHz QRP Contest (see text).
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Practical Wireless, June 1998
This month Geoff Pike GIOGDP describes the final constructional stages of his low power handheld transceiver project.

In this, the third and final part of the GDP-430 project, I'm going to describe the final stages of construction. And I hope - for those of you who are underway by using the previously published circuit - that it's a case of 'Okay so far'?

I advise that you build the transmitter section carefully using good v.h.f. and u.h.f. techniques. No long leads, and if you make the p.c.b.s. yourself make sure they are good quality fibreglass.

Once you've completed the transmitter board, check all the tracks and ensure there are no solder blobs and other short-circuits. And if all is well, it's onto the transmitter alignment.

Personally, I've no doubt that once having seen the photographs of my prototype you'll agree that alignment is best done initially outside the case and then fitted afterwards. It may then be necessary to go over some of the adjustments and adjust slightly for best performance.

Alignment Process

To start the alignment process, you should select the appropriate 3rd overtone crystal and preset L1 to about 3mm into its former. The variable capacitor C9 should be set 35% meshed, C12 80%, C16 55%, C19 20% and C24 30%.

When you've inserted the crystal, there should be a rise in current drawn to approximately 35mA. As with the receiver local oscillator, C7 may need to be padded with 2.7pF until reliable starting occurs.

Ensure that the varicap diode is temporarily 'tied' to mid supply voltage level with R18/17. Now peak C12, 16, 19 and 24 for maximum output, and adjust HF1 (but this will only need 1-2 turns on each slug).

Next, check that the voltage drop across R16/17 is about 0.55V (i.e. 55mA). The BFR90S is rated at 100mA/12V, so caution is needed not to exceed its rating. To that end, do not remove R18, R19 and or 20 in the quest for more power.

When everything is adjusted and tuned up, approximately 350mW will be available at the antenna socket. This is because losses in RLA are unfortunately unavoidable for such a low cost switching relay used at this frequency.

Total current drawn in between 160-200mA depending on final output power. Temporarily connect a variable supply to R8, so as to swing the voltage mid-point ±2V. Check that a deviation of ±3.5kHz is available, i.e. a total of 7kHz.

Adjust C9 to achieve the required deviation, and then check that the centre frequency is the crystal frequency x 6. The adjustment of C9 and L1 will obviously interact to some degree, but it is possible to achieve a good compromise between centre frequency and deviation.

Tone Burst

The tone burst on my prototype is on the same p.c.b. as the audio amplifier. It's straightforward and there's nothing special required except to check that the crystal frequency of XL2 is 3.579MHz.

You should also verify that the output of the IC4020 (pin 15) is 1748Hz. This should have a duration of about two seconds when power is applied. (This can be adjusted with R40 to suit individual repeaters).

A small piece of 1.5mm diameter wire is used to connect the negative side of the board to ground plane of the receiver board, providing extra mechanical rigidity as well as a ground return. Tone burst level can be preset with R42 to about 20% away from ground potential.

Microphone Board

The microphone board is fitted as close as possible to the transmitter board. Additionally all connections must be made as small as can be achieved mechanically.

Alignment of the microphone board is achieved as before, ensuring that the variable capacitor C9 is set 35% meshed, C12 80%, C16 55%, C19 20% and C24 30%.

When everything is adjusted and tuned up, approximately 85mW will be available at the microphone socket. This is because losses in RLA are unfortunately unavoidable for such a low cost switching relay used at this frequency.

Total current drawn in between 100mA depending on final output power. Temporarily connect a variable supply to R8, so as to swing the voltage mid-point ±2V. Check that a deviation of ±3.5kHz is available, i.e. a total of 7kHz.

Adjust C9 to achieve the required deviation, and then check that the centre frequency is the crystal frequency x 6. The adjustment of C9 and L1 will obviously interact to some degree, but it is possible to achieve a good compromise between centre frequency and deviation.

Fig. 1: The microphone amplifier and modulator board component side.
Ensure that the board has a good earth with a mounting bolt into the case side with a single countersunk bolt. Ensure that L2, a 1.5\(\mu\)F moulded choke has a short run between the microphone amplifier and the varicap diode. The deviation control R28 can initially be set about 30% from ground potential.

**Relay Control Board**

Now it's on to the relay control board, and in my prototype the antenna change-over relay is controlled by a small p.c.b. mounted on the case side opposite the transmitter board. It should be mounted as close to the microphone socket(s) as is possible.

Operation is simple and only requires a swamp resistor across the electret microphone of approximately 1 k\(\Omega\) (if not already fitted). This will ensure sufficient current flow to activate the c/o relay via the switching transistors Tr9, 10 and 11.

However, if you decide to use an ordinary 4 pin CB type of microphone, the board is not needed. In this case R35 will allow control of the amplifier’s sensitivity.

---

**Fig. 2:** The underside of the microphone amplifier board.

**Fig. 3:** The transmitter board overlay.

**Fig. 4:** As space is tight a few components must be mounted on the track side of the transmitter p.c.b.
Final adjustments when in a suitable case will include checking with another station for modulation quality and also adjustment of the tone burst duration. Additionally, you may notice that when the unit is 'up and running' that the squelch control can be backed off after a few minutes to advantage. (This is because in practice the threshold seems quite temperature dependent).

Choosing The Antenna

When it comes to choosing the antenna there are several options. It could be a commercial helical or a 1/4 wave whip as needed.

However, for my prototype I used a 5/8 wavelength antenna which was easily made from welding rod and a BNC plug. The plug was shrouded with an ‘in-line’ fuse holder outer to support the base matching coil. I then slipped the fuse holder over the assembly and filled it with epoxy resin.

Be aware that if you use a 1/2 or 5/8 wavelength antenna that some experimentation will be needed to find the best reception, especially if you are moving about the house. And don’t forget to incorporate some form of protection at the tip of the antenna - it’s all too easy for a whip antenna to be used as a rapier!

Your Hand-Held

When it comes to building your version of the GDP-430 I’ll be pleased to hear from you. Obviously there will be differing requirements for each constructor but if you do wish to contact me directly to discuss the project please do so.

The p.c.b.s for this project will not be available from the PW PCB Service. Instead, I can provide you with the prototype p.c.b. designs I used and up-dates on the project if you enclose a large s.a.e. (50p stamp).

You can write to me at 2 Windslow Drive, Carrickfergus, County Antrim, Northern Ireland BT38 9BB. However, please remember that I’m not available on the telephone.

So, whatever form your GDP-430 takes - good luck and I hope you enjoy building the project. Home-brewing a u.h.f. transceiver Is a challenge but it’s also very enjoyable!

Errors & Updates

In Fig. 1b on page 68 of the November 1997 issue of PW the resistor R118 may be modified to 1.5kΩ rather than the 2.2kΩ as shown.

In Fig. 1c (p 68) the connection shown from the top of R123 to the top of R120 should not be there. The top of R120 should be connected to the junction of C137/R123/L104.

Also in Fig. 1c the connection shown between R129 and the +12V (Rx) line should go to the junction of R131/C146/L106.

On Fig. 1d (p 68) R6 should connect direct to the +8V supply from IC1 rather that to L2/C5 junction as shown.

In Fig. 5: A small section of Veroboard was used to make up the transmit/receive changeover circuit.

In Fig. 6: Looking behind the front panel shows a tightly mounted group of components.

Table:<br>

<table>
<thead>
<tr>
<th>12V</th>
<th>R10</th>
<th>Tr10</th>
</tr>
</thead>
<tbody>
<tr>
<td>+12V</td>
<td>R11</td>
<td>Tr11</td>
</tr>
</tbody>
</table>

The resistor on the base of Tr2, shown as R12 should be labelled R11.

For maximum stability the r.f. filter, C27/L10 (Fig. 1g) should be mounted on the microphone socket direct.

In Fig. 4 on page 50 of the May 1998 issue of PW the lower component marked C102 on the left hand side of the photograph should have been labelled Tr102.

The coils L102 is wound in one lead of R102, and L103 is wound in one lead of R104. Both should be two turns and 3mm internal diameter.
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Gerald Stacey
G3MCK
'coaxes' you to use some simple tests to see if that 'bargain' length of coaxial cable is any use.

A radio wave travels slower in a cable than in 'free-space' so, wavelengths within the cable are always shorter than in free-space.

with a tape-measure. The ratio of the length of the coaxial cable to the free space $\lambda/4$ is the velocity factor.

Word Of Warning

I must just mention a word of warning to those of you who are using a g.d.o. with a simple dial read-out. To obtain a good result some care is needed. You must lightly couple the g.d.o. to the cable through a single turn coil which joins the braid of the coaxial cable to its inner.

Having found the initial 'dip', further reduce the coupling to the minimum and either use a frequency meter or a receiver to find the exact frequency of the g.d.o. The act of coupling the g.d.o. to the coaxial may have 'pulled' the frequency and possibly changed its calibration. Note: Always start from the lowest frequency range setting when looking for the 'dip'.

There is however a better method. Instead of using a g.d.o. you can use a noise bridge and a receiver to find the $\lambda/4$ resonant frequency of the cable, see Fig. 1. Estimate the approximate frequency by calculation as described above. Set both dials on the bridge to zero. At the resonant frequency of the coaxial cable under test there will be a marked fall in the level of the noise which is heard in the receiver. This is because the length of cable under test behaves as an open circuit $\lambda/4$ stub, putting a short circuit across the receiver and the bridge.

Characteristic Impedance

Do have a look at my earlier article dealing with characteristic impedance of a coaxial cable, for which we usually use the symbol $Z_0$. The $Z_0$ value is solely determined by the physical characteristics of the cable and is quite easy to evaluate. But please note when taking measurements as my old physics master used to say, "Note a micrometer must not be used as a vice!"

Don't worry if your answer is not exactly 50$\Omega$ or whatever. Many cables which we call 50$\Omega$ are not in fact that value. For example, the impedance of RG-58/U is actually 53.5$\Omega$. However, most cables you are likely to meet fall into one of two major groups, those whose impedances are about 50$\Omega$ and those whose impedances are about 70$\Omega$.

Beware; you may encounter RG-62A/U coaxial whose impedance is 92$\Omega$. This cable is semi-airspaced and is widely used in v.d.u. installations and can often be found in skips when a building is being gutted.

Line Loss

Now I'll look at line loss, which is specified loss (in dB) per unit length. The unit length usually is 10m or 100 feet (30m). Make sure you are comparing like with like when you are considering which...
coaxial to buy from a manufacturer. Line loss is very frequency dependent and gets worse as the frequency increases so be certain that you use a loss figure that is comparable with the use to which you are putting the cable. A cable that is excellent for 3.5MHz could be a dead loss (excuse the pun) for the ‘2m man’.

The usual method of measuring cable loss simply measures the power flowing at each end of a matched length of coaxial as shown in Fig. 2. The loss is \(10 \times \log(P_f/P_r)\) dB. If you don’t have an accurate power meter, measure the r.f. voltage at the same points, the loss figure is then \(20 \times \log(V_f/V_r)\) dB.

To compare the loss of your length of coaxial with that of known cables you may have to allow for a difference in lengths between your test piece and the standard length used by the manufacturer. For example, your 20m of cable gave a loss of 1dB, then 30m would give a loss of 30/20 or 1.67dB per 30m.

Another way of measuring the loss is as shown in Fig. 3. Here r.f. is fed via a directional power meter - many s.w.r. meters are suitable for this purpose - into a length of un-terminated coaxial cable. You will remember that in these circumstances all the power which has been fed into the line will be reflected by the open circuit at the far end.

So, if we measure the forward (Pf) and reverse (Pr) powers at the input of the line we can calculate the loss by applying the following formula: loss = \(5 \times \log(P_f/P_r)\). The loss is incurred on both the outward and return journey, so 5 is used in this formula and not 10.

The method must be used with care as many rigs do not like running in an unmatched condition. I have found that running about one watt output and using a sensitive directional power meter gives good results. I use the Stockton Power meter which can detect very low power levels with ease. This meter, should have a normal meter, not digitally driven i.e.d. indicators.

I suspect many amateurs have sometimes wondered whether the coaxial cable feeding their antenna is suffering old age or ingress of water. The last method I’d like to describe can be adapted to check the loss of your dipole feeder without leaving the shack.

If you disconnect the antenna from the feeder you can determine the feeder loss using the above two power method. But, with many installations this may not be too convenient. You could attach a shorting link across the antenna at the feeder point. (A short circuit reflects power in exactly the same way as an open circuit). This too, may not be convenient, but if we operate the dipole at twice its design frequency the cable is now terminated at the centre of a full wave length.

The feed-point impedance is about 5kΩ and the coaxial cable will be operating with an s.w.r. of 100:1. so, it is effectively terminated in a open circuit which, like the short circuit, will reflect all the power. So, at twice the dipole’s design frequency, measure the forward and reflected powers and calculate the loss as described above.

The measured loss will be a little higher than the actual loss due to the test frequency being higher than the operating frequency but this should normally be of no consequence. This method will not work with trap dipoles and G5RV’s. I have only used it with directly fed dipoles and if you are using a balun the results may not be reliable.

**Simple Methods**

These simple methods will enable you to test to see if a coil of coaxial cable is any use. If you are interested in other parameters, such as power handling, it may be necessary to apply intelligent guess-work or go and buy some coaxial cable of a known type. If you need to have more accurate figures then you will have to use more sophisticated measurement techniques.

The ratio, of a signal’s λ/4 length in a coaxial cable, to its free space λ/4 is the velocity factor of that cable.
This month Rob Mannion G3XFD looks at a selection of books written by Ian Poole G3YWX, a prolific author who also writes PW's popular 'What is A...?' series. And quite honestly - this brief look at just a few of his titles is really like 'dipping the toes' into Ian Poole's work!

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**Author Of The Month - Ian Poole G3YWX**

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This month the Rev. George Dobbs G3RJV says “an audio brick will do the trick” when you’re looking for a suitable amplifier for your receiver project - together with an appropriate quote of course!

I'm grateful to PW reader Dr. Simon Newstead G7UEQ for sending me the full text of the “what are the wild waves saying” quotation used by Igranic for their plug-in receiver coils. He sent it to me on a photocopied page from the book Those Radio Times.

Beneath the quotation is a photograph of a ‘wireless stall’ at a church fete in 1922. A placard above the stall says “What are the wild wireless waves saying? Listen in for 3d" I do not know the book but the page I have seen will encourage me to find a copy.

Listening to the Marconi Company station 2LO on headphones in the middle of a church garden fete must have been difficult. Good reception was a rarity. Not so these days, with even the weakest DX stations being enhanced by signal processing and advanced receiving techniques. However, it always amazes me how often the designers of sophisticated radio equipment spoil their efforts by adding a poor audio section and an inadequate loudspeaker on the end of a receiver. Frequently this design failure is faithfully repeated by constructors of home-made receivers.

So often, after spending hours designing a receiver, the conclusion is - stick an LM386 on the end. Although the LM386 audio chip is cheap and uses few external components, its output is low (about 300mV) and it is prone to overload and distortion.

The final nail in the coffin lid of the receiver is a 2-inch diameter loudspeaker. It’s simply amazing how much better the most modest of receivers will perform with a decent loudspeaker fed by an adequate audio amplifier.

There are many suitable circuits and audio chips about to give the ‘wild waves’ a better chance. In this article I want to offer a couple of suggestions for better audio stages for a receiver.

**Portable Equipment**

Portable equipment has rather a different design criteria from fixed station equipment. By its very nature, portable equipment needs greater power supply economy - the operator has to carry the power.

Ideally an audio amplifier chip for portable equipment ought to have low standby current and yet yield a useful output. Quite often the equipment may be used in a noisy environment so at least 1W of audio output is required.

The SGS TBA820M is an audio amplifier chip that I've used with some success for radio equipment where small size and modest current are required. It's a monolithic audio amplifier in an 8 pin dual-line package with several useful characteristics.

The i.c. is capable of operation over a wide range of voltages, from 3 to 16V. It will yield 1.2W of output at 9V to an 8k load and 2W of output to an 8k load at 12V. The quiescent drain current is low, in the order of 4 to 12mA and it requires few external components.

The circuit diagram in Fig. 1 shows an audio power amplifier using the TBA820M. This circuit is based on the manufacturer's data and I have found these values to work very well. The component count is somewhat more than the more common LM386 but the output and the quality are both better.

The input pin (3) requires a direct resistance to the 0V rail, which could be the volume control but if the amplifier is capacitively coupled the fixed resistance must be included. Pin 2 controls the gain.

A resistance in the range 220 to 820 seems to work well in R4's position. The capacitor on pin 8 could be omitted if space is at a premium. However this capacitor is for ripple rejection and certainly improves the amplifier. The 220pF between pins 1 and 5 is for frequency compensation.

**Fig. 2:** An amplifier project using the TBA820M (see text).
The prototype

The prototype shown in the photograph, Fig. 2, is a TBA820 amplifier built on a p.c.b. It was once part of a home-built transceiver and was removed when the project was pulled apart.

In the photograph, the amplifier is shown mounted on a p.c.b. material base and front panel. The volume control (10kΩ log potentiometer) also forms the load on pin 3.

It would be quite easy to duplicate this circuit on 'perfboard' material or in ugly construction on a pile of scrap p.c.b. material. The layout is not critical but long leads are best avoided as are an unshielded input and output leads.

The amplifier requires a decent sized loudspeaker to use it to advantage. In portable operation I tend to use an external speaker. I hope the PW staff sends the prototype board back to me quickly, as I feel sure it will find its way into other projects!

Fixed Station Use

Building an audio amplifier for fixed station use is a somewhat different undertaking. A bench power supply unit will be available with greater power capacity and the amplifier can be run into a much larger loudspeaker.

There's also an advantage to be gained in using an amplifier that's capable of more power output than will ever be required. An under-run audio amplifier will produce much less distortion and better ripple rejection.

I've found that the TDA2003V/H audio amplifier chip is a good contender and I have used it in several applications. Although it has a cooling tab, a heatsink is not required at the sort of power required in our applications.

The in-car entertainment industry provides several other options. More recently my choice has been the Philips TDA1020 chip. A relatively new device.

The TDA1020 is a monolithic 12W audio amplifier in a 9 pin single-in-line package designed for car radio amplifiers. At a supply of 14V the amplifier can deliver 6W into a 4Ω load at 1% distortion.

Frequency limiting to avoid interference from car ignition systems is built in and the TDA1020 has short circuit and thermal overload protection. The output can be shorted to ground and the chip will not fail. It will work down to 6V and includes a 'load dump' facility which protects the device should the voltage rise about 18V.

The greatest advantage for our sort of application is that the pre-amplifier and the power amplifier are separate. The output from the pre-amplifier and the input to the power amplifier both come out on pins.

The Input Impedance to the preamplifier and the power amplifier are both in the order of 4kΩ and the output impedance of the pre-amplifier is somewhat over 2kΩ. This means that the gain control could be placed between the pre-amplifier and power amplifier. What's more important is that audio tailoring or filtering circuits could also be added between the two sections.

Using the TDA1020

The circuit diagram in Fig. 3, shows a typical audio power amplifier using the TDA1020. The circuit shows that very few external parts are required. Pins 7 and 6 are the connections between the pre-amplifier output and the power amplifier input.

The amplifier can also be run in stand-by mode by making a break at point X in the circuit. With this point open the amplifier only draws about 1mA.

The prototype amplifier shown in the photograph, Fig. 4, is built on Veroboard. It lays out very well in this medium. The only slight quirk is that the decoupling capacitor is mounted under the board.

I connected the prototype board to a heatsink - the front of the 'L' shaped enclosure, but it never got warm in all applications I tested it in! I included p.c.b. pins alongside pins 6 and 7 to facilitate additions between the stages. So far my tests show the TDA 1020 to be an excellent audio amplifier chip for fixed station work. The voltage gain is plenty: 30dB in the preamplifier and 47dB in the power amplifier.

The TDA1020 produces lovely sound into a large loudspeaker. The quiescent current is around 30mA and I think you may see this chip in further G3RJV projects! And perhaps some of yours too?

G3RJV

Practical Wireless, June 1998
Haydon Communications

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Hello again! I hope you all had a good Easter. But now, it's straight down to business. Obviously thinking along the same lines as last time, the Editor came along with the suggestion, "what about devoting June's column to re-publishing a receiver design...there's a lot of reader interest in the idea". Well, I'm game I replied!

After rummaging through a pile of old PWs the Editor and I chose a design by the late F. G. Rayer G30GR, a really prolific author. Entitled '5-Band TRF', the circuit was originally featured on the blueprint included with the December 1966 issue of Practical Wireless.

When the design, the circuit is shown in Fig. 1, was first published there were still many Radio Amateurs using amplitude modulation (a.m.) But a.m. has given way to s.s.b. for voice communication in the amateur bands below 28MHz. The only place where you might still find the odd amateur a.m. transmission is in the 1.8 and 3.5MHz bands (the latter where the specialist vintage military collectors operate).

Whilst it's possible to receive c.w. transmissions by allowing V1 to oscillate in Fig. 1, you should avoid this! Without an r.f. stage to isolate the antenna from the detector the set will radiate -very well indeed if connected to a good antenna.

The Circuit

The diagram, Fig. 1, shows the circuit diagram as it appeared on the 1966 blueprint. It's a fairly standard regenerative detector followed by a simple two-stage audio amplifier.

The detector stage uses the then popular Denco 'Green' range of miniature coils. These were (and still are - see below) available in five frequency ranges.

The three coils most appropriate for this design are:
- Range 2, 615 - 1545kHz
- Range 3, 1.67 - 5.3MHz
- Range 4, 5.0 - 15MHz

The coils are very easy to use being wound on formers that plug into a B9A valve holder.

It is, of course, perfectly possible to wind your own coils but be prepared for a bit of trial and error. The inductance of the tuning winding (between pins 2 and 5) should be around 270µH for range 2, 27µH for range 3 and 3µH for range 4. Out of these, range 4 (5.0 - 15MHz) is the most appropriate for s.w. broadcast listening. That one coil will cover the 49, 41, 31, 25, 22 and 19 metre broadcast bands.

The antenna coupling coil (between pins 8 and 9) needs to have around half the number of turns of the tuning winding and it should be wound over the 'earthy' end of the tuning winding.

The reaction winding (between pins 3 and 4) only needs about 30% of the number of turns of the tuning winding. But this time it should be wound to one side of the other two windings.

When the receiver is operating try reversing the connections to the reaction winding. Leave the connections whichever way gives the smoothest reaction.

The trimmer, TC1, acts as an r.f. attenuator for when signals are very strong. The bandspread capacitor, VC3, can be omitted if either a slow-motion drive is fitted to VC2 or the receiver is only used on the m.w. band (range 2).

Components & Valves

You should have no problem in obtaining components or a 12AT7 valve. The European equivalent of this valve - the ECC81 - was used in valved television sets so try asking...
anyone who has a junk box before buying new.

In contrast, the 6B8T is not particularly common but it is available from regular PW advertiser Langrex Supplies. It's actually a low-noise pentode intended for use in the early stages of high-gain audio amplifiers.

There's only one direct equivalent for the 6B8T as far as I know, and this is the 8DS. The EF80 c.f. pentode, another favourite of TV set designers, is pin-compatible with the 6B8T although its characteristics are significantly different. But, if you have one, by all means try it. The same applies to the EF194.

The output transformer, T1, might well be one of your biggest problems. It ought to have a ratio of 40:1 or more for best results, that's assuming an 8Ω loudspeaker. New valve output transformers are available but can be a little expensive. One source is Savoy Hill Publications - see the classified advertisements at the back of PW.

The audio output transformers that were fitted invalved TV sets are a feature in this receiver. You could also try a scrap television field (frame) output transformer. The turns ratio might not be correct but at least it would be free.

Another alternative would be to use a small mains transformer as the output transformer. Try one with a 240V primary and a 3 or 6V secondary rated at 5VA or more.

Unfortunately, there is a risk that any d.c. flowing in the primary will lower the primary inductance and cause distortion. However, the current passing through V2B is too low for this to be much of a problem.

### Power Supply

The original power supply is shown in Fig. 2. However, any p.s.u. capable of delivering 200-300V at 10mA, plus 6.3V at 0.5A, will work fine.

The mains-transformer choke, Ch, can be replaced by a 2W resistor. Begin with a value of 10Ω and adjust for an h.t. of 250-300V. If you just happen to be knee-deep in surplus television type transformers, you can use the primary winding of either an audio output or field output transformer instead. (Remember to leave the secondary open circuit). Only use real metal rectifiers for MR1 and MR2 if you want authenticity. In all other cases they should be replaced by 1N4007 silicon rectifiers.

The mains transformer, T2, would ideally be a surplus type salvaged from some old equipment. Failing that, Maplin stock a rather generously rated h.t. (with heater winding) transformer, stock code XP27E.

But if you already have a 6V transformer for the valve heaters - even a 3VA type will do - then Maplin's 12VA mains isolation transformer, stock code LW33L, would be a cheaper alternative.

Any transformer that has a single h.t. winding - like the two Maplin types I've mentioned - will need four 1N4007 rectifiers wired in a bridge configuration to give full-wave rectification. However, the h.t. current requirement is so low you can easily get away with half-wave rectification using just one 1N4007. But remember, this will double the ripple voltage across C10 and might lead to more hum on the audio.

Now, this is most important; please put a 1A fuse in series with the on/off switch S1, and put a 100mA time delay type fuse in series with the h.t. secondary. If you use a centre-tapped transformer, as shown in Fig. 2, you can put the fuse in series with the 0V tap. But ideally you should use two 100mA fuses, one in series with each rectifier.

Whatever h.t. transformer you use, you are likely to end up with more than the required 250V h.t. This is due to a combination of the poor regulation of small transformers, the low h.t. current required and the incredible efficiency - compared to high vacuum valve and metal rectifiers - of silicon rectifiers.

If you do find the h.t. is higher than 300V, put a resistor in series with the choke, Ch. Be prepared to try various values and don't use less than 2W types because of the high working voltage that's required in this part of the circuit.

Fortunately, the other resistors are no problem; 5% tolerance, half-watt metal-film or carbon-film types will be perfectly adequate. For example, Maplin's 'Metal Film 0.6W' range. And you can also happily use a standard carbon potentiometer for variable resistor VR1.

### Choice Of Capacitors

Turning to the choice of capacitors now, both C1 and C3 need to be nice. Again, try Maplin's 'High Stability Silvered Disc' range. Maplin don't stock a 200pF component so use 220pF for C3.

Suitable high-voltage electrolytic capacitors are readily available but you'll probably have to use a 10µF capacitor for C10 and a 47µF capacitor for C9. Neither 8µF nor 32 µF are preferred values these days and for safety, keep to 450V types.

The value of the cathode bypass capacitor, C7, isn't critical; anything from 47µF upwards will do. And the 6V working voltage isn't a misprint - it only has a few volts across it.

All the remaining capacitors can either be polyester or polypropylene, even paper. And none of the values are critical. The only thing to watch for is their voltage rating; only use capacitors with a working voltage of 400V or more.

And be sure to thoroughly test junk-box capacitors for capacitance and leakage before using them. Very low leakage is particularly important with regard to C5 and C8, the audio coupling capacitors.

### Best Results

To get best results both VC1 and VR1 need careful adjustment. Initially, set TC1 at maximum capacity and VC1 at half to two-thirds closed. Then increase VR1 from zero until oscillation stops. Now back off VC1 until oscillation stops.

I've found that the best way to adjust this type of regenerative detector is to set VR1 for best demodulated audio quality and use VC1 as the reaction control. With such an arrangement, the audio coupling capacitors.

**Fig. 2: The original power supply - using metal rectifiers. See text for comments and the advised use of modern silicon rectifiers.**

**Choice Of Rectifiers**

**Denco Coils**

Denco coils are once again available. For current pricing and availability contact them at: Denco (Clacton) Limited, 259/265 Old Road, Clacton-on-Sea, Essex CO15 3LW.

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Phil C4JCP takes a look at the work of a prolific PW author from days gone by.
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**Please mention Practical Wireless when replying to advertisements.**

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**YOUR GUIDE TO SECOND-HAND EQUIPMENT**

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**PLEASE MENTION TRADERS’ TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!**

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**The next issue of Practical Wireless is out on 5th September.**
AUSSIE ORACLE

LETTERS AND REQUESTS FOR TOPICS YOU'D LIKE COVERED TO ME PLEASE.

CHRIS EDMONSON VK3CE, BOX 1 YARRA ROAD, WONGA PARK, VICTORIA 3115, AUSTRALIA

E-MAIL: vk3ce@tbsa.com.au

WE WELCOME A NEW COLUMNIST TO 'RADIO SCENE' THIS MONTH IN THE SHAPE OF CHRIS EDMONSON VK3CE.

CHRIS WILL BE WRITING FOR PW ON A QUARTERLY BASIS AND WILL BRING US NEWS AND VIEWS FROM THE AUSTRALIAN AMATEUR'S POINT OF VIEW.

Day from Downunder! I'm writing to you from sunny Australia, an antipodean land where the bands are quiet and the parties are rowdy. I understand it works the other way around 'up there', which may explain why, from my perspective, you all appear to be standing on your heads! My ancestors showed remarkable good sense and migrated here many years ago. However, although she was born here, my grandmother always called England 'home', and instilled in me a great interest and as yet unattained curiosity about 'home', and instilled in me a great

large h.f. antenna to my cat, a thick and heavy 3m or so long black antenna with a spiralized tuning 'wander lead' running half its length and, once out of town, nobody gives it as much as a second look. Try that in Europe!

The bands are relatively quiet here, because there's nothing like the level of Industrial noise and QRM, but there is also far less activity due to the far lower number of amateur operators in this part of the world. Being about as far as you can get from Europe, your signals are pretty well attenuated by the time they get here, all of which means the background noise is very low.

Also Australia has some of the world's toughest regulations for clean emissions and s.s. suppression, which also pays handsome dividends for the radio hobbyist. Every item of electronic equipment sold here these days must comply with savage s.s. constraints, too.

The world's largest island is really quite huge in European terms, but while its people are well dispersed in terms of density per square kilometre and in stark contrast to the figures, most people tend to live in cities on the fertile coast. This means the arid outback is notable for having very, very few permanent residents.

Australia's total population is just over 18 million, and its total amateur licence database extends to just over 18,000 and many of these are repeaters or beacons, or just over 13,000 VK calls in active use (even that is a number which really hasn't grown for many years).

About 5% of our calls are relinquished each year, mainly through death. Happily, almost exactly the same number of new licensees hit the air each year, but the fact remains that there has been no real growth in our numbers for several years. The average age of amateur licensees in this country is now 52 years.

Our representative body, our equivalent of the RSGB, is the Wireless Institute of Australia (WIA), which has been around since 1910. I always try to support the WIA and encourage all VK amateurs to maintain their membership in it, but at a sliding fee scale of up to about Australian $70 per year (around £30 or so), its membership has been in steady decline for many years. Today, the total member base has dropped to below 5000, roughly 26% of licensees, and it continues to drop alarmingly.

In fairness, I should point out that our society's falling membership is a far from unique situation. The RSGB has seen a

collectively have precisely the same voting power as all the WIA members in NSW. Of course, that would be completely fair were there not a small discrepancy in the arithmetic. Neither VK1, nor VK7 (Tasmania) can boast even as many as 200 WIA members, whereas the VK2 and VK3 divisions are many times that size.

Now, I don't know about you, but I believe that amateur operators around the world need effective and regular lobbying at the highest government levels if we are to lose our hard-won privileges. It's so easy for our politicians to be swayed by the slick and professional presentations employed by corporate spectrum-hunters, we must keep our guard up at all times. I don't really believe that we can ever sit back on our exalted status as amateurs. One day all that will change. Look at the recent loss of privileges for amateurs in Guatemala, where the entire 70cm band has been in use for years (430MHz band) band has gone forever.

LUCKY OPERATORS

I have to admit that Australia's Amateur Radio operators are among the luckiest on Earth. Our licence conditions are generous, and our bands more so. In future columns I should be able to make you good and jealous about some aspects of amateur radio in Australia... so why not whip out and join us?!

To start with, anyone can listen to anything they like. Any frequency, any mode, anytime. The sole limitation from a reception point of view is that the country's telecommunications regulations forbid listening to telephone traffic, so cordless and analogue cellular

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Practical Wireless, June 1998
calls are off limits. Anything else, though, go for it! This means the commercial equipment manufacturers give our amateur gear some very wide frequency coverage indeed.

Most of the v.h.f. and u.h.f. transceivers sold here cover literally hundreds of Megahertz on receive. This I find particularly useful for those times when I take advantage of our balmy weather and head off for a walk at two or three in the morning, clutching a hand-held radio!

The quoted specifications rarely reflect what our radios will do and while the sensitivity may drop off as you wander around the spectrum at will, at least we can legally do these things! While we don't have your 4m band (70MHz), our 2m (144MHz) primary allocation is 4MHz wide (144-148MHz) and 70cm-430MHz is a full 30MHz wide (420-450MHz).

**LICENCE GRADES**

Australia has several grades of amateur licence and those in the know can usually tell the various grades based on the call sign allocated. The top level is generally known as the 'full call', which means its holder has passed three examinations, one in each of theory, regulations and Morse Code. The Intermediate licence allows suitably-qualified operators to pass the final test, and Morse is examined at two levels of skill - Morse-qualified Novice operators have access only to restricted parts of 144 and 430MHz for f.m. voice operation. The non-Morse Novice operator has access only to 144 and 430MHz. Are you with me so far? There's one more class of licence and it showed that Australia was prepared to lead the way when, back in 1955, it introduced the world's first code-free amateur licence.

The code-free licence is called the Amateur Operator's Limited Certificate of Proficiency (AOLCP). It allows suitably-qualified operators who have passed the full theory and regulations tests exactly the same privileges as a full call operator, but only on frequencies above 29MHz. So, to summarise, theory is tested in two proficiency levels. There's a Novice-level test or the full call test. The one-level regulations test must be passed by all licence applicants. Morse is examined at two speeds, either 5 or 10 w.p.m. and sending in the test is restricted to a basic hand key only.

When I sat for my licence quite a few years ago, the test was conducted by officials of the Postmaster-General's Department. However, all licence testing these days is conducted by private individuals and organisations on behalf of the WIA Exam Service, which conducts all amateur licence testing on behalf of the government. If anything, testing is more thorough and more carefully observed than ever before, but the service has certainly come in for its fair share of criticism over the years since its formation. It has managed to survive this well and continues its work to a high standard. It's just that there's not enough people coming along to take the tests!

Perhaps it's high time the amateurs of Australia took collective stock of their licence service. We should be managing a nationally generous access to precious spectrum, yet the amateur service is not the flourishing, vibrant and jubilant collection of people it once was. Should we blame the Internet? Perhaps, to a degree. It's very difficult these days to obtain a licence of "wireless" communication the sort of significance that today's computer equipment has in schools.

There were no computers in schools when I was a student and my school had an active Amateur Radio club. What about approaching your local secondary college and introducing the school to the wonders of wireless? It's precisely the program I'm about to start pushing in this country.

I believe that amateurs right around the world need to find new ways to promote this fabulous hobby, to share with the young the very real sense of excitement and accomplishment that Amateur Radio can and should bring!

I'M AFRAID THAT'S ALL I'VE GOT FOR YOU THIS TIME, SO UNTIL SEPTEMBER ALL THE VERY BEST TO YOU AND YOURS. 

73 Chris VK3CE

**VHF REPORT**

**REPORTS & INFORMATION BY THE LAST SUNDAY OF EACH MONTH.**

**DAVID BUTLER G4ASR, YEW TREE COTTAGE, LAUNCESTON, TASMANIA, AUSTRALIA**

TEL: (01873) 860679 E-MAIL: bullerd24boat.bt.com PACKET RADIO: @ G87MAD UK DX CLUSTER: @ G87DXY

**THIS MONTH DAVID BUTLER G4ASR HAS NEWS OF VHF SIGNALS BEING HEARD OVER A 5300KM TROPO PATH AND DISTANCE RECORDS ON THE 2.3 AND 472MHZ BANDS PLUS ALL YOUR USUAL PROPAGATION REPORTS.**

Anyone thinking of attempting the Transatlantic Challenge (the first station to complete a two-way terrestrial contact on the 144MHz band between Europe and North America) should note the following news sent to me by Emil Pocock W3EP.

The Pacific Ocean between the west coast of the USA and Hawaii has for years provided a surface duct (at certain times of the year) which supports contacts on the 144MHz through to 5.6GHz bands at distances of between 3700 to 4330km. There has been good reason to think that these distances could be extended considerably. This speculation has recently been given a huge boost by a report from Shel Remington N6EY on Hawaii.

She has been monitoring the band 8 f.m. broadcast band for several years for signs of stations from the mainland. On February 13, around 0420UTC, he began hearing a Spanish language station on 89.5MHz which he later concluded must be XHME from Jalisco, Mexico. Within an hour, Shel found XHPPV (90.3MHz) also from Jalisco and XHMOZ (92.9MHz) from Manzanillo. These are Pacific coast cities between 5200 and 5400km from Hawaii. These are surely among the longest reports of tropospheric ducting anywhere in the world and the implications of this report are obvious. The next step is to encourage some dedicated v.h.f. operators along the Mexican coast to take advantage of this occurrence of such ducting as this probably is not a one-time event.

I'm not certain if similar climatic conditions exist around the Atlantic Ocean between the UK and Canada/USA but I think it is entirely feasible. After all many UK operators, including myself, have made tropo contacts on the v.h.f. bands to stations in the Canary Islands some 3000km away. (The existing European tropo record on the 144MHz band is held by GM0KAE and EABM1 at 3264km. On the 430MHz band it's with GM1WJH and EABX5 for a 2786km contact and on the 1296MHz band the record is held by G6EUL and EABXS for a contact over a path length of 2617km.)

**TRANSATLANTIC BEACON**

To facilitate the reception of signals across the Atlantic Ocean a number of transatlantic beacon stations have or are in the process of being set up. Those on the European side include EABW8 (L28) on 144.407MHz; OY6VH (IP29) planned for 144.403MHz; ED2WRI on 144.403MHz; EA1VH (IN53) on 144.404MHz; F3AR on 144.403MHz and a planned UK beacon (possibly OY1A) on 144.407MHz. All of these are located on the coast with a clear view of the ocean.

There are not all one-way traffic however. Serge Seppiloge VE1KGG passes the news that Saint Mary's University, Nova Scotia (FN84) is now running a 250W beacon on 144.300MHz. The antenna system consists of 4 x 10-element Yagis, horizontally polarised and vertically stacked on a 20m tower a few hundred metres from the Atlantic Ocean. The use of 144.300MHz will be re-evaluated later in the year.

**EARTH-MOON-EARTH**

Ivo Chladke 26AXT has sent me details of recent earth-moon-earth (e.m.e.) contacts he has made on the 2.3GHz band. In the Dubus/REF contest on March 7th with 5A1WG, FI4AH, HB9SV, I2RT, J4AML, OK1KR, OZ4MM and WS6UA. On March 8 Ivo worked K0ZU/4 in Minnesota and F8N, XH0VA and EZ8L from the Canary Islands. He was also in contact with the UK with 2M1UX, G0DMS and G0VXG.

On March 9 Ivo worked K9CN and W5ZII from the central USA. On March 13, around 0420UTC, he began hearing a Spanish language station on 89.5MHz which he later concluded must be XHME from Jalisco, Mexico. Within an hour, Shel found XHPPV (90.3MHz) also from Jalisco and XHMOZ (92.9MHz) from Manzanillo. These are Pacific coast cities between 5200 and 5400km from Hawaii. These are surely among the longest reports of tropospheric ducting anywhere in the world and the implications of this report are obvious. The next step is to encourage some dedicated v.h.f. operators along the Mexican coast to take advantage of this occurrence of such ducting as this probably is not a one-time event.

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Well done Steve and Roy. Both ways with 55 and 57 reports. F.M. speech signals were exchanged on the path. By 0945 UTC however weak possibly due to lingering mist. 0900 UTC on a clear frosty morning these receive amplifiers actually discovered that the pump source in operation from Charterhouse 47 GHz band for what is believed to be a new UK record. Roy G3FYX worked that this is his fourth band on which occasion with a feed system for the other parts of the world) the e.m.e. (G4KNZ) and 350 mm (G3FYX) were very soon he will be fully in 19 countries! Finally Ivo mentions he has managed to work 25 stations on the 50 MHz band but back-scatter openings on March 10 & 21 were very good allowing DX contacts to be made on the 50 MHz and 144 MHz band. The event on March 10 commenced around 1600 UTC and lasted for over 14 hours. There was also a second weaker phase around midnight. On the 50 MHz band a number of UK operators reported making s.s.b. contacts with stations located in G, GM and GW. Contacts then followed with stations located in G, GM and GW. Contacts were being made from the QTH of GM1ZVI around 110741 was heard making a few c.w. signal into central England. At the QTH of Dick PA3FJY (I032) a total of 14 c.w. contacts were made with stations located in D, L, F, ON OZ and PA. On Saturday March 21 a major geomagnetic storm began shortly after 0900 UTC and lasted for the next 12 hours. The probable cause for this storm was a coronal mass ejection (c.m.e.) which occurred some five days previously on March 16. Activity was first noticed on 49 MHz (Band I television) as early as 1400 UTC but it took nearly an hour before activity levels built up on both the 50 and 144 MHz bands. By 1700 UTC it was all over but by that time a reasonable amount of DX had been worked on both bands. Auroral signals were heard at the QTH of GM1ZVI around 1500 UTC and in the next one and a half hours John contacted 13 stations on the 50 MHz band. John's s.s.b. contacts included LA04HI (I028), ON8MC (I021), SM3EQY (I081), four G stations and six G stations in locator squares I081, I083, I093, JO02 and JO03. John mentions that the DJ3SMK beacon (50.060 MHz) was heard auroral again around 1910 UTC but no other signals were heard at this time. The station of SM3EQY (I081) is situated in an ideal location for auroral openings. At his northerly QTH in central Sweden auroral openings are detected far more frequently and last much longer than events experienced by stations located in central Europe. He first noticed auroral sounding signals on the 50 MHz band at 1300 UTC and then went on to make a s.s.b. contacts with stations located in OH, OHO, OZ, SM and SP. At 1456 UTC he worked his first UK station, G8ECI (I003), signals being 57A both ways. Contacts then followed with G0HC, G3HM, G3SYC, G4FV, G48K, G4FC, G4PD, G40XX, G4EGM, G4YN, G4HCD (his best DX of the event at 1780 miles). GM1ZVI and GW3JWN. In total SM3EQY made 27 s.s.b. QSOs on the 50 MHz band with stations in 11 countries and 21 locator squares. Moving now to the 70 MHz band and your reports show that there was a little DX activity to be found. Stations known to be active during the event included G3NKS (I091), CASEL (I092), GX3WLO (I077) and GW3AWH (I072). The station of GM4WJA (I008) reports that he has recently moved QTH to Dunfermline and has taken the opportunity to upgrade his 50 MHz station. He now uses an Alinco DX-70TH transceiver running 110W e.e.p into a 5-element 9RT Yagi. During the aurora on March 10 he contacted GY1LE (I002), GREQ (I003), G3YOF (I021), GM3WOI (I077) and GM4WJA (I008). Other UK operators known to be active on the 50 MHz band included GD3HAV (I074), GD4UJC (I064), MM4AAM (I075) and GW3GIE (I073). The station of GM4WJA was also active on the 70 MHz band making a number of contacts into central England. Activity on the 144 MHz band was generally restricted to c.w. although the station of G4MK2T (I074) was heard making a few s.s.b. contacts. The best DX reported was probably that of LY2SA (Lithuania) who was putting a good s.s.b. was quite efficient. Apart from two DL and PA stations all s.s.b. contacts were with stations located in G, GM and GW. Towards the end of the event Colin switched back to c.w. to finish off his afternoon's total of 33 contacts in nine countries and 23 locator squares.

**Surge in Activity**

Last time I reported that propagation researchers were predicting a surge in solar activity over the next few months. They had expected to see an up-swing in solar indices corresponding to the beginning of accelerated sunspot growth. Well I can tell you that this has indeed happened and during March the Sun became a lot more active. Because of this, there was a noticeable increase in auroral activity in the UK with events being noted on at least 16 days during March. The DX openings via 12-layer or trans-equatorial propagation (i.e.p.) on the 50 MHz didn't reach into the UK but areas of southern Europe, particularly France, Portugal, Spain and Italy were lucky enough to participate in openings to Africa and South America. Conditions via rapidly moving propagation on the v.h.f., u.h.f. and microwave bands were generally rather poor during March with no extensive openings being noted.

**MicroWave Record**

Now to some news received from Steve Davies G4KNZ. On October 25 1997 the stations of G4KNZ and Roy Emery G3FYX/P worked each other over a 65km path on the 472 MHz band for what is believed to be a new UK record. Roy G3FYX operates from a farm near Wantage (IO81PH) and G4KNZ used a site 1 km south of Hackpen Hill (IO91). Both stations were using 100W Gunn oscillators and diode receive mixers, provided incidentally by myself from surplus parametric amplifiers. I had discovered that the pump source in these receive amplifiers actually worked at 491 MHz and I left it up to the microwave expert to return them down to the 472 MHz amateur band...!

Prime focus dishes of 450 mm (G4KNZ) and 350 mm (G3FYX) were used for the test, alignment of antennas being carried out on the 24 GHz band first. The tests started at 0900 UTC on a clear frosty morning with no wind.

At first the signals were quite weak possibly due to lingering mist on the path. By 0945 UTC however conditions improved and a good 5-meter f.m. speech signal was exchanged both ways with 55 and 57 reports. Well done Steve and Roy.
LU2EQQ (Argentina), P1179C and PSYC2 (Brazil) being worked. The low power beacons PY1AA (SO.032MHz), PY2AA (SO.059MHz) and PY2SFY (SO.010MHz) running 5W into a groundplane antenna were heard on a number of occasions so the band must have been in a really good shape.

The (almost) definitive list of stations contacted in the African continent during March includes FR1GZ (Reunion Island), TRCA, TRICE and TRAXX (Gabon), T8IB (Chali), V51C, V51E and V51KC (Namibia), Z21AP and Z221E (Zimbabwe), 3C1U (Equatorial Guinea), 7Q7L and 7Q7R (Malawi) and 9G1H (Ghana). Strictly speaking these contacts from Europe to TR8, T88, 3C and 9G cannot be t.e.p. as they are all located above the equator.

The propagation may well be some type of E-layer propagation or an ionised scatter mode. The beacons V51VHF, ZDBVHF (Ascension Island) and PY2SDX were also heard on a number of occasions.

Contact was also made with stations situated in South Africa, the most active of these being ZR8VE, ZS6XT, ZS6BTE, ZSDN, ZS6PS, ZSHB and Z3IEX. However, not all stations situated south of the UK were able to work the DX in southern fringe. Some stations are located on the southerly fringe of the t.e.p. zone in similar circumstances to the UK which is located on the northern fringe.

Shawn ZR1VEY (JF96) reports that whilst operators in the Z56 call area have been enjoying some spectacular openings to Europe, those in the Z51 call area (approximately 1700km further south) have only been listening to white noise. Occasionally he has heard bursts of c.w. and s.s.b. signals on 50.110MHz but signals have always been very weak and no positive identification could be made.

Recently Shawn installed a tape recorder to monitor various frequencies in the 50MHz band. On March 14 he set the receiver to 50.040MHz leaving it on during the afternoon. On re-winding the tape he was surprised to identify a short burst of signal from the Z51S5S beacon. Shawn was really pleased as this was the first time he had heard anything further than 1700km since 1991.

In my opinion you should make a note of all the callsigns just mentioned as I'm sure UK operators will be working them during the next reguclar periods in October 1998 and March 1999. I kid you not!

**CONTEST ACTIVITY**

Now I'll turn to your reports of the 144/430MHz contest held over the weekend of 13th/14th March. David Dodd DDG4WLL (RO1S) reports that conditions at his QTH were quite poor on the 144MHz band.

In total David made 61 contacts, well down on what he had hoped for. David uses a Trio TR9130 transceiver, a Tokyo 100W amplifier, a Spectrum masthead pre-amplifier and an 8-element Yagi at 6m above ground level. His best DX of the contest was ON50GRC (J010) at 775km.

Other DX contacts included ON1DQ (J011), G7RAL and MI1BWR (both in JO90), G3YVR and G0FOA (in JO91) and G4PQG (J031). He also pleased to work G3LBQ (P400) and G3P3DN (IO64). David mentions that he was surprised to hear the P1179C beacon at good strength only ten minutes after the contest had ended!

On the 430MHz band David used a Belcom Liner 430 transceiver running 4W into a 24-element Yagi at 5m above ground. Not surprisingly his best DX was only to G4KUX (IO94) at 140km but several Midland stations did report hearing G4WML peaking 2W. Obviously receiver technology has moved on a long way since the Liner 430 was first built in the early 1970s.

No recent letter from Scotland and this one is from Jim Martin MM1BJU. Jim has spent a lot of time recently upgrading his portable 430MHz system, the biggest addition being a 20m trailer mounted tower.

Some are the days when putting up antennas meant using scaffolding poles, ropes, gin poles and a lot of luck! Now all it takes is to extend the trailer legs, fix the antennas to the stub mast and have the cables and wind-up the tower. All very safe and easy.

Jim reports that conditions on the contest weekend were not good with high winds and roads blocked by snow. Despite this he still used his usual contest site on Mainland Light (IO65). For the contest MM1BJU used an Icom IC-290 transceiver with 24W to a 13-element Cushcraft Yagi. Conditions on this band were very quiet with only 12 s.s.b. contacts being made, the best DX on this band being G0HNN (IO94) at 229km.

That's it again for another month. Don't forget that the PW-144/430MHz contest is being held between 0900-1600UTC on Sunday June 21. Rules are unchanged from recent years and can be found elsewhere in this issue. Please forward any news, views, comments or photographs of your activities to the address and by the date given at the top of the column.

**THANK YOU FOR YOUR LETTERS AND GOOD LUCK WITH THE VHF DX FOR YOU AGAIN NEXT MONTH.**

73, David G4ASR

Leighton GW0LBI provided Frank DL3ECK with his first 1.8MHz c.w. QSO.

**HF FAR & WIDE**

**REPORTS & INFORMATION (AND PHOTOGRAPHS) BY THE 13TH OF EACH MONTH PLEASE.**

**LEIGHTON SMART GW0LBI, 33 NANT GWYN, TRELIWS. MID-GLMORGAN CF46 6DB, WALES**

**TEL: (01443) 710749 (9AM - 6PM)**

**FAX: (01443) 710789 (9AM - 6PM)**

**LEIGHTON REPORTS THAT MARCH SAW GOOD CONDITIONS ON ALL OF THE HIGH FREQUENCY BANDS. THE 21, 24, AND 28MHz BANDS SUPPORTED RELIABLE LONG DISTANCE CONTACTS THROUGHOUT, ACCORDING TO OUR INDEPENDENT REPORTERS.**

Welcome to 'HF Far & Wide' and down here in South Wales I've been monitoring the 28MHz band. In particular over the past four weeks, and have logged most parts of the world coming in at varying signal strengths on almost every day. Perhaps the month of May is the time to get out into the gardens and sort out the antenna farm. Or, as in my case, the antenna allotment! Whatever the case, it seems that propagation conditions are improving steadily, and with good conditions prevailing, even amateurs with modest antennas such as wire dipoles and verticals will be able to work the DX on a regular basis.

**LANKAWI ISLAND EXPEDITION**

Some news came in via a telephone call from Johnny Melvin G3LIU of his trip to Lankawi Island, Malaysia. "14MHz has been staying open around 2000. While operating between 2000 and 2300UTC. Johnny says that he'll be operating on the 14, 18 and 21MHz bands "as long as I can find a friendly tree!" He also states that it's not a 'multi-multi station,' just him and a few watts of c.w.

Johnny will be on Lankawi between the 5 and 13th of June and would appreciate UK stations listening for him there and giving him a call. He would also like to thank Yasu, who have agreed to be co-sponsors of the special QSL card for the expedition.

**YOUR REPORTS**

Space is at a premium this month, so I'll start with the 7MHz band. A warm welcome back to Eric Masters G0KRT of Worcester Park, Surrey, who had been busy working the DX on the band. His log for March shows SW c.w. contacts with K1CR, N2MU and W3LP in the USA between 2000 and 2300UTC. Meanwhile, on the Isle of Sheppey in Kent, Ted Trowell G2YKU lists c.w. contacts with the rare 9W0C (Spanish Islands), 8P5B (Barbados) and 5B4AGC (Cyprus) at around 2000. While operating slightly later at 2200UTC brought in 5B4AGC (Antha Island).

New 'old time' reporter Angie Sitton G0HCA of Stevenage offers a long log of which I can squeeze in but a short selection. Using a 3m long wire antenna and 100W of c.w., she worked 8P5B (Barbados) at 2047, W1B08 (Texas) at 0700 and 9D8RAO (Australasian Russia) at 2327.

Welcome back to 'HF Far & Wide', Angie!

**PROGRESSION REPORT**

In his monthly propagation report, Don McLean G3NOF of Yeovil says that "Conditions have been good on both 3.5 and 7MHz this month with most parts of the globe being heard. '14MHz has been staying open until 2200 as we get the longer daylight hours, and I found conditions to the West Indies and south America very good in the evenings. '18MHz has been patchy this month, although it has been open around 0800 on the long path to Australia and New Zealand, then changing to short path at 1000 until 1200.

'21MHz, north Americans were often heard strongly between 1200 and 1900. Africans came in during the afternoons, with south Americans during the evenings. '28MHz showed some regular, if
THE 14MHz BAND

Don G3NOF’s 14MHz band log for March shows 14MHz s.s.b. contacts with FG9GC (Guadeloupe) QSL via F6OZU, F4AUUY (Aruba Islands), V44NEF (St. Kitts Island), and BV4OC (Spratly Island).

For his 14MHz log s.w.l. Derek Blunden BRS 171057 in Swindon lists a s.s.b. reception of V23P (Antigua Island), JB9BKW (Japan) at 0825, 9H1DF (Malta) at 1350, VE3HIF at 1403, and VB3NAX (India) at 1634 UTC.

Down in Skewen, West Glamorgan, comes Carl Mason GW9HSW, who’s been QRP-ing on 14MHz this month. His log shows 5W c.w. contacts with PY2CJ (Brazil) at 0948, EA2DX7L (Canary Islands) at 1537, L79HPF (Argentina) at 2157, while 4W of s.s.b. brought in LA2NC in Oslo, Norway at 1333 UTC.

Another gigantic log again this month from Sean Gilbert GA4UCJ in Milton Keynes. Using two power levels of 5 and 25W, he lists c.w. contacts with HF/Pol (South Shetland Islands) at 1947, KR8VCa (Bamah) at 2038, W6AX (California) at 1548, KC42K (Guantanamo Bay) at 2057. Then he logged EP9WKC (Iran) at 1630, VK4NM (Australia) at 0839, 6W9XJ (Senegal) at 2019, and finally a two-way 3W contact with ZL3OX (New Zealand) at 0717 UTC. Editorial comment: Congratulations Sean - how many ‘miles per watt is that? Editor.

THE 28MHz BAND

Finally for this month, let’s take a brief peep at the 28MHz band, dear old ‘10 metres’. Jon Wheeler G0UIE in Melksham tells me that he has tried to 28MHz this month, and using around 100W and a 2-element beam antenna worked YUZTE (India) on 28MHz f.m., while he brought in contacts with VPRJXK (Falkland Islands), 9X0A (Kwangsi), CX15PC (Uruguay), TT8IWM (Chad), along with Z54L and Z58XK (South Africa).

Jon also hooked up with local Novice Trevor Z0AII, who was busy working the DX with his 3W. Trevor mentioned that it was hard work with just the 3W, but hoped the Radiocommunications Agency would increase the allotted power soon. Quite right too, Trevor!

SIGNING-OFF

Well that’s about it around this time! Thanks for your support for the column and your patience! Keep up the good work, and good luck with that DX!

THE 18 & 21MHz BAND

The 18 and 21MHz bands are where Charlie Blake MOAIJ of Milton Keynes usually ‘hangs out’ nowadays on the air. His log shows s.s.b. contacts on 18MHz with E9AE2 (Cecuta) at 1018, 7TTM (Republic of San Marino) at 1233, and 5V2CWVY (Greece) at 1409 UTC. Tuning up to 21MHz brought Charlie Q5V with 4X1MI (Istres) at 1116, DZAI (Angola) at 1632 (QSL via CT1EGB), and 9K2G4GQN, part of the NBC news crew (QSL via N4UJ).

Don G3NOF lists his s.s.b. contacts on the 18MHz band with A92CG (Bahrain) QSL via Box 1976, Manango CV6U (Taiwan), S2API (Libya) QSL via N4AAPS, and JB9BFW (St. Lucia).

Angie G2HCA suffered a ‘potato’ in BV7FCT in Taiwan on 21MHz (better luck next time), while Ted G2HKU did well on the same band with his c.w. reaching out to NA1T (Mexico), VQ5RC (Chagos Islands), Z2NE (Cayman Islands), 9G5XA (otherwise known as G3AXQ in Ghana), and VU2LIT (India), all around 1000 UTC.

Focal Point

REPORTS & INFORMATION TO ME PLEASE.

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GRAHAM HANKINS G8EMX

SUMMER IS HERE, BRINGING WITH IT FINE WEATHER (I HOPE) AND AMATEUR TELEVISION CONTESTS.

FACED AND PORTABLE AMATEUR TELEVISION (ATV) STATIONS CAN BE OPERATING WITHIN THE ALLOCATED PARTS OF THE AVAILABLE BANDS - 430MHz, 1.2GHz, 3GHz, 10GHz, and 24GHz.

THE MAIN OBJECT OF AN ATV CONTEST IS TO ENCOURAGE DIRECT STATION-TO-STATION CONTACTS, SO ATV OPERATORS MUST NOT USE A CONTEST EXCHANGE SYSTEM. FIXED STATIONS TO STATION OPERATORS AT THEIR PERMANENT ADDRESS WILL BE NOTING THEIR DIRECTIONAL ANTENNAS TO SEEK OUT PICTURES FROM EVERY POINT ON THE COMPASS, BUT AS A HOUSE CANNOT BE MOVED TO HIGHER GROUND FOR MORE Distant contacts, so the real adventure is to be found in operating portable.

A PORTABLE STATION IS DEFINED AS ONE NOT LOCATED IN A PERMANENT BUILDING, SO VEHICLES, CARAVANS BECOME ATV STUDIOS FOR THE DURATION. ANTENNAS CANNOT BE SUPPORTED FROM A PERMANENT STRUCTURE, BUT THOSE GUY WIRES TO THE MAST HAVE TO BE ATTACHED TO AT LEAST ONE CAMERA!

It is becoming commonplace and a cause for concern in some circles, that many ATV contest stations do not take a video camera with them. This may appear a contradiction in terms but how can you have an ATV exchange without a camera?

Well, the exchange itself consists of the transmission, in four, of a four-digit number which the receiving station has to resolve and identify. Contest rules specify how this number is chosen, but the digits can be computer-generated or come from an EPR0M. This is often more economical in 12V power (remember those batteries?) than a written card in front of a camera lens.

Antennas used by Graham Hankins G8EMX for portable ATV contests. From top: 24, 70cm and 2m for ATV calling. Note: even the 2m antenna is mounted horizontally. Larger antennas would be preferable.

CONTEST WORKING

Contest working with ATV has a more relaxed pace than with telephony alone. There are fewer stations to be worked, so after the ‘formal’ part is over and a score has been achieved time can be spent, arguably should be spent, sending ‘live’ pictures from a camera.

Indeed, there are some opinions that ‘live’ pictures should form a part of the scoring procedure.

AMATEUR TELEVISION CONTESTS START AT 1800UTC ON A SATURDAY, FINISHING AT 2200UTC ON A SUNDAY. THE PROCEDURE IS THAT CONTESTANTS CALL ‘CQ ATV CONTEST’ ON THE 2m BAND. ATV CALLING CHANNEL 144.750MHz. IF THAT CALL IS RETURNED, ANNAUS MAY BE ROTATED TO PEAK UP THAT 2M PATH BEFORE ATTEMPTING A 70CM OR 24CM VISION CONTACT, BECAUSE ALL ANTENNAS ARE, OF COURSE, ON A COMMON MAINTENANCE.

THE STATIONS THEN AGREE WHO WILL TRANSMIT THE ‘INDEX’ MESSAGE AND A CORRECTLY IDENTIFIED NUMBER COUNTS AS A ‘SCORE’ FOR THE CONTEST LOG, WITH DISTANCE AND BAND MULTIPLIERS AS DETERMINED BY THE RULES. FULL INFORMATION, LOGSHEETS AND ATV CONTEST RULES CAN BE OBTAINED FROM...
Richard Guttridge G4YTV, Ivy House, Rise Road, Skirlaugh, Hull, East Yorkshire, HU11 5BH or E-mail via g4ytv@vadic.com

Contests for ATV enthusiasts in 1998 include the International (September 12/13) and Autumn Vision (November 14/15). But the weekend is the Summer Fun which takes place during the weekend June 13 to 14.

I plan to join this contest, with 70cm and 24cm ATV using my caravan from the local 'high spot' in the Midlands. Maybe some readers of 'Focal Point' will be around in vision, perhaps?

REPEATER NEWS

Dave Webster G6SKO is keeper of the Nottingham 24cm ATV repeater GB3NV and Harold Bent GOEZW was a regular user. Unfortunately the repeater lost its original site at Mapperley Plains because the antenna's position on the mast was needed for commercial services.

Harold writes: "GB3NV is presently transmitting in beacon mode from its new site at Watnall, but will resume full repeater operation when a new logic unit has been completed. The old Allford-Atom antenna has been improved, thanks to some handy machining by Dave".

Harold GOEZW weds the GB3NV repeater because working simplex ATV from his home station is difficult. So, when 'NV lost its old site and was off air, he took his ATV gear out portable. Harold says: "I set up a portable location near Junction 27 of the M1, with a rebuilt Quad-Loop antenna. ATV stations worked included PS pictures to G7SLC near Loughborough and PS to V vision to Fred G4CJN in Nottingham."

Now to Birmingham, where Alan Kendal GW6WI (Stourbridge) is chairman of the Beacons Repeater Group (BRG). The group has submitted an application for a 10GHz repeater at Sedgley, meanwhile a dual Allford-Atom antenna has been received by GB4X (Blackwood, south Wales) for use in the BRG's 1.3GHz repeater, which will be sited just a few miles north of central Birmingham.

The dual Allford antenna for north Birmingham has been bought from an antenna manufacturer. Several ATV groups with workshop facilities available have successfully made their own, but the design can be difficult to reproduce so I look to the 'easy option' here. Coverage testing from the site will begin soon, as an attended 'P' exercise with my own callsign of course.

THAT'S ALL FOR THIS MONTH SO, CHEERIO FOR NOW, KEEP SENDING ME THAT ATV NEWS, FROM WHEREEVER YOU MAY BE.

73 Graham G8EMX

RADIO 'SCAPE

REPORTS & INFORMATION TO ME PLEASE.

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E-MAIL: mike.elaine@binternet.com

WEB SITE: http://www.binternet.com/~mikespage

THIS MONTH MIKE RICHARDS G4WNC LOOKS AT WEB PAGE CONSTRUCTION AS WELL AS REPORTING ON A NEW ACARS DECODING PROGRAM.

I'm sure you've all heard the Internet hype that claims that every family will have their own Web page by the year 2000. And if you've ever taken a detailed look at the construction of a Web page you could be forgiven for being a bit daunted by the task. So, in this short introduction I'll try and give you a practical introduction, along with a few tips and tricks on how to build your own Web page.

Let's start with a brief look at HTML, although you don't have to worry too much about this as I'll show you how to build a Web page with absolutely no knowledge of HTML.

So, what on earth is HTML? Well it's an acronym for Hyper-Text Mark-up Language. This is really very much like the macro language that's built-in to most modern word processors.

The system lets you enter codes and more sophisticated commands so that you can change the layout or format of the document part way through. The most simple examples being the ability to show part of the document in bold type or font change. You will note however, that when you do change the formatting in this way all you see on the screen is the change to the text. However, if you were to look at the document with a simple text editor you would find that a code had been inserted at the beginning and end of the section with the bold type or font change.

Exactly the same principle is used to handle Web pages but here the system of codes used to control the way the document behaves is called Hyper-Text Mark-up Language or HTML. If you want to see just what HTML looks like, log on to the 'Net and load a Web page.

If you are using Netscape Navigator go to the menu and select View Document Source. This will open-up a new window with the full details of the page you are viewing. You will find that the page probably looks very complicated rather like the example of my page that I've shown in Fig. 1. What you can see now is the original text plus all the HTML codes that are used to control the way the page looks.

You're probably beginning to think that building your own Web page is purely for computer anoraks! Don't worry, there's help at hand!

BUILD YOUR WEB PAGE

By far the easiest way to build your first Web page is to use what's known as a WYSIWYG Web type editor. The WYSIWYG bit is just jargon for 'What You See Is What You Get', well it's an acronym for Hyper-Text Mark-up Language. This is really very much like the macro language that's built-in to most modern word processors.

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This is available as a freeware version on the Web at http://www.sq.com Whilst I personally don't think it's in the same league as Navigator Gold it's still relatively easy to use.

Another program well worth a look is WebWizard by AKTA. This can be found at http://www.sq.com/webwizard and offers a wizard style of constructing a basic Web page complete with graphics, etc. While WebWizard is very convenient, it does lack the flexibility required to make your page a bit different from the norm.

If you want to get really serious then the editor to go for at the moment is HotDog Pro. This is also available on the Web at http://ftp.sausage.com/pub/hotdog.

Don't worry, there's help at hand! A recent check of the Netscape Web site shows that the old Navigator Gold is still available as version 3.04 from their archive site at http://archive.netscape.com/archive/index.html. This is available as a freeware version on the Web at http://www.sq.com Whilst I personally don't think it's in the same league as Navigator Gold it's still relatively easy to use.

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information can be seen or found from the main page. You will find that you really have to put some thought into keeping the information to a minimum or the screen will very quickly get cluttered.

Let's just divert here and see how a typical page is put together. To put some life into it I'm using the latest version of my Home page (http://www.bbtinternet.com/~mikes page) as an example.

Rather than being just one document, the page is actually made-up from several files that are combined by the Web browser to make the image that you see on your screen. Just to show you how this works on my page, here are the component files along with an explanation of what their used for:

Index.htm: This is the main HTML document that contains the necessary code to bring all the files together. It's common practice to shorten the file extension to.htm because DOS only supports 3 character file extensions.

orange.gif: This is a small graphics file with the orange blob used for the start of each line of text.

mainbgd.gif: This is another small graphics file that contains the background image for the page. Although this is only a small file, the Web browser fills the page by making internal copies of the pattern and displaying them as if they were one image.

offers.htm, question.htm and hot.htm are simply other pages on my site.

wsgraph.txt, hell.zip, hs_v610.zip and raft201.zip are all program files that can be accessed via my offers.htm page.

Now, what about all those fancy graphics you see on the Web? Most new HTML authors become extremely daunted by the thought of having to create all their own graphics.

Don't worry, it's common practice to pinch designs from other Web pages! The nature of Web browsing makes this very easy as every time you view a Web page you download all the graphics. All you have to do is decide which bits you want to use and save them to your hard disk.

Let me take you through the way to do this using Netscape Navigator. The process is very similar in other browsers.

First you find a Web page that has either a graphic or a background that you rather like. You then view the page and move your mouse pointer to the graphic you want.

Then just press the right mouse button and you should be presented with a menu of options. The two you need to concentrate on are 'Save Image as...' and 'Save background as...'. These are fairly self explanatory and just let you choose a file name and location for the selected images. It really is as easy as that.

PAGE DESIGN

Let's take a look at a few do's and don'ts for good Web page design.

Probably the most common error made by new authors is to over complicate the page and insert too many graphics. Whilst graphics can certainly add character to a page, there is one big disadvantage. Any decent graphic usually ends-up as a fairly large file. Remembering that all the components of the many images to be downloaded, you can see that adding large graphics to your page can make it very slow to load.

If the link to your site is on the busy side (often the case with free home page servers) you may find people give-up before your page has downloaded which rather defeats the whole object! So remember, keep it small and quick.

Now just a few more tips that will make life easier for your 'readers'. Make sure you date your page and use the unambiguous January 6 1998 format rather than the lazy 6/1/98 which could be January 6 or June 1 depending on where you live!

It's also a good idea to put your E-mail address clearly on all your pages so people can get hold of you. The easiest way to do this is with what's known as a 'mailto:' link.

You will see the mailto link as follows: you will find that it has special characters which client with your E-mail address. It's also a good idea to put your E-mail address clearly on all the pages so people can get hold of you. The easiest way to do this is with what's known as a 'mailto:' link. You will see the mailto link as follows:

name, directory and password details. Once this is complete, pressing the Publish button starts an automatic upload to your Web site. Using this system really does make it very easy to update your pages.

That about concludes this introduction to building your own Web page. If you decide to have a go why not send me your Web address so I can pass it onto other readers?

NEW DECODING PROGRAM

I know it's not really Amateur Radio but I know lots of you like to have a dabble on the air bands from time to time so I thought you might like to know about the latest Aircraft Communications Addressing and Reporting System (ACARS) decoding program. Those with an interest in RTTY will no doubt be familiar with Hamcom, well the author (Wilhelm Schroeder) has just completed developing a brand new ACARS program.

The ACARS program is called Sky Spy and is currently being handled in the UK by Pentisell. Before I talk you through the program here's just a brief introduction to ACARS.

The ACARS system is rather like a Packet radio network for aircraft. Each aircraft and base station has a unique identifier and all the signals are sent on a limited number of frequencies. If you want to have a
listen, the busiest frequency in the UK is 131.725MHz using a.m. - as is common practice on the air bands.

So what's it used for? Because the ACARS system lends itself so well to automation it gets used primarily to handle all manner of routine traffic between the aircraft and various interested parties on the ground. This could range from the airline wanting to know how much fuel the plane is burning through to ground control requesting a weather report.

Because the on-board equipment is so sophisticated ground crews can now interrogate the control system of an aircraft to find out how it's doing without having to bother the air crew. As you can see it's a very sophisticated system.

A CASARS uses a fairly basic data transmission protocol: it's quite a simple process to monitor and decode these messages. However, in order to make sense of some of the coded mesagengey system you do need some sort of decoding software. This is where the ACARSe programs come in to their own as they usually combine a basic reception system with some fairly sophisticated sorting to bring the data to life.

SkySpy is a brand new Windows '95 based ACARS program that features a decoding system along with some very good logging and filtering systems to make sense of all that data. Being a Windows '95 based installation it's extremely simple and the first time you run the program you will need to enter the encryption key. Once it's up and running you just connect your Hamcomms to the appropriate COM port, tune your radio and you're ready to start decoding. Because ACARS signals occur intermittently, it is common practice for experienced listeners to just store the data into a log file and review it later.

SkySpy makes creating log files very easy and even adds a unique filename so you don't have to bother! Once you have a log file you can really start to use SkySpy's filtering and sorting options features to bring the data to life.

An added bonus is SkySpy's uses of the Microsoft Access database format. This means that providing you have access to this program you can carry out some really powerful data processing.

One of the really great things about SkySpy is its price, Pervisel are selling a complete system at just £24.99, which represents really excellent value for money. For more information contact Pervisel on (01949) 443033 or via their Website at http://www.pervisel.com

SPECIAL OFFERS
If you'd like a copy of Hamcomms/VFAX, 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, Winciscombe House, Beacon Road, Crowborough, Sussex TN6 1UL Tel: (01892) 66 3299 and request library volume 89027-Paldecl.

The software is only available as a set of five disks as follows: IBM PC Software (1.44Mb disk): Disk A - VFAX 7.1, HAMCOMM 3.1 and WFXAN 3.2; Disk B - DSP Starter plus Texas device selection software; Disk C - NuMorse 1.3; Disk D - UltraFAX 4.0 and Disk E - Micmoc 1.3 and 2.0.

THAT'S ALL FOR THIS TIME, SO UNTIL NEXT MONTH CHEERIO AND DON'T FORGET TO KEEP YOUR LETTERS AND NEWS COMING IN, PLEASE USE THE ADDRESS AT THE HEAD OF THE COLUMN.

73 MILE GAWNC

BROADCAST

REPORTS & INFORMATION TO ME PLEASE.

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A NEW INTERNATIONAL BROADCASTER IS ON THE SHORT WAVE BANDS, PETER SHORE REVEALS ALL.

The final day of March was marked by the last broadcast in a foreign language - at least for the time being - from Portugal. Radiofisso Portuguese, based in Lisbon, has transmitted English programmes since 1955 and French since 1962. Radio Portugal has used the same frequencies year in year out to reach listeners in Europe with a 30-minute programme each evening, with variable reception from eight elderly transmitters, seven rated at 100 and one at 300W. These are now being used solely for the Portuguese-language programmes which are on-air throughout the day for listeners worldwide. The same week as that on-air stream closed, a new 'continental-wide' station was unveiled by US President Clinton. During the final days of his African tour, Clinton made the surprise announcement that Radio Democracy for Africa would come on stream in July 1998. The new station will broadcast in nine languages to 19 countries and the range of output means considerable overlap with existing Voice of America (VoA) broadcasts to Africa.

As this edition of PW goes to press details are sketchy. But it is believed that the new station will be part of the Voice of America station, concentrating however on different aspects of broadcasting (such as lifestyle programmes for refugees) but following the same VoA editorial charter.

NEW BROADCASTER

On 28th March anyone turning around would have heard a new international broadcaster on the short wave bands. Merlin Network One celebrated the first anniversary of the management buy-out company that now controls all the World BBC Service UK transmitters and operates the overseas sites (which are still owned by the BBC).

A 24 hour transmission was carried on short wave from the Merlin sites at Rampsham in Dorset and Skelton in Cumbria plus satellite relay on the Astra satellite across Europe. The programmes were put together at Country Music Radio's studios in London, and included output from Radio Caroline plus a specialist communications programme called Media Zoo.

Unfortunately, Merlin only announced a little over one week before the event. This meant that I couldn't bring you news in advance. However, Merlin is now trialling a weekly programme stream - also branded Merlin Network One - which can be heard in Europe on Wednesday: 1700-1900 on 15.20; 1900-2100 on 15.59; 2100-2200 on 15.885MHz.

FREQUENCY NEWS

Some more frequency news now.

Israel Radio has English: 0400-0415 on 9.435, 11.605 and 17.335MHz; 1030-1035 on 15.64 and 15.65MHz; 1400-1430 on 12.535 and 15.64MHz; 1545-1555 on 11.605, 15.65 and 17.335MHz; 1900-1925 on 9.435, 11.605, 15.64 and 15.65MHz.

Swiss Radio International in English via short wave in Europe is at: 0400-0430 and 0330-0800 on 5.84 and 6.165MHz; 1000-1030 and 1200-1230 on 6.165 and 9.533MHz and 1900-1930 on 6.165 and 9.885MHz.

Neighbouring Austria has programmes in English at: 0400-0430 and 0330-0800 on 11.98; 2100-2200 on 5.945 and 6.155MHz.

Further north, Radio Sweden is on the air during the European evenings: 1730-1800 Monday-Saturday on 6.065 and 15.735MHz plus 17.945 MHz medium wave; 1730-1800 Sundays on 13.855 and 15.735MHz; 1930-2000 on 6.065MHz and 17.965MHz short wave; 2030-2100 on Saturday and Sunday on 6.065 and 13.83MHz plus 17.945MHz medium wave; 2130-
2200 on 6.065 and 9.43MHz plus 1179kHz medium wave.

RADIO CHINA

A letter from John Noble G-20%1, in Rainham, Kent, tells me that he has received a letter from Radio China enclosing an entry form for a seven question competition on Macao and Hong Kong. With it they supply a covering sheet that gives all the answers. Six winners will have an expenses-paid trip to Beijing and Macao and he thinks the whole thing seems to be merely a con-trick to encourage people to listen and write to China.

An interesting point, John. Most of the contests which China Radio International (CRI) has run over the past couple of years have adopted the same technique. It makes me wonder whether CRI is worried that no one can actually manage to find the station on the short wave dial, particularly because of the interesting choice of frequencies they make.

You can listen to CRI in English in Europe: 2000-2100 on 5.22, 6.95, 7.16, 9.44, 9.635 and 9.92MHz; 2100-2130 on 5.22, 6.95, 7.17, 7.18, 9.535, 9.67 and 9.92MHz; 2100-2130 on 3.985MHz via Switzerland and 2200-2300 on 7.17MHz.

John has also been in contact with the Islamic Republic of Iran Broadcasting (IRIB) station in Tehran. English is on the air to Europe at 1930-2030 on 7.16, 7.26 and 9.022MHz. The most notable point about IRIB for John, however, is the station's idea of collecting QSL cards. The station will issue a QSL for a listener's first correct report, and then issue further cards for greater numbers of reports. For example, to gain eight QSL cards you will need to submit no fewer than 140 reports, and to gain a third degree diploma, you have to send in 250 reports. When you get to 500 reports you will become a member of the IRIB DX Club, complete with a certificate of membership. In the meantime, at your 200th and 500th report, you will be given some precious gifts according to the IRIB blurb.

"I don't know what IRIB are thinking of but it would take years to complete and cost a fortune in IRCs and postage," bemoans John. Thanks for your letter, and do let me know if you make any progress towards membership of the IRIB DX Club. Of course if any PW reader has managed to join, please let me know!

WITH THAT SOBERING THOUGHT I'LL SIGN OFF. UNTIL NEXT MONTH, KEEP TUNING ACROSS THE SHORT WAVE BANDS.

GOOD LISTENING, PETER.

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The following is a list of local dealers who currently stock Practical Wireless. If you can't find it in on display in their showrooms please ask. If your local dealer doesn't stock PW why not ask them to call Michael Hurst, PW Book Store on (01202) 659930 to find out how to order copies?

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50 channel hand-held PRO-70 scanner, excellent condition, £90. N/Cads and new, boxed, battery pack, £60. Instruction manual, v.h.f./u.m.f., service manual, £10. AV meter, D brokerage. £50. Trimble Yaesu FT-900AT, £115. Tel Cheltenham 101242)67532. Battery case, d.c. power lead, car charger, £25. Tel: (017451 857119, E-mail: tasman.tn-bander, £275. G3BVVY extension, £350. Hygain TH5 5-MHz rotator, various spares, two new condenser packs, instruction manual, vhf.

80m length of Popes HF-100 coax, £465, good condition. Band II 5-element Target receiver, £80. Both very good condition. Heathkit GHF-100 2kHz-30MHz, £1,115, no offers. Barry 01902149621 any day or mobile anytime.

得很忙，无法参加聚会。是的，朋友会去参加，但是，我不能参加。这是一个很好的机会去参加一个聚会，但
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